

September 30, 2022

Ms. Eileen White
Executive Officer
San Francisco Bay Regional Water Quality Control Board
1515 Clay Street, Suite 1400
Oakland, CA 94612

SUBJECT: SUBMITTAL OF THE SAN MATEO COUNTYWIDE WATER POLLUTION PREVENTION PROGRAM'S FY 2021/22 ANNUAL REPORT

Dear Ms. White:

The San Mateo Countywide Water Pollution Prevention Program (SMCWPPP), a program of the City/County Association of Governments of San Mateo County (C/CAG), is pleased to submit the attached Fiscal Year 2021/22 Annual Report. This report describes Municipal Regional Permit (MRP) compliance activities conducted at the regional and countywide levels on behalf of San Mateo County municipalities. It also incorporates by reference and includes as appendices three reports prepared via the Bay Area Municipal Stormwater Collaborative (BAMSC) on behalf of all Bay Area MRP Permittees.

I certify under penalty of law that the SMCWPPP FY 2021/22 Annual Report was prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted. Based on my enquiry of the person or persons who manage the system, or those directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

SMCWPPP and the 22 municipal agencies in San Mateo County look forward to continuing to work with you and your staff on implementation of the MRP. If you have any questions or comments, please email me at rbogert@smcgov.org.

Sincerely,



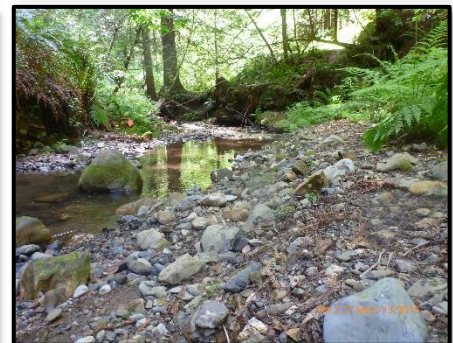
Reid Bogert
Senior Program Specialist

Attachment: SMCWPPP FY 2021/22 Annual Report



SAN MATEO COUNTYWIDE
**Water Pollution
Prevention Program**
Clean Water. Healthy Community.
www.flowstobay.org

FY 2021/2022 Annual Report



September 30, 2022

Credits

This report is being submitted by the participating agencies in the



Town of Atherton

City of Belmont

City of Brisbane

City of Burlingame

Town of Colma

City of Daly City

City of East Palo Alto

City of Foster City

City of Half Moon Bay

Town of Hillsborough

City of Menlo Park

City of Millbrae

City of Pacifica

Town of Portola Valley

City of Redwood City

City of San Bruno

City of San Carlos

City of San Mateo

County of San Mateo

San Mateo County Flood and

Sea Level Rise Resiliency District

City of South San Francisco

Town of Woodside

Prepared for:

San Mateo Countywide Water Pollution Prevention Program (SMCWPPP)

555 County Center, Redwood City, CA 94063

A Program of the City/County Association of Governments (C/CAG)

Prepared by:

EOA, Inc.

1410 Jackson St., Oakland, CA 94610



TABLE OF CONTENTS

List of Tables	v
List of Figures	vi
List of Appendices	vii
List of Acronyms.....	ix
ES Executive Summary.....	ES-1
Introduction	ES-1
C/CAG Board of Directors.....	ES-1
Program Manager and Stormwater Program Specialist	ES-2
Stormwater Committee	ES-5
Technical Advisory Committee and Subcommittees.....	ES-5
Flood and Sea Level Rise Resiliency District	ES-6
Municipal Regional Permit Reissuance	ES-6
Organization of Report	ES-7
C.2 Municipal Operations.....	ES-8
C.3 New Development and Redevelopment	ES-8
C.4 Industrial and Commercial Site Controls.....	ES-10
C.5 Illicit Discharge Detection and Elimination	ES-11
C.6 Construction Site Control	ES-11
C.7 Public Information and Outreach.....	ES-12
C.8 Watershed Quality Monitoring	ES-13
C.9 Pesticides Toxicity Control	ES-13
C.10 Trash Load Reduction	ES-13
C.11 Mercury Controls.....	ES-14
C.12 PCBs Controls	ES-16
C.13 Copper Controls	ES-21
C.15 Exempted and Conditionally Exempted Discharges.....	ES-21
1 Introduction.....	1-1
Background	1-1
C/CAG Board of Directors.....	1-1
Program Manager and Stormwater Program Specialist	1-3
Stormwater Committee	1-6
Technical Advisory Committee and Subcommittees.....	1-8
Flood and Sea Level Rise Resiliency District	1-8
Municipal Regional Permit Reissuance	1-9
Organization of Report	1-9

2	Municipal Operations	2-1
	Introduction	2-1
	Implementation of MRP Provisions	2-1
	Public Works Municipal Maintenance Subcommittee	2-1
	Program Materials	2-2
	Future Actions	2-3
3	New Development and Redevelopment	3-1
	Introduction	3-1
	Implementation of MRP Provisions	3-2
	C.3 Implementation and Outreach Products	3-3
	New Development (C.3) Workshops	3-4
	Green Infrastructure Planning	3-4
	Green Infrastructure Outreach	3-4
	San Mateo Countywide Stormwater Resource Plan	3-5
	Reasonable Assurance Analysis (RAA) for Green Infrastructure	3-5
	Regional-Scale Stormwater Management and Countywide Collaboration	3-7
	Regional Project Planning and Collaborative Framework	3-9
	Parcel-Scale Stormwater Management	3-10
	Street-Scale Stormwater Management	3-11
	Tracking and Reporting Progress on Green Infrastructure	3-14
	Regional Collaboration	3-14
	Future Actions	3-15
4	Industrial and Commercial Site Controls	4-1
	Introduction	4-1
	Implementation of MRP Provisions	4-1
	CII Subcommittee	4-1
	Program Materials	4-2
	CII Training Workshop	4-2
	Future Actions	4-2
5	Illicit Discharge Detection and Elimination	5-1
	Introduction	5-1
	Implementation of MRP Provisions	5-1
	Countywide Program Materials	5-1
	Future Actions	5-2
6	Construction Site Control	6-1
	Introduction	6-1
	Implementation of MRP Provisions	6-1
	CALBIG Training Meeting	6-1
	2022 Construction Site Inspector Workshop	6-1
	Construction Site Inspection Form	6-2
	Future Actions	6-2

7	Public Information and Participation	7-1
	Introduction	7-1
	Summary of Accomplishments in FY 2021/22.....	7-1
	Implementation of MRP Provision C.7.....	7-2
	C.7.b Outreach Campaigns	7-2
	C.7.c Stormwater Pollution Prevention Education.....	7-7
	C.7.d Public Outreach and Citizen Involvement Events	7-14
	C.7.e Watershed Stewardship Collaborative Efforts	7-18
	C.7.f School-Age Children Outreach	7-18
	Future Actions.....	7-20
8	Water Quality Monitoring	8-1
9	Pesticide Toxicity Controls	9-1
	Introduction	9-1
	Implementation of MRP Provisions	9-1
	Parks Maintenance and IPM Work Group.....	9-2
	Annual Landscape Integrated Pest Management Workshop.....	9-2
	Coordination with San Mateo County Department of Agriculture	9-2
	Pesticide Tracking Template.....	9-2
	Participation in CASQA	9-2
	Point of Purchase Outreach	9-3
	Pest Control Contracting Outreach	9-6
	Future Actions.....	9-12
10	Trash Load Reduction	10-1
	Introduction	10-1
	Implementation of MRP Provisions	10-1
	Trash Subcommittee	10-2
	Demonstration of Trash Load Reductions (C.10.a.ii).....	10-3
	Trash Hot Spot Cleanup and Assessment Guidance.....	10-6
	BASMAA Final Receiving Water Trash Monitoring Report.....	10-6
	Coordination with San Mateo Countywide Recycling Committee	10-7
	Litter Work Group	10-7
	Countywide Expanded Analysis of Potential Large Trash Full Capture Locations Associated with Caltrans ROW	10-8
	Future Actions.....	10-9
11	Mercury Controls	11-1
	Introduction	11-1
	Implementation of MRP Provisions	11-1
	C.11/12.a. Implement Control Measures to Achieve Mercury/PCBs Load Reductions	11-1
	C.11/12.b. Assess Mercury/PCBs Load Reductions from Stormwater	11-1
	C.11/12.c. Plan and Implement Green Infrastructure to Reduce Mercury/PCBs Loads	11-2
	C.11/12.d. Prepare Implementation Plan and Schedule to Achieve TMDL Allocations.....	11-2
	C.11.e./C.12.h. Risk Reduction Program	11-2
	Future Actions.....	11-7

12	PCBs Controls	12-1
	Introduction	12-1
	Implementation of MRP Provisions	12-1
	C.11/12.a. Implement Control Measures to Achieve Mercury/PCBs Load Reductions	12-1
	C.11/12.b. Assess Mercury/PCBs Load Reductions from Stormwater	12-1
	C.11/12.c. Plan and Implement Green Infrastructure to Reduce Mercury/PCBs Loads	12-1
	C.11/12.d. Prepare Implementation Plan and Schedule to Achieve TMDL Wasteload Allocations	12-2
	C.12.e. Evaluate PCBs Presence in Caulks/Sealants Used in Storm Drain or Roadway Infrastructure in Public Rights-of-Way	12-2
	C.12.f. Manage PCB-Containing Materials and Wastes during Building Demolition Activities So That PCBs Do Not Enter Municipal Storm Drains	12-2
	C.12.g. Fate and Transport Study of PCBs: Urban Runoff Impact on San Francisco Bay Margins	12-5
	C.12.h. Risk Reduction Program	12-6
	Future Actions	12-6
13	Copper Controls.....	13-1
	Introduction	13-1
	Implementation of MRP Provisions	13-1
	C.13.a Copper Architectural Features	13-1
	C.13.b Manage Discharges from Pools, Spas and Fountains.....	13-1
	C.13.c. Industrial Sources	13-2
	Future Actions.....	13-2
15	Exempted and Conditionally Exempted Discharges.....	15-1
	Introduction	15-1
	Implementation of MRP Provisions	15-1
	Provision C.15.b.iv. Individual Residential Car Washing	15-1
	Provision C.15.b.v. Swimming Pool, Hot Tub, Spa, and Fountain Water Discharges	15-3
	Provision C.15.b.v.i. Irrigation Water, Landscape Irrigation, and Lawn or Garden Watering	15-5
	Future Actions.....	15-11

LIST OF TABLES

Table 3-1	Pilot Integrated Safe Routes to School and Green Streets Infrastructure Project Costs (2017-2022)	3-13
Table 7-1	SMCWPPP E-Newsletter Metrics for FY 2021/22	7-11
Table 7-2	FY 2021-22 Public Outreach and Citizen Involvement Events and Metrics	7-15
Table 7-3	Greening Schoolyards Program Reach.....	7-18
Table 9-1	FY 2021/22 San Mateo County IPM In-store Tabling Events	9-4
Table 9-2	FY 2021/22 San Mateo County Participating OWOW Hardware Stores.....	9-4
Table 9-3	FY 2021/22 IPM-Focused Webinar Data	9-4
Table 9-4	FY 2021/22 outreach results with licensed pest control operators.....	9-7
Table 10-1	Number of OVTAs completed in San Mateo County by fiscal year	10-5
Table 11-1	Summary of Fish Smart program accomplishments	11-3
Table 15-1	Summary of Facebook Posts on Pesticide Pollution Prevention Topics	15-5
Table 15-2	Summary of Instagram posts on pesticide pollution prevention topics.....	15-5
Table 15-3	Summary of Facebook posts promoting landscape management and the use of drought-tolerant, native vegetation	15-8
Table 15-4	Summary of Instagram posts promoting landscape management and the use of drought-tolerant, native vegetation	15-9

LIST OF FIGURES

Figure 1-1	Organizational Structure and Meeting Schedule	1-11
Figure 3-1	Strategies for Cost-Effective Stormwater Management.....	3-7
Figure 7-1	Image of San Mateo County residents lined up during a rain barrel distribution event	7-3
Figure 7-2	Before and after photo of the rain garden installed as part of the hands-on workshop ...	7-4
Figure 7-3	A GSS event in Half Moon Bay	7-7
Figure 7-4	Examples of FY 2021/22 Facebook Posts.....	7-9
Figure 7-5	Examples of FY 2021/22 Instagram Posts	7-10
Figure 7-6	Examples of FY 2021/22 Facebook Advertisements	7-11
Figure 7-7	Google Analytics metrics for FY 2021/22.....	7-14
Figure 7-8	Variety of images from outreach events throughout the fiscal year.....	7-17
Figure 7-9	Screenshots of the student presentation	7-19
Figure 9-1	Examples of Facebook posts promoting pesticide pollution prevention	9-8
Figure 9-2	Examples of Instagram posts promoting pesticide pollution prevention.....	9-10
Figure 9-3	Screenshots of “Pest Control Professionals” web page on the Flows To Bay website.....	9-11
Figure 15-1	Examples of Facebook Posts about Car Washing	15-2
Figure 15-2	Automotive maintenance webpage.....	15-3
Figure 15-3	Swimming pool, hot tub, spa, and fountain water discharge BMP fact sheet	15-4
Figure 15-4	Examples of Facebook posts about swimming pool, hot tub, spa, and fountain water discharge	15-4
Figure 15-5	Facebook posts on pesticide pollution prevention topics	15-6
Figure 15-6	Instagram posts on pesticide pollution prevention topics	15-7
Figure 15-7	Screenshot of blog on SMCWPPP’s website that featured water conservation tips.....	15-8
Figure 15-8	Facebook posts promoting landscape management and the use of drought-tolerant, native vegetation	15-9
Figure 15-9	Instagram post promoting landscape management and the use of drought-tolerant, native vegetation	15-9
Figure 15-10	Screenshot of blog on SMCWPPP’s website that featured native plants.....	15-10
Figure 15-11	Screenshot of newsletter sent on Feb. 26 promoting a webinar on reducing herbicide use	15-11

LIST OF APPENDICES

APPENDIX 1

- Stormwater Committee – Attendance List for FY 2021/22

APPENDIX 2

- Municipal Maintenance Subcommittee – Attendance List for FY 2021/22

APPENDIX 3

- New Development Subcommittee – Attendance List for FY 2021/22
- Biotreatment Soil Media – Tree Design Work Group Meeting Summary 1/26/2022
- Annual Development Workshop – Moving Ahead with GI and LID Implementation August 18, 2021
 - Workshop Agenda
 - Workshop Attendance
 - Workshop Evaluation Summary
- Annual Development (C.3) Workshop June 22, 2022
 - Workshop Agenda
 - Workshop Attendance
 - Workshop Evaluation Summary

APPENDIX 4

- CII Subcommittee – Attendance List for FY 2021/22
- CII Stormwater Inspector Workshop – June 28, 2022
 - Workshop Agenda
 - Attendance List
 - Evaluations Summary

APPENDIX 6

- CALBIG Meeting: Construction Site Stormwater Compliance – 2021
 - Attendance List
- Construction Site Stormwater Inspections Training – March 30, 2022
 - Workshop Agenda
 - Attendance List
 - Evaluations Summary

APPENDIX 7

- Public Information and Participation Subcommittee – Attendance List– FY 2021/22
- Rain Barrel Outreach Program Survey Report
- Rain Barrel Outreach Program

- Social Media posts and ads
- Content Toolkit
- Digital Newsletter
- Shared Content by Community Partners
- Example of Relevant Blogs
- Rain Garden Outreach Program
 - Flows To Bay webpage
 - Social Media Posts and ads
 - Digital Newsletter
- Blog Posts Examples and Metric Analytics
- Greening School Yards

APPENDIX 9

- Parks Maintenance & IPM Work Group Attendance List FY 2021/22
- Landscape Integrated Pest Management (IPM) Workshop – March 16, 2022
 - Workshop Agenda
 - Attendance List
 - Evaluations Summary
- Pest Control Point of Purchase Outreach
- Pest Control Contracting Outreach

APPENDIX 10

- Trash Subcommittee Attendance List – FY 2021/22
- Litter Work Group – Attendance List – FY 2022/22

APPENDIX 11

- Updated Control Measures Plan for PCBs and Mercury in San Mateo County Stormwater Runoff, SMCWPPP, September 30, 2022

APPENDIX 12 - PCBs Controls

- Program for Management of PCBs during Building Demolition – Data Summary through FY 2021/22 for San Mateo County MRP Permittees

APPENDIX 13 - BASMAA/CASQA

- FY 2021/22 Regional Supplement for New Development and Redevelopment, San Francisco Bay Area, Municipal Regional Stormwater Permit, Bay Area Municipal Stormwater Collaborative, September 2022
- CASQA 2022 Pesticide Annual Report and Effectiveness Assessment Final Report, California Stormwater Quality Association, August 2022
- CASQA FY 2021-22 Our Water Our World (OWOW) Report, California Stormwater Quality Association, September 2022.

LIST OF ACRONYMS

BASMAA	Bay Area Stormwater Management Agencies Association
BAWSCA	Bay Area Water Supply and Conservation Agency
BMPs	Best Management Practices
BSM	Biotreatment Soil Mix
C3TG	C.3 Stormwater Technical Guidance
CALBIG	California Building Inspectors Group
CASQA	California Stormwater Quality Association
C/CAG	City/County Association of Governments of San Mateo County
CEQA	California Environmental Quality Act
CII	Commercial/Industrial/Illicit Discharge
DC	Development Committee
DIY	Do-It-Yourself
DO	Dissolved Oxygen
DPR	Department of Pesticide Regulation
EHS	San Mateo County Environmental Health Services
EPA	Environmental Protection Agency
FY	Fiscal Year
GSRD	Gross Solids Removal Device
GI	Green Infrastructure
GIS	Geographic Information System
IPM	Integrated Pest Management
IMR	Information Monitoring Report
JPA	Joint Powers Authority
LID	Low Impact Development
MRP	Bay Area Stormwater NPDES Municipal Regional Permit
MS4	Municipal Separate Storm Sewer System
NDS	New Development Subcommittee
NPDES	National Pollutant Discharge Elimination System
OAL	California Office of Administrative Law
O&M	Operations and Maintenance

OWOW	Our Water Our World
PCBs	Polychlorinated Biphenyls
PIP	Public Information and Participation
POC	Pollutants of Concern
POTW	Publicly Owned Treatment Works (sewage treatment plants)
RFQ	Request for Qualifications
RMP	San Francisco Estuary Regional Monitoring Program
SAP	Sampling and Analysis Plan
SCVURPPP	Santa Clara Valley Urban Runoff Pollution Prevention Program
SFEP	San Francisco Estuary Partnership
SFEI	San Francisco Estuary Institute
SMC	San Mateo County
SMCWPPP	San Mateo Countywide Water Pollution Prevention Program
SOP	Standard Operating Procedure
STLS	Small Tributaries Load Strategy
SWRP	Stormwater Resource Plan
SWPPP	Stormwater Pollution Prevention Plan
TAC	Technical Advisory Committee
TMA	Trash Management Area
TMDL	Total Maximum Daily Load
WLA	Waste Load Allocation
WY	Water Year

EXECUTIVE SUMMARY

INTRODUCTION

This FY 2021/22 Annual Report was developed in compliance with the reissued National Pollutant Discharge Elimination System (NPDES) Municipal Regional Permit (referred to as the MRP)¹ for stormwater runoff discharges from San Mateo County and certain other San Francisco Bay Area communities. It summarizes stormwater management activities implemented by the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP or Countywide Program) in FY 2021/22. SMCWPPP's activities benefit 22 municipal agencies in San Mateo County: 15 cities, five towns, the County of San Mateo, and the San Mateo County Flood and Sea Level Rise Resiliency District (FSLRRD, also referred to as OneShoreline). Each of these agencies also separately submits an individual Annual Report to the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) focusing on that agency's stormwater management activities during FY 2021/22.

SMCWPPP is a program of the City/County Association of Governments (C/CAG) of San Mateo County. C/CAG is a Joint Powers Authority (JPA) that addresses issues of regional importance to San Mateo County jurisdictions such as congestion management and water quality. The C/CAG Board of Directors is comprised of a local elected city council representative from each city and town in San Mateo County, a member of the County Board of Supervisors, and representatives from the transit district and transportation authority. A 1993 amendment to the JPA Agreement made C/CAG responsible for assisting San Mateo County municipalities with complying with the municipal stormwater NPDES permit, including its latest incarnation as the MRP. Stormwater management-related activities of C/CAG and its various related committees and workgroups are described below.



C/CAG Board of Directors

Throughout FY 2021/22, the C/CAG Board of Directors received presentations, updates, and took actions on various stormwater-related issues, as summarized below (all C/CAG Board of Directors meeting agenda materials and minutes are available at www.ccag.ca.gov/board-of-directors):

- July 2021 – approved Measure M Strategic and Implementation Plan for 2021/22 - 2025/26, including 3% increase in countywide stormwater revenue allocation; appointed new C/CAG Executive Director (Sean Charpentier), starting August 1, 2021.
- October 2021 – Received 2021 CASQA Awards presentation on San Mateo Countywide Sustainable Streets Master Plan and SMCWPPP website; received presentation on MRP 3.0 Tentative Order and summary from Oct 12 and 13 Regional Water Board hearings.

¹NPDES Permit No. CAS612008 (Order No. R2-2015-0049), dated November 19, 2015. The MRP has a five-year term: effective January 1, 2016 and expires December 31, 2020. However, the permit term has been administratively extended during the currently ongoing permit reissuance process. July 1, 2022 is the anticipated effective date of the reissued permit.

- November – 2021 Received presentation from OneShoreline on program updates; appointed to the Stormwater Committee: Luis Sun, Public Works Director, City of Foster City; amended Task Order LWA-07 for an additional \$50,000 for on-call support to augment staff transition as needed in FY 2021/22; entered into agreement with Global Philanthropies Partnership designating C/CAG as the project lead on the Climate Resilience Resources Guide: Part I project; received recruitment letter from C/CAG Chair regarding vacant seats on OneShoreline Board of Directors; received testimony from C/CAG Chair on the Tentative Order of the MRP, dated October 13, 2021.
- December 2021 – Received a presentation from San Francisco Estuary Institute on “How Healthy is the Bay?”; appointed to the Stormwater Committee: Matthew Lee, Public Works Director, City of San Bruno; approved C/CAG appointments to the OneShoreline Board of Directors, including Debbie Ruddock (Coastal), Diane Papan (Central), and Marie Chuang (At-large City); received letter from SMCWPPP providing public comment on the Tentative Order of the MRP, dated November 16, 2021; received press releases regarding a rain barrel bulk-order distribution event held on November 13, 2021.
- January 2022 – Amended agreement with the Bay Area Water Supply and Conservation Agency (BAWSCA) for an additional \$25,000 for an additional bulk order rain barrel campaign in FY 2021/22.
- April 2022 – Amended Task Order URD-02 with Urban Rain Design, extending the Task Order to June 30, 2022 for no additional cost; received update on three topic areas (Micromobility, Stormwater, and Greenhouse Gas Reduction) presented at the 2021 C/CAG Board Annual Forum.
- March 2022 – Approved executing an agreement with Bay Tree Design (\$97,761) for the Resilient San Carlos Schoolyards Project to develop concept designs for integrating GI into school campuses for climate resilience and water quality improvement; received an update on MRP reissuance.
- April 2022 – Annual C/CAG Forum, including a breakout session discussing stormwater funding shortfall solutions.
- May 2022 – Received draft FY 2022/23 C/CAG Budget, including budget for the Countywide Program.
- June 2022 – Amended Agreement with BAWSCA for the Rain Barrel and Rain Garden Rebate Program, extending the term to June 30, 2023 and adding an amount not to exceed \$25,000 for FY 2022/23, for a new total contract amount not to exceed \$135,000; amended task orders with EOA, Inc., Larry Walker Associates, S. Groner Associates, and Urban Rain Design for various technical support services to the Countywide Program; waived the Request for Proposals process, consistent with C/CAG’s procurement policy, and executed a license agreement with Engineering Data Software, Inc. to provide annual property fee assessment support to the Countywide Program for an annual amount not to exceed \$25,000 and a total amount not to exceed \$125,000 for the license agreement term set to expire December 31, 2027; approved FY 2022/23 C/CAG Budget, including budget for the Countywide Program.

Program Manager and Stormwater Program Specialist

C/CAG’s Program Manager oversees the overall Countywide Program, serving as staff to the C/CAG Board and liaison among San Mateo County municipalities, technical consultants, committees, the Bay Area Stormwater Management Agencies Association (BASMAA) and its successor organization (Bay Area Municipal Stormwater Collaborative), the California Stormwater Quality Association (CASQA), and Regional Water Board staff. The Program Manager represents San Mateo County municipalities at regional

and statewide meetings and manages technical consultants that support programmatic activities. C/CAG's Stormwater Program Specialist (Specialist) supports the Program Manager in implementing the Countywide Program. In early September 2021, the prior Program Manager left C/CAG and the Stormwater Program Specialist has been acting in the capacity of the Program Manager overseeing the Countywide Program since then.

Participation in Relevant Regional and Statewide Organizations and Activities

In addition to providing regular staff support, agenda reports, and presentations to the C/CAG Board and the Stormwater Committee, the Program Manager and Specialist participated in the following activities during the FY 2021/22 reporting year:

- BASMAA/BAMSC: BASMAA formally dissolved as a non-profit organization at the end of FY 2020/21 and was succeeded by an informal collaborative called the Bay Area Municipal Stormwater Collaborative (BAMSC). The Program Manager and Program Specialist continued representing the Countywide Program on BAMSC and the Program Specialist started serving as Co-Chair of the BAMSC Steering Committee in January 2022. Program Manager and Specialist participated in Steering Committee meetings and subcommittee meetings and participated in regional collaboration efforts and information sharing. Over the course of the fiscal year the Specialist continued serving as Vice Chair of the Monitoring and Pollutants of Concern Committee and also represented stormwater programs on the San Francisco Bay Regional Monitoring Program (RMP) Emerging Contaminant Work Group (ECWG) and two-day annual meeting in April. The Program Specialist also transitioned to a member of the Technical Advisory Committee on the Contra Costa Alternative Compliance System project in place of the prior Program Manager.
- CASQA: The Program Manager and Specialist attended and presented at the annual CASQA conference and participated in CASQA's Funding Committee and Legislative Committee and presented on the Countywide Program's Regional Collaborative Program Framework for regional scale stormwater management at the February 1, 2022 Funding Committee.
- San Francisco Estuary Partnership Implementation Committee: The Program Manager continued serving on the committee representing the municipal stormwater perspective, participating in quarterly meetings.
- Green Infrastructure Leadership Exchange: The Program Manager and Specialist continued participating in the Green Infrastructure Leadership Exchange. The Program Specialist also submitted in collaboration with four member agency partners for a Collaborative Grant administered by the GI Leadership Exchange to develop a Climate Resilience Resources Guide to advance integration of climate adaptation in municipal GI programs at a national/North American Level. The project was initiated in January 2022 and the initial draft of the guide was completed by the end of June.
- The Program Manager / Specialist gave a number of presentations/testimony via Silicon Valley Bicycle Coalition, CASQA, BAWSC, and Regional Water Board hearings on a variety of topics related to stormwater management.
- The Program Manager and Specialist continued working with C/CAG's state legislative advocate to make recommendations for C/CAG's Board to consider position letters and bill amendments on legislation that supports C/CAG's member agencies and the Countywide Program with meaningful and cost-effective stormwater management.

- C/CAG procured consultant support for federal advocacy services, primarily to pursue federal grants and budget requests through coordination with C/CAG's Congressional district representatives, including a successful district member directed funding request through Congresswoman Jackie Speier's office for \$2.4M in support of the San Bruno Regional Stormwater Project at the Caltrans I-280/I-380 interchange.

Grant-funded Project Activities

The Program Manager and Specialist continued implementing and completed C/CAG's Regional Stormwater Collaborative project funded by a \$200,000 grant from the California Natural Resources Agency and, in collaboration with the County of San Mateo's Office of Sustainability, \$100,000 in grant funds from the USEPA Water Quality Improvement Fund. These funds were allocated to SMCWPPP consultants, in conjunction with additional pro-bono support from American Rivers / Corona Environmental and the WaterNow Alliance to support innovative funding and financing mechanisms for countywide GI investments in San Mateo County. The multi-pronged partnership project is intended to advance implementation of regional-scale, multi-benefit stormwater management in San Mateo County. Regional-scale stormwater management is defined to include large-scale regional retention facilities as well as programmatic implementation of smaller, distributed-scale stormwater facilities such as through the C/CAG's countywide rain barrel / cistern / rain garden rebate and incentive program. The four interrelated project components and associated consultants/partners are summarized below.

1. Building the Business Case for Regional-Scale Stormwater Management

- a. Drivers and Objectives Report - Appendix A of the White Paper: Establishes the "What" in terms of what can be achieved through regional-scale stormwater management through establishing key drivers and associated objectives.
- b. Business Case Memo - Appendix B of the White Paper: Establishes the "Why" in terms of why C/CAG's member agencies, from a cost-benefit perspective, would benefit from countywide collaboration on regional-scale stormwater management.
- c. Collaborative Program Framework White Paper: Establishes the "How" in terms of how C/CAG's member agencies, and potentially other stakeholders, can collaborate across jurisdictional lines on regional scale stormwater management.

2. Prioritizing and Conceptualizing Regional-Scale Stormwater Management Opportunities

- a. Regional Projects Opportunities and Prioritization Analysis - Appendix C of the White Paper: Building from analyses done for the Countywide Stormwater Resource Plan and Sustainable Streets Master Plan, the regional projects opportunities identification and prioritization analysis looks to find the best opportunities throughout the county for regional-scale stormwater management.
- b. Project Concepts: Five new project concepts were developed with funding from the EPA Water Quality Improvement Fund grant managed by the County, which detail planning level conceptual designs, performance goals and cost estimates for high-priority stormwater capture opportunities throughout the county.

3. **Credit Trading Marketplace Analysis - Appendix D of the White Paper**: This project evaluated the potential for creating a stormwater credit trading marketplace in San Mateo County that would allow private developers or C/CAG member agencies to buy and sell stormwater management credits to increase rates of implementation.

4. **Innovative Funding and Financing Analysis - Appendix E of the White Paper:** This project evaluated innovative funding and financing options for all scales of stormwater management, from large regional capture facilities to small-scale rainwater harvesting rebate and incentive programs, including key considerations when structuring potential funding initiatives to maximize flexibility for implementation on public and private properties.

Additionally, C/CAG staff worked with its selected consultant, Bay Tree Design, to advance the Resilient San Carlos Schoolyards project funded via a \$97,000 grant from the California Resilience Challenge in 2020. The project kicked off at the end of FY 2020/21 and progressed through developing guiding goals and principles for resilient schoolyards, site evaluation and selection, school community engagement including student design workshops and curriculum integration and development of initial base maps for resilient schoolyards concept development at three sites in the San Carlos School District showing how GI can be integrated to help reduce runoff, improve water quality, recharge groundwater, and reduce urban heat islands.

Stormwater Committee

C/CAG's stormwater management-related decisions are generally made in consultation with the NPDES Stormwater Committee. At its November 2012 meeting, the C/CAG Board authorized reconvening this committee to include director-level appointees with decision-making authority for implementing stormwater management programs within San Mateo County municipalities in compliance with requirements in the MRP. The Committee meets on an approximate bimonthly basis (depending on need) on the third Thursday of the month, formerly at the San Mateo County Transit District Office in San Carlos. Consistent with other C/CAG committees and the Board of Directors meetings, the Stormwater Committee has been meeting remotely pursuant to state and local public safety orders related to Covid-19 and the stipulations of AB 361. Public notices for Committee meetings are posted in accordance with Brown Act requirements in C/CAG's designated kiosk located at 555 County Center, Redwood City.

The Stormwater Committee met 11 times during FY 2021/22 (July, August, September, October, November (Special Meeting November 4 and Regular Meeting), January, February, March, April, and June (Special Meeting June 30) to assist with planning and organizing SMCWPPP's stormwater management activities including MRP compliance actions. Appendix 1 includes a table summarizing attendance at the Stormwater Committee meetings held during FY 2021/22. Details on Stormwater Committee meeting agendas, minutes, and presentations can be found on the Committee's [website](#).

The Stormwater Committee currently has three Ad-hoc Workgroups, including the longstanding MRP 3.0 Implementation Workgroup, the reinstated Funding and Financing Ad-hoc Workgroup (reinstated March 2021), and the newly created Workgroup Advancing Regional Projects, which was established at the February 2022 Stormwater Committee with the responsibilities to advance the development of a Regional Collaborative Program to support regional-scale stormwater management via multi-jurisdictional projects and programmatic implementation of distributed green infrastructure.

Technical Advisory Committee and Subcommittees

The Stormwater Committee provides direction to and receives feedback and recommendations from the Technical Advisory Committee (TAC). During FY 2012/13, the TAC transferred its former policy-related functions to the Stormwater Committee and transitioned to a quarterly workshop format. The new format allowed more detailed discussion of MRP compliance topics, including check-ins on what jurisdictions

should be focused on in the coming quarter and what should have been accomplished and documented in the preceding quarter. The TAC did not meet in FY 2021/22 but received regular emails from the Program Manager or Specialist with updates on key permit compliance topics and occasional requests for feedback.

SMCWPPP has established various subcommittees and work groups to the TAC to help implement the different aspects of MRP. The subcommittees and work groups met regularly during FY 2021/22 and are discussed below.

Flood and Sea Level Rise Resiliency District

[AB 825](#) (Mullin) became law on January 1, 2020, officially revamping the San Mateo County Flood Control District to become the San Mateo County Flood and Sea Level Rise Resiliency District (FSLRRD, also referred to as OneShoreline). The FSLRRD is intended to address sea level rise, coastal erosion, flooding, and regional stormwater management. As such, assuming the FSLRRD can secure long-term, sustainable funding during the startup period, it will likely play a key role in helping to design, build, and maintain regional stormwater facilities that will help achieve water quality goals in the MRP. The three-year funding commitment by the County and cities/towns (\$4.5 million over three years) is an important step forward for achieving integrated water management in San Mateo County.

The C/CAG Board appointed five city/town elected officials to the governing board. The County Board of Supervisors appointed two supervisors. At its December 2021 meeting, the C/CAG Board approved three appointments to the FSLRRD Board of Directors to fill the Coast, Central and At-large C/CAG-designated seats, which the authorizing legislation specified as the first round of staggered terms. The seven governing board members representing the different geographic areas in the county are:

- North: Donna Colson, City of Burlingame
- Central: Diane Papan, City of San Mateo
- South: Lisa Gauthier, City of East Palo Alto
- Coast: Debra Ruddock, City of Half Moon Bay
- At-Large: Marie Chuang, Town of Hillsborough
- Coast Supervisor: Don Horsley
- At-Large Supervisor: Dave Pine

Len Materman (former San Francisquito Creek Joint Powers Authority Executive Director) was brought on as Chief Executive Officer in May 2020. Information on the FSLRRD can be found at its website, www.oneshoreline.org. The FSLRRD inherits the MRP permittee responsibilities of the prior Flood Control District, with those duties currently contracted to the County Department of Public Works for implementation and reporting. The FSLRRD was included as a replacement permittee under the MRP with its reissuance in 2022.

Municipal Regional Permit Reissuance

The reissued MRP was adopted by the Regional Water Board on May 11, 2022. The reissued permit is referred to as MRP 3.0 (the previous permit was referred to as MRP 2.0). During FY 2021/22, SMCWPPP and San Mateo County Permittee staff continued to participate in the ongoing reissuance process and

took a lead role in providing testimony during public hearing workshops on the reissued permit on behalf of SMCWPPP and the Bay Area collective of MRP permittees represented by the Bay Area Municipal Stormwater Collaborative. The process facilitated Regional Water Board, Bay Area countywide stormwater program, and MRP Permittee staff, and representatives from other organizations, working together through an overarching Steering Committee and several workgroups specific to MRP provisions/topics. In FY 2021/22, C/CAG staff and permittee representatives continued engaging in periodic meetings of MRP 3.0 work groups related to new or modified provisions proposed under MRP 3.0 including New Development and Green Infrastructure, Water Quality Monitoring, Trash Reductions, Unsheltered/Homeless Populations, Discharges Associated with Fire-fighting Activities, and more. C/CAG's Program Manager and Specialist continued to play a lead role in negotiations with Regional Water Board staff leading up to the adoption of the permit, especially in the areas of New and Redevelopment / Green Infrastructure, Water Quality Monitoring, and Trash Load Reductions.

On November 16, 2021, C/CAG's Program Specialist submitted a formal comment letter to the Regional Water Board on behalf of the San Mateo County permittees documenting comprehensive comments on the Draft Administrative Order. As noted above, in the role of Co-Chair of the BAMSC, the Program Specialist provided testimony on behalf of all permittees and countywide programs operating under the MRP at the May 11, 2022 adoption hearing for MRP 3.0.

ORGANIZATION OF REPORT

This FY 2021/22 Annual Report is structured around the following major provisions of the MRP:

- C.2. Municipal Operations
- C.3. New Development and Redevelopment
- C.4. Industrial and Commercial Site Controls
- C.5. Illicit Discharge Detection and Elimination
- C.6. Construction Site Control
- C.7. Public Information and Outreach
- C.8. Water Quality Monitoring
- C.9. Pesticides Toxicity Control
- C.10. Trash Load Reduction
- C.11. Mercury Controls
- C.12. PCBs Controls
- C.13. Copper Controls
- C.15. Exempted and Conditionally Exempted Discharges

The following sections briefly summarize how SMCWPPP assisted in FY 2021/22 in implementing the MRP for each of the above provisions.

C.2 Municipal Operations

The objective of MRP Provision C.2 is “to ensure development and implementation of appropriate Best Management Practices (BMPs) by all Permittees to control and reduce discharges of non-stormwater and stormwater runoff pollutants to storm drains and watercourses during operation, inspection, repair and maintenance activities of municipal facilities and infrastructure.” Most MRP-required Provision C.2 Municipal Operations tasks are implemented individually by each Permittee in San Mateo County. The Countywide Program helps agency staff to understand MRP requirements and develops various tools that assist agency staff to effectively plan, implement, and report on compliance activities. SMCWPPP’s assistance and the implementation of Municipal Operations tasks are coordinated through the SMCWPPP Public Works Municipal Maintenance Subcommittee.

SMCWPPP performs a number of tasks to assist San Mateo County Permittees with implementation of Provision C.2, with input and assistance provided by the Public Works Municipal Maintenance Subcommittee. FY 2021/22 accomplishments included the following:

- Held two Public Works Municipal Maintenance Subcommittee meetings.
- Updated a pesticide tracking template, in coordination with SMCWPPP’s Parks Maintenance and IPM Work Group, to assist San Mateo County Permittees comply with pesticide tracking and reporting requirements in MRP Provision C.9.a.

C.3 New Development and Redevelopment

C/CAG / SMCWPPP’s efforts during FY 2021/22 assisted San Mateo County municipalities with implementation of MRP Provision C.3, New Development and Redevelopment, including supporting green infrastructure planning requirements, and helped advance the most cost-effective and maximum benefit stormwater capture projects in San Mateo County. The associated accomplishments included the following:

- SMCWPPP held four meetings of the New Development Subcommittee (NDS) to assist municipal agencies in San Mateo County to comply with MRP Provisions C.3 and C.6 (Construction Controls). Each meeting was well attended.
- Through SMCWPPP’s facilitation of the NDS meetings and related review of work outside of the meetings, SMCWPPP helped to advance key elements of San Mateo County Permittee GI Plans, including the adoption of new GI-related policies, review of proposed project opportunities and concepts, and implementation of C.3 requirements.
- SMCWPPP completed a significant update to the C.3-C.6 Development Review Checklist, including the addition of new data pages to the Excel and PDF-form versions of the document to improve SMCWPPP tracking of GI and LID.
- SMCWPPP participated in the BAMSC Development Subcommittee and coordinated fall and spring meetings of the BAMSC Development Subcommittee BSM Tree-Design Work Group.
- SMCWPPP conducted a variety of GI outreach activities, including promotion of a rain barrel and rain garden rebate program paired with two bulk order rain barrel distribution events, publishing newsletter articles, and posting on social media. C/CAG staff also attended classroom presentations and participated in efforts to engage schools via programs led by the San Mateo County Office of Education, including acting as a community partner in last year’s [Sustainable](#)

[Watersheds](#) teacher fellowship program and the new [Sustainable and Climate Ready Schools Initiative Partnership](#) in the water focus area.

- Other outreach on GI included maintaining the redesigned [flowstobay.org website](http://flowstobay.org), which includes several webpages focused on raising awareness about GI in San Mateo County, as well as continuing piloting a Green Streets Stewardship Program in partnership with the Master Gardeners of San Francisco and San Mateo Counties to help maintain public GI and provide engagement opportunities for Master Gardener volunteers. C/CAG's partnerships with schools has expanded in the last year with new pilot projects at [six school sites](#) (total of nine since 2020/21).
- SMCWPPP continued to promote the Green Infrastructure Design Guide (GI Design Guide) for use by San Mateo County Permittees and external partners. The GI Design Guide includes broad guidance on the design and implementation of various green stormwater infrastructure treatment measures and typical details and standard specifications for numerous GI design options and settings.
- C/CAG completed the Advancing Regional-Scale Stormwater Management in San Mateo County Project in January 2022. This multi-pronged project set out to achieve four main objectives: 1) develop a business case for regional stormwater management in the county, addressing the "what", "why" and "how" of delivering cost-effective multi-benefit green stormwater infrastructure at a regional scale (including regional capture and programmatic distributed green stormwater infrastructure); 2) identify and prioritize the next round of opportunities for regional multi-benefit stormwater capture projects and develop five project concepts for the highest performing regional project sites across multiple drivers from the countywide analysis; 3) conduct a credit trading market feasibility analysis for supply and demand conditions under MRP 3.0 Regulated Projects conditions in San Mateo County; and 4) evaluate innovative funding and financing options for advancing countywide green stormwater investments. The four components of the project culminated in a [Regional Collaborative Program Framework White Paper and Appendices](#), laying the foundation for establishing the initial phase (and future phases) of a cost-sharing/market-based program for regional stormwater management. This project was funded with \$200,000 from a State General Fund Grant administered by the California Natural Resources Agency awarded to C/CAG in 2019 and \$100,000 from a US Environmental Protection Agency Water Quality Improvement Fund awarded to the County Office of Sustainability, also in 2019.
- C/CAG continued its collaboration with the Cities of Redwood City, Belmont, San Bruno, the County of San Mateo, and the California Natural Resources Agency, leveraging the same grant sources mentioned above, to advance design and environmental documentation for three multi-benefit regional-scale stormwater capture projects. Notably, the first regional project in the County was completed in June 2022 at Orange Memorial Park in the City of South San Francisco and will have a one-year commissioning period to evaluate initial operations and maintenance activities and costs.
- Notably, C/CAG staff were successful in a member-directed spending request through Congresswoman Jackie Speier's office for \$2.5M in additional funding towards the San Bruno I-280/I-380 regional stormwater capture project, which has passed the House and is awaiting approval from the Senate.

- C/CAG expanded its partnership with BAWSCA to provide two bulk order rebate campaigns in partnership with a bulk distributor (RainWater Solutions) and partner agencies/organizations to host in-person distribution events in November and January and continued its new tiered rain barrel program and new incentives for incorporating rain gardens in lawn replacement projects.
- Coordinating with schools and the County Office of Education, C/CAG made significant progress with its Resilient San Carlos Schoolyards project under a \$97,000 grant from the Bay Area Council's California Resilience Challenge Grant to develop schoolyard greening concepts for three sites in the San Carlos School District, completing the engagement process and initial concept base maps in June. C/CAG also funded several rain barrel installations at schools throughout the county and supported a full rain garden design and installation at Belle Haven Elementary School in Menlo Park.
- C/CAG successfully applied for funding under the Green Infrastructure Leadership Exchange Partnerships Grant Program and led the project team for the development of a Climate Resilience Resources Guide to support climate adaptation in GI programming throughout the nation.
- C/CAG staff supported local and regional implementation of GI through four presentations at the 2021 California Stormwater Quality Association (CASQA) Annual Conference in October 2021, including two awards for the Sustainable Streets Master Plan and the www.flowstobay.org website as well as two panel presentations on the Advancing Regional Scale Stormwater Management in San Mateo County project and on Co-funding Stormwater Incentives Through "Stacked Incentives" focusing on rainwater harvesting and rain gardens; a presentation on the San Mateo County Sustainable Streets Master Plan at the Annual Silicon Valley Bike Summit in August 2021; two additional presentations on C/CAG's regional scale stormwater management approach at the February 1, 2022 CASQA Funding Subcommittee and the June 28, 2022 Bay Area Water Supply Conservation Agency's Regional Water Supply Reliability Roundtable; two presentations focusing on C/CAG's multi-scale green infrastructure strategy at the February 16, 2022 California Municipal Finance Officers meeting and the July 14, 2022 CASQA Quarterly Meeting; and a presentation on the GI Exchange Grant Funded Climate Resilience Resource Guide at the Exchange's April 2021 Planning and Resilience Learning Circle. C/CAG staff has also stayed engaged in other regional and statewide efforts, including staying involved in the Green Infrastructure Leadership Exchange, co-chairing the Bay Area Municipal Stormwater Collaborative (BAMSC) Steering Committee, and working with state legislators to support regional scale stormwater projects.

C.4 Industrial and Commercial Site Controls

A primary goal of SMCWPPP's Commercial, Industrial and Illicit Discharge (CII) component is to assist San Mateo County Permittees in controlling the discharge of pollutants in stormwater from commercial and industrial businesses to the maximum extent practicable. San Mateo County Permittees are responsible for complying with various business inspection requirements under MRP Provision C.4. SMCWPPP's CII component assists San Mateo County Permittee staff with understanding these MRP requirements and develops various related tools, templates, reporting forms, and other MRP compliance support materials. SMCWPPP's assistance with MRP Provision C.4 is coordinated through the CII Subcommittee, which met four times in FY 2021/22, with good participation by municipal staff.

During FY 2021/22, SMCWPPP performed a variety of tasks to assist San Mateo County Permittees with implementation of MRP Provision C.4, with input and assistance provided by the CII Subcommittee. Accomplishments included the following:

- Held a Commercial/Industrial Stormwater Inspector workshop on-line.
- Drafted a Parklet BMP Fact Sheet.
- Updated the business stormwater inspector contact list on the SMCWPPP website.

C.5 Illicit Discharge Detection and Elimination

Another important goal of SMCWPPP's CII component is to assist San Mateo County Permittees effectively prohibit the discharge of illicit, non-stormwater discharges to the municipal storm drain system. San Mateo County Permittees are responsible for controlling non-stormwater discharges prohibited by MRP Provision C.5. SMCWPPP's CII component assists San Mateo County Permittee staff with understanding these MRP requirements and develops various related tools, templates, reporting forms, and other MRP compliance support materials. SMCWPPP's assistance with MRP Provision C.5 is coordinated through the CII Subcommittee.

During FY 2021/22, SMCWPPP performed a number of tasks to assist San Mateo County Permittees with implementation of MRP Provision C.5, with input and assistance provided by the CII Subcommittee. Accomplishments included the following:

- Updated the table of stormwater enforcement actions against mobile businesses to share countywide with stormwater inspectors.
- Held a Commercial/Industrial/Illicit Discharge Stormwater Inspector workshop on-line.
- Updated the Illicit Discharge contact list on the SMCWPPP website.

C.6 Construction Site Control

This component of SMCWPPP assists San Mateo County municipalities in complying with MRP Provision C.6 (Construction Site Control). This assistance continued to be provided through the New Development Subcommittee. SMCWPPP's accomplishments during FY 2021/22 include the following tasks to assist San Mateo County municipalities with implementation of MRP Provision C.6:

- Conducted a construction site controls and inspection training for the California Building Inspectors Group (CALBIG) on October 13, 2021.
- Conducted a construction site inspector training for municipal staff, and consultants representing municipalities, on March 30, 2022.
- Discussed at the February 2022 NDS meeting proposed changes to requirements in Provision C.6 Construction Site Control based on the Tentative Order of MRP 3.0.
- Printed and distributed 2,000 copies of the Construction Site Inspection Form to the Subcommittee members.

C.7 Public Information and Outreach

The SMCWPPP PIP Subcommittee oversees the development of outreach and educational materials and guides the implementation of the PIP component of the program. The Subcommittee met two times in FY 2021/22 with good participation by municipal staff. SMCWPPP's PIP accomplishments during FY 2021/22 included the following:

- Partnered with the Bay Area Water Conservation Supply Agency (BAWSCA) to promote the countywide rain barrel program in association with a bulk rain barrel distribution pilot program. The supporting Rain Barrel outreach campaign received 324 rebate applications from residents (a 391% increase from FY 2020/21) for a total of 541 rain barrel installations (415% increase from FY 20/21). Over 2,600 rain barrels have been installed to-date in San Mateo County under the rebate program.
- Partnered with BAWSCA to promote rain garden rebate as part of the Lawn Be Gone! Rebate. Launched a campaign to promote the rebate, which included a webinar. Results of the campaigns include one rain garden rebate, 1 rain garden webinar with 58 attendees, 1 rain garden in-person event with 5 attendees, and 27,042 total reach on social media posts.
- Partnered with and promoted the San Mateo County Office of Education's "San Mateo Environmental Solutionary Teacher Fellowship." This resulted in 2 teachers who completed the fellowship and reaching a total of 68 students, grades K to 12.
- Promoted Coastal Cleanup Day for 2,700 volunteers, raising awareness of the event and the consequences of littering behaviors resulting in 22,000 pounds of litter reported being picked up.
- Promoted efforts that San Mateo County Environmental Health Services (EHS) is involved in, which included: campaign to reduce littering of cigarette butts, update to the Reusable Bag Ordinance, and HHW Collection Program.
- Promoted Caltrans educational materials regarding uncovered loads in English and Spanish.
- Gained 292 new Facebook fans and a total post reach of 213,800 and 1,860 interactions with stormwater pollution prevention Facebook messaging.
- Sent 20 e-newsletters to a list of 4,065 active, opt-in subscribers with topics covering eco-friendly gardening practices, local cleanup events and stormwater pollution prevention information and tips. Gained 483 new email subscribers and had an average open rate of 49.6%.
- Received 90,606 visitors to the SMCWPPP website, which focuses on stormwater pollution prevention messaging and resources.
- Participated in 20 public outreach and citizen involvement events. In total, we had 860 attendees. These events, a mixture of virtual and in-person, provided educational content to residents and allowed residents to have their questions answered.
- Participated in a countywide stormwater-focused teacher fellowship program in coordination with the County Office of Education. In addition, we supported and facilitated the on-campus installation of 5 rain barrels and conducted 6 classroom lectures to teach students about watersheds and rainwater capture.
- Performed point-of-purchase outreach with Our Water Our World materials to 10 hardware stores in San Mateo County while engaging residents and employees with eco-friendly alternatives to pesticides.

- Promoted outreach messaging to residents and pest control operators regarding eco-friendly alternatives to pesticides in SMCWPPP's newsletter, website, and social media channels.

C.8 Water Quality Monitoring

On behalf of its member agencies, SMCWPPP performs water quality monitoring activities in compliance with MRP Provision C.8. Per Provision C.8, a complete documentation of all water quality monitoring data collected from October 1, 2021 through September 30, 2022 (i.e., Water Year 2022 or WY 2022) will be presented in SMCWPPP's Urban Creeks Monitoring Report, which will be submitted to the Regional Water Board by March 31, 2023.

C.9 Pesticides Toxicity Control

During FY 2021/22, SMCWPPP performed a number of tasks to assist member agencies with implementation of Provision C.9, with input and assistance provided by the Parks Maintenance and IPM Work Group. Accomplishments included the following:

- Held one meeting of the Parks Maintenance and IPM Work Group.
- Conducted SMCWPPP's Annual Landscape IPM Training Workshop in March 2022.
- Continued coordinating with San Mateo County Agriculture / Weights and Measures.
- Updated the pesticides tracking template with the current two years of pesticide product data from the Department of Pesticide Regulation (DPR) website.
- Participated in relevant BAMSC and CASQA activities.
- Continued to maintain retail partnerships with 10 top-tier stores (e.g., Home Depot and Hasset Ace Hardware) that sell pesticides/fertilizers within San Mateo County. Tasks included ordering materials, organizing outreach collateral, checking in with store managers, and providing outreach to residents.
- Conducted two online webinars with an IPM Advocate in association with Our Water Our World to educate residents about less toxic alternatives to commercial pesticides and fertilizers. We had 298 registrants, 153 attendees, and 92 feedback surveys taken.
- The IPM Advocate also conducted in-person outreach at popular hardware stores with three events in the fall and three events in the spring.
- Updated license status information in a database of San Mateo County pest control operators.
- Sent an email or mailed a letter to active-licensed pest control operators in San Mateo County.

C.10 Trash Load Reduction

Provision C.10 of the MRP addresses stormwater discharges of trash. San Mateo County Permittees are required to demonstrate that trash loads have been reduced from their stormwater conveyance systems. SMCWPPP helps Permittee agency staff to understand trash load reduction requirements and develops various tools needed to effectively plan, implement, and report on compliance with C.10 requirements, with input and assistance provided by the SMCWPPP Trash Subcommittee and the SMCWPPP Litter Work Group. FY 2021/22 accomplishments included the following:

- Coordinated and facilitated three meetings of SMCWPPP's Trash Subcommittee and one meeting

of SMCWPPP's Litter Work Group.

- Assisted San Mateo County Permittees in delineating trash full capture treatment areas and managing trash full capture information in GIS (currently > 10,000 acres are treated by full capture systems in San Mateo County).
- Continued to implement SMCWPPP's Trash Assessment Strategy, including conducting 677 On-land Visual Trash Assessments (OVTAs) at 233 sites and maintaining the Countywide Program's online OVTA database to allow San Mateo County Permittees access to timely load reduction estimates.
- Continued providing guidance to San Mateo County Permittees on MRP operation and maintenance requirements and standard operating procedures for trash full capture systems.
- Compiled and standardized data from 53 trash hot spot assessments and cleanups and entered the data into the SMCWPPP hot spot database.
- Completed data analysis and interpretation tasks as part of the SMCWPPP Litter Characterization Study.
- Planned the Litter Work Group's 5th Roundtable Event to provide the results of the Litter Characterization Study and share information on best practices of litter and single-use plastic food service ware.
- Coordinated with Caltrans, the Alameda County Illegal Dumping Task Force and the CalRecycle Illegal Dumping Technical Advisory Committee on programs and best practices for reducing illegal dumping in communities.
- Coordinated with the SMCWPPP Public Information and Participation (PIP) Subcommittee on public outreach efforts targeting litter reduction.
- Conducted an expanded countywide analysis to identify additional/revised large full trash capture systems that address Caltrans and SMCWPPP member agency trash generating areas (including re-evaluation of catchments with small full trash capture systems already installed).
- Coordinated with Daly City / Colma, Caltrans, and the Regional Water Board on the potential installation of a large trash full-capture system through a cooperative implementation agreement.
- Assisted San Mateo County Permittees in developing information necessary for reporting trash load reductions with their FY 2021/22 Annual Reports.

C.11 Mercury Controls

MRP Provision C.11 Mercury Controls implements stormwater runoff-related actions required by the San Francisco Bay mercury Total Maximum Daily Load (TMDL) water quality restoration program. SMCWPPP performs a variety of activities to address mercury in stormwater runoff in compliance with MRP Provision C.11. Please note that efforts that address both PCBs and mercury are described in this section rather than the following section (Section 12, PCBs Controls). Section 12 focuses on efforts that address PCBs only.

Efforts by SMCWPPP and San Mateo County municipalities to address MRP Provisions C.11/12.a., Implement Control Measures to Achieve Mercury/PCBs Load Reductions, are described in a separate report (*Updated Control Measures Plan for PCBs and Mercury in San Mateo County Stormwater Runoff, SMCWPPP, September 30, 2022*) that is presented in Appendix 11.

MRP Provisions C.11/12.b., Assess Mercury/PCBs Load Reductions from Stormwater, required Permittees to submit in their 2015/16 Annual Report for Executive Officer approval an assessment methodology. The purpose of the assessment methodology is to quantify in a technically sound manner mercury and PCBs loads reduced through implementation of a variety of pollutant controls, including pollution prevention, source control, and stormwater runoff treatment measures such as green infrastructure. SMCWPPP and San Mateo County municipalities helped develop the assessment methodology through participation in a BASMAA regional project. The methodology developed via the BASMAA regional project is referred to as the Interim Accounting Methodology and has been approved by the Executive Officer of the Regional Water Board.

Permittees must report on the use of the methodology to demonstrate progress toward achieving mercury and PCBs load reductions. San Mateo County load reductions are described in the separate report mentioned above (*Updated Control Measures Plan for PCBs and Mercury in San Mateo County Stormwater Runoff, SMCWPPP, September 30, 2022*). Appendix 11 contains the report.

Permittees were required to submit in their FY 2019/20 Annual Report an estimate of the amount and characteristics of land area that will be treated through green infrastructure implementation by 2020, 2030, and 2040, including all data used and a full description of models and model inputs relied on to generate this estimate.

Permittees were also required to submit in their FY 2019/20 Annual Report a Reasonable Assurance Analysis (RAA) to demonstrate quantitatively that mercury reductions of at least 10 kg/yr will be realized by 2040 through implementation of green infrastructure projects. The MRP requires this submittal to include all data used and a full description of models and model inputs relied on to make the demonstration and documentation of peer review of the RAA.

San Mateo County Permittees fulfilled the above MRP requirements via development of a separate report that was submitted with SMCWPPP's FY 2019/20 Annual Report (*Pollutant Control Measures Implementation Plan and Reasonable Assurance Analysis for San Mateo County, California, Scenarios to Achieve PCBs and Mercury San Francisco Bay TMDL Wasteload Allocations, September 30, 2020*).

MRP Provisions C.11/12.d. require that Permittees prepare a plan and schedule for mercury and PCBs control measure implementation and a corresponding RAA demonstrating quantitatively that sufficient control measures will be implemented to attain the mercury and PCBs TMDL wasteload allocations by 2028 and 2030, respectively. The plan must:

1. Identify all technically and economically feasible mercury and PCBs control measures to be implemented (including green infrastructure projects).
2. Include a schedule according to which these technically and economically feasible control measures will be fully implemented.
3. Provide an evaluation and quantification of the mercury and PCBs load reduction of such measures as well as an evaluation of costs, control measure efficiency and significant environmental impacts resulting from their implementation.

San Mateo County Permittees fulfilled this requirement via development of a separate report that was submitted with SMCWPPP's FY 2019/20 Annual Report (*Pollutant Control Measures Implementation Plan*

and Reasonable Assurance Analysis for San Mateo County, California, Scenarios to Achieve PCBs and Mercury San Francisco Bay TMDL Wasteload Allocations, September 30, 2020).

MRP Provisions C.11.e. and C.12.h. require Permittees to conduct an ongoing risk reduction program to address public health impacts of mercury and PCBs in San Francisco Bay fish. The fish risk reduction program is required to include actions to reduce actual and potential health risks in those people and communities most likely to consume San Francisco Bay-caught fish, such as subsistence fishers and their families. The program is required to have the potential to reach 3,000 individuals annually (Bay Area-wide total for all MRP 2.0 Permittees) who are likely consumers of San Francisco Bay-caught fish. Permittees are required to report on the status of the risk reduction program in each of their Annual Reports, including a brief description of actions taken, an estimate of the number of people reached, and why these people are deemed likely to consume Bay fish.

SMCWPPP is assisting San Mateo County municipalities comply with the risk reduction program requirements by coordinating with and reporting on the Fish Smart program conducted by San Mateo County Environmental Health Services (EHS). Fish Smart builds upon the San Francisco Bay Fish Project (sfei.org/sfbfp#sthash.eOcfwrhA.dpbs), a risk reduction framework developed regionally in the previous permit term. The Fish Project funded Bay Area community-based organizations to develop and deliver appropriate communications to appropriately targeted individuals and communities about how to reduce their exposure to mercury and PCBs from consuming San Francisco Bay fish.

During FY 2021/22, EHS continued to conduct a variety of activities that target at-risk populations (e.g., subsistence fisherman) via the Fish Smart program. Various quantitative measures of outreach and outcomes were documented (e.g., numbers of brochures distributed, numbers of people interacted with at outreach events, numbers of people receiving electronic newsletters, and social media postings impressions and reach). Fish Smart has succeeded over the past several years in providing outreach about potential health impacts of consuming certain types of fish caught in San Francisco Bay. It is likely these efforts have led to reduced health risks in those people and communities most likely to consume San Francisco Bay-caught fish, such as subsistence fishers and their families.

C.12 PCBs Controls

MRP Provision C.12, PCBs Controls, implements stormwater runoff-related actions required by the San Francisco Bay PCBs TMDL water quality restoration program. SMCWPPP performs a variety of activities to address PCBs in stormwater runoff in compliance with MRP Provision C.12. Please note that efforts that address both PCBs and mercury are described in the previous section (Section 11, Mercury Controls). This section focuses on efforts that address PCBs only.

Efforts by SMCWPPP and San Mateo County municipalities to address MRP Provisions C.11/12.a., Implement Control Measures to Achieve Mercury/PCBs Load Reductions, are described in a separate report (*Updated Control Measures Plan for Mercury and PCBs in San Mateo County Stormwater Runoff, SMCWPPP, September 30, 2022*) that is presented in Appendix 11.

For a description of efforts by SMCWPPP and San Mateo County municipalities to address MRP Provisions C.11/12.b., Assess PCBs Load Reductions from Stormwater, please see Section 11 (C.11 Mercury Controls) and the separate report mentioned previously (*Updated Control Measures Plan for PCBs and Mercury in San Mateo County Stormwater Runoff, SMCWPPP, September 30, 2022*). Appendix 11 contains the report.

It is important to note that per the documentation in SMCWPPP's FY 2019/20 Annual Report, the estimated PCBs load reduction across the permit area over the time period of FY 2013/14 through FY 2019/20 was 3,017 g/yr, indicating that the MRP regional performance criterion of 3,000 g/yr of PCBs load reduced by July 2020 was achieved.²

Permittees were required to submit in their FY 2019/20 Annual Report an estimate of the amount and characteristics of land area that will be treated through green infrastructure implementation by 2020, 2030, and 2040, including all data used and a full description of models and model inputs relied on to generate this estimate.

Permittees were also required to submit in their FY 2019/20 Annual Report a Reasonable Assurance Analysis (RAA) to demonstrate quantitatively that PCBs reductions of at least 3 kg/yr will be realized by 2040 through implementation of green infrastructure projects. The MRP requires this submittal to include all data used and a full description of models and model inputs relied on to make the demonstration and documentation of peer review of the RAA.

San Mateo County Permittees fulfilled the above MRP requirements via development of a separate report that was submitted with SMCWPPP's FY 2019/20 Annual Report (*Pollutant Control Measures Implementation Plan and Reasonable Assurance Analysis for San Mateo County, California, Scenarios to Achieve PCBs and Mercury San Francisco Bay TMDL Wasteload Allocations, September 30, 2020*).

As described in more detail in Section 11 (C.11 Mercury Controls), MRP Provisions C.11/12.d. require that Permittees prepare a plan and schedule for mercury and PCBs control measure implementation and a corresponding RAA demonstrating quantitatively that sufficient control measures will be implemented to attain the mercury and PCBs TMDL wasteload allocations by 2028 and 2030, respectively. San Mateo County Permittees fulfilled this requirement via development of a separate report that was submitted with SMCWPPP's FY 2019/20 Annual Report (*Pollutant Control Measures Implementation Plan and Reasonable Assurance Analysis for San Mateo County, California, Scenarios to Achieve PCBs and Mercury San Francisco Bay TMDL Wasteload Allocations, September 30, 2020*).

MRP 2.0 Provision C.12.e. requires that Permittees collect samples of caulk and other sealants used in storm drains and between concrete curbs and street pavement and investigate whether PCBs are present in such material and in what concentrations. BASMAA has completed a regional investigation that addresses this requirement. SMCWPPP reported on the results of the investigation in its FY 2017/18 Annual Report.

MRP Provision C.12.f. requires that Permittees develop and implement or cause to be developed and implemented an effective protocol for managing materials with PCBs concentrations of 50 parts per million or greater in applicable structures³ at the time such structures undergo demolition, so that PCBs do not enter municipal storm drain systems. A Permittee is exempt from this requirement if it provided

²It is important to note that the MRP allows Permittees to meet the regional criterion as a group – criteria for individual counties would only apply when the regional group criterion was not met.

³Applicable structures are buildings built or remodeled from January 1, 1950 through December 31, 1980, with the following exemptions: single-family residential buildings, wood-framed buildings, and partial building demolitions.

evidence acceptable to the Executive Officer in its FY 2016/17 Annual Report that the only buildings that existed pre-1980 within its jurisdiction were single-family residential and/or wood-frame buildings.⁴

Permittees were required to develop a protocol by June 30, 2019 that includes each of the following components, at a minimum:

- The necessary authority to ensure that PCBs do not enter municipal storm drains from PCBs-containing materials in applicable structures at the time such structures undergo demolition;
- A method for identifying applicable structures prior to their demolition; and,
- Method(s) for ensuring PCBs are not discharged to the municipal storm drain from demolition of applicable structures.

By July 1, 2019 and thereafter, Permittees are required to:

- Implement or cause to be implemented the PCBs management protocol for ensuring PCBs are not discharged to municipal storm drains from demolition of applicable structures via vehicle track-out, airborne releases, soil erosion, or stormwater runoff; and,
- Develop an assessment methodology and data collection program to quantify in a technically sound manner PCBs loads reduced through implementation of the protocol for controlling PCBs during demolition of applicable structures.

On behalf of MRP Permittees, BASMAA conducted a multi-year regional project to assist MRP Permittees to address Provision C.12.f. The BASMAA project, which began in FY 2016/17 and was completed in March 2019, assisted Permittees in developing local programs to manage PCBs-containing materials during building demolition. It developed guidance materials, tools and training materials and conducted outreach. SMCWPPP actively participated in the project, including providing BASMAA's project manager.

At the outset of the project, a BASMAA Steering Committee was convened to provide project oversight and guidance during the project. The Steering Committee included BASMAA Directors, countywide stormwater program staff, and Permittee staff from various relevant municipal departments. The Steering Committee met periodically throughout the project. In addition, a project TAG, a small balanced advisory group formed from industry, regulatory, and Permittee representatives to provide review and input on selected project work products, was convened. The TAG was comprised of representatives from industry and state/federal regulatory agencies, and Permittees. Other efforts to engage key stakeholders included an industry stakeholder roundtable meeting (August 2017) and two larger stakeholder group meetings (December 2017 and May 2018) that included industry, regulatory and municipal representatives. During FY 2018/19, Permittees tailored the BASMAA products for local use, adopted the program (e.g., via local policy or ordinance), and trained local staff to implement the new program starting July 1, 2019.

Key BASMAA project deliverables provided to each Permittee to use as appropriate given local procedures and needs included:

- A protocol for pre-demolition building survey for priority PCBs-containing building materials;
- Model language for municipal adoption (e.g., ordinance) of the new program to manage PCBs materials during building demolition and model supporting staff report and resolution;

⁴The City of Clayton in Contra Costa County provided acceptable evidence and is exempt from this provision.

- CEQA strategy and model notice of exemption;
- Supplemental demolition permit model application materials, including forms, process flow charts, and applicant instructions; and
- An analysis to assist municipalities that pursue cost recovery.

Other project deliverables included:

- A coordination/communication strategy for the project;
- A technical memorandum summarizing any new information & decisions needed by BASMAA at outset, including an annotated table of regulatory drivers and relevant requirements;
- A technical memorandum with the state of the practice for identifying PCBs-containing building materials (developed to inform development of the pre-demolition building survey protocol listed below);
- Industry stakeholder outreach materials and a fact sheet for municipal staff;
- A spreadsheet tool used to develop the prioritized list of potential PCBs-containing building materials that the demolition program will focus on;
- A conceptual approach for an assessment methodology and data collection program to quantify PCBs loads reduced through managing PCBs-containing materials during building demolition.

During FY 2018/19, the BASMAA project concluded by conducting the following outreach and training tasks:

- Prepared training materials for municipal staff on adoption and implementation of the new program;
- Developed outreach materials and a standard presentation to inform industry stakeholders including developers, planning firms, urban planning non-governmental organizations, demolition firms, property owners, property managers, and realtors about the new program to manage PCBs in building materials during demolition;
- Using the above training materials, conducted training workshops (in-person and a webinar) for key municipal and countywide stormwater program staff;
- Conducted a webinar for industry stakeholders; and
- Developed a list of Bay Area opportunities, including contact information and dates, for municipal and/or stormwater program staff to conduct additional outreach to industry stakeholders using the above industry outreach materials.

In addition, during FY 2018/19 and FY 2019/20, San Mateo County and other MRP Permittees worked together through the BASMAA Monitoring and Pollutants of Concern Committee (MPC) to develop a framework to comply with data collection/evaluation and reporting requirements under Provision C.12.f. As mentioned previously, these requirements include developing an assessment methodology and data collection program to quantify PCBs loads reduced through implementation of the new program. The regional process developed includes the following steps:

1. The municipality informs demolition permit applicants that their projects are subject to the MRP Provision C.12.f requirements, necessitating, at a minimum, an initial screening for priority PCBs–containing materials.
2. For every demolition project, applicants complete and submit a version of BASMAA’s model “PCBs Screening Assessment Form” (Screening Form) or equivalent to the municipality.
3. The municipality reviews the Screening Form to make sure it is filled out correctly and is complete and works with the applicant to correct any deficiencies.
4. The municipality then issues the demolition permit or equivalent, according to its procedures.
5. For Applicable Structures only, the municipality submits completed Screening Forms and any supporting documents (consultant’s report from PCBs building survey, QA/QC checklist, and lab reports) to its countywide program; forms for exempt sites need not be submitted. Forms should be submitted to the countywide programs electronically if feasible, and at a minimum annually, but quarterly is preferred.
6. The countywide programs compile the completed Screening Forms and any supporting documents. The countywide program then works with the other MRP countywide programs through BASMAA to manage and evaluate the data, and to assist Permittees with associated MRP reporting requirements.

All San Mateo County Permittees began implementing the program on or before July 1, 2019. Appendix 12 includes a memorandum prepared by SMCWPPP in compliance with MRP reporting requirements in Provision C.12.f. iii(4). The memorandum provides documentation of (a) the number of applicable structures that applied for a demolition permit during the reporting year, and (b) a running list of the applicable structures that applied for a demolition permit (since the date the PCBs control protocol was implemented) that had material(s) with PCBs at 50 ppm or greater, with the address, demolition date, and brief description of PCBs control method(s) used (*Program for Management of PCBs during Building Demolition – Data Summary through FY 2021/22 for San Mateo County MRP Permittees*).

MRP Provision C.12.g. requires Permittees to conduct or cause to be conducted studies concerning the fate, transport, and biological uptake of PCBs discharged from urban runoff to San Francisco Bay margin areas. This requirement is being addressed through a multi-year project by the RMP to develop a series of conceptual models of PCBs in Priority Margin Units (PMUs). SMCWPPP’s FY 2016/17 Annual Report included a workplan developed by BASMAA that describes how these information needs will be accomplished, including the studies to be performed and a preliminary schedule. SMCWPPP’s March 30, 2020 Integrated Monitoring Report includes a summary of the findings and results of the studies completed, planned, or in progress and the implications of the studies on potential control measures to be investigated, piloted, or implemented in future permit cycles.

SMCWPPP is assisting San Mateo County municipalities to comply with the risk reduction program requirements by coordinating with and reporting on the Fish Smart program conducted by San Mateo County Environmental Health Services (EHS). Please see Section 11 above for additional details.

C.13 Copper Controls

Provision C.13 of the MRP addresses copper control measures identified in the San Francisco Bay Basin Water Quality Control Plan (commonly referred to as the Basin Plan) that the Regional Water Board has

deemed necessary to support copper site-specific objectives in San Francisco Bay. SMCWPPP's accomplishments during FY 2021/22 include the following tasks to assist San Mateo County Permittees with implementation of Provision C.13:

- Continued to train municipal inspectors on the MRP requirements and BMPs for architectural copper installation, cleaning, and treating. The trainings utilized a SMCWPPP factsheet entitled "Requirements for Architectural Copper: Protect water quality during installation, cleaning, treating, and washing!" which targets suppliers and installers of copper materials and is available on the SMCWPPP website (flowstobay.com). Municipal construction site stormwater inspectors received the information from a presentation at the SMCWPPP Construction Site Stormwater Inspections Training on March 20, 2022.
- Provided information through the SMCWPPP website, via a fact sheet entitled *Best Management Practices for Pools, Hot Tubs, and Fountain Water Discharges*, and social media posts related to managing discharges from pools, spas and fountains that includes information on avoiding the use of copper-based algaecides.
- Provided information through the SMCWPPP website on ensuring through routine industrial facility inspections that proper BMPs are in place at industrial facilities likely to use copper or have sources of copper.

C.15 Exempted and Conditionally Exempted Discharges

The objective of MRP Provision C.15, Exempted and Conditionally Exempted Discharges, is to exempt unpolluted non-stormwater discharges from the MRP's general non-stormwater discharge prohibition (Provision A.1) and to conditionally exempt non-stormwater discharges that are potential sources of pollutants. SMCWPPP helps municipal staff understand the MRP's requirements and makes various MRP compliance support materials available for their use. SMCWPPP's PIP component conducts selected activities to assist San Mateo County Permittees comply with outreach requirements in Provision C.15.b.iv. (Individual Residential Car Washing Discharge), C.15.b.v. (Swimming Pool, Hot Tub, Spa and Fountain Water), and Provision C.15.b.vi. (Irrigation Water, Landscape Irrigation, and Lawn or Garden Watering).

SMCWPPP performs a variety of activities to assist San Mateo County Permittees with implementation of Provision C.15. SMCWPPP's FY 2021/22 accomplishments included the following:

- Continued outreach efforts through social media posts to encourage residents to use car washes rather than washing their cars at home;
- Continued conducting social media outreach to mobile car wash businesses and residents to educate them on the hazards of dumping their used wash waters down storm drains and related BMPs;
- Using a BMP fact sheet for swimming pools, hot tubs, spas, and fountain water discharges, promoted these types of BMPs through social media posts;
- Continued conducting outreach to San Mateo County residents to support and promote eco-friendly alternatives to toxic pesticides and to help avoid pollutants in stormwater discharges. This promotion took place on social media, during two webinars we conducted, the SMCWPPP newsletter, and blog. Additional messaging was provided through SMCWPPP's point-of-purchase program, where OWOW materials were distributed that educate residents about eco-friendly pesticide alternatives, and via six tabling event at local hardware stores.

- Continued promoting planting of drought tolerant, native vegetation through our online media channels, including social media and the SMCWPPP newsletter and blog. Messaging focused on the environmental benefits of planting native plants, including their tolerance to drought.
- Continued to promote water-conservation tips via social media and wrote a blog that feature water conservation.
- Held a webinar in March 2022 titled “Spring Blooming: Eco-Friendly Weed Management” in which our IPM expert presented about IPM strategies for managing weeds.

SECTION 1

INTRODUCTION

BACKGROUND

This FY 2021/22 Annual Report was developed in compliance with the reissued National Pollutant Discharge Elimination System (NPDES) Municipal Regional Permit (referred to as the MRP)¹ for stormwater runoff discharges from San Mateo County and certain other San Francisco Bay Area communities. It summarizes stormwater management activities implemented by the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP or Countywide Program) in FY 2021/22. SMCWPPP's activities benefit 22 municipal agencies in San Mateo County: 15 cities, five towns, the County of San Mateo, and the San Mateo County Flood and Sea Level Rise Resiliency District (FSLRRD, also referred to as OneShoreline). Each of these agencies also separately submits an individual Annual Report to the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) focusing on that agency's stormwater management activities during FY 2021/22.



The organizational structure of SMCWPPP is shown on Figure 1-1. SMCWPPP is a program of the City/County Association of Governments (C/CAG) of San Mateo County. C/CAG is a Joint Powers Authority (JPA) that addresses issues of regional importance to San Mateo County jurisdictions such as congestion management and water quality. The C/CAG Board of Directors is comprised of a local elected city council representative from each city and town in San Mateo County, a member of the County Board of Supervisors, and representatives from the transit district and transportation authority. A 1993 amendment to the JPA Agreement made C/CAG responsible for assisting San Mateo County municipalities with complying with the municipal stormwater NPDES permit, including its latest incarnation as the MRP. Stormwater management-related activities of C/CAG and its various related committees and workgroups are described below.

C/CAG Board of Directors

Throughout FY 2021/22, the C/CAG Board of Directors received presentations, updates, and took actions on various stormwater-related issues, as summarized below (all C/CAG Board of Directors meeting agenda materials and minutes are available at www.ccag.ca.gov/board-of-directors):

¹NPDES Permit No. CAS612008 (Order No. R2-2015-0049), dated November 19, 2015. The MRP has a five-year term: effective January 1, 2016 and expires December 31, 2020. However, the permit term was administratively extended during the permit reissuance process. July 1, 2022 was the effective date of the reissued permit.

- July 2021 – approved Measure M Strategic and Implementation Plan for 2021/22-2025/26, including 3% increase in countywide stormwater revenue allocation; appointed new C/CAG Executive Director (Sean Charpentier), starting August 1, 2021.
- October 2021 – Received 2021 CASQA Awards presentation on San Mateo Countywide Sustainable Streets Master Plan and SMCWPPP website; received presentation on MRP Tentative Order and summary from Oct 12 and 13 Regional Water Board hearings.
- November – 2021 Received presentation from OneShoreline on program updates; approval of appointment to the Stormwater Committee: Luis Sun, Public Works Director, City of Foster City; approved Resolution 21-84 authorizing Amendment No.2 to Task Order LWA-07 for an additional \$50,000 for on-call support to augment staff transition as needed in FY 2021/22; approved Resolution 21-85 authorizing C/CAG to enter into agreement with Global Philanthropies Partnership designating C/CAG as the project lead on the Climate Resilience Resources Guide: Part I project; received recruitment letter from C/CAG Chair regarding vacant seats on OneShoreline Board of Directors; received testimony from C/CAG Chair on the Tentative Order of the MRP, dated October 13, 2021.
- December 2021 – Received a presentation from San Francisco Estuary Institute on “How Healthy is the Bay?” ; approval of appointment to the Stormwater Committee: Matthew Lee, Public Works Director, City of San Bruno; adopted Resolution 21-92 approving C/CAG appointments to the OneShoreline Board of Directors, including Debbie Ruddock (Coastal), Diane Papan (Central), and Marie Chuang (At-large City); received letter from Countywide Stormwater Program providing public comment on the Tentative Order of the MRP, dated November 16, 2021; received press releases regarding a rain barrel bulk-order distribution event held on November 13, 2021
- January 2022 - Approval of Resolution 22-03 authorizing Amendment No.7 to the agreement with BAWSCA for an additional \$25,000 for an additional bulk order rain barrel campaign in FY2021-22.
- April 2022 – Approval of a Resolution authorizing the C/CAG Chair to execute Amendment No.2 to Task Order URD-02 with Urban Rain Design, extending the Task Order to June 30, 2022 for no additional cost; received update on three topic areas (Micromobility, Stormwater, and Greenhouse Gas Reduction) presented at the 2021 C/CAG Board Annual Forum.
- March 2022 – Approved executing an agreement with Bay Tree Design (\$97,761) for the Resilient San Carlos Schoolyards Project to develop concept designs for integrating GI into school campuses for climate resilience and water quality improvement; received an update on MRP reissuance.
- April 2022 – Annual C/CAG Forum, including a [breakout session](#) discussing stormwater funding shortfall solutions.
- May 2022 – Received draft FY 2022/23 C/CAG Budget, including budget for the Countywide Program.
- June 2022 – Approved Resolution 22-40 authorizing the C/CAG Chair to execute Amendment No. 8 to the Agreement with the Bay Area Water Supply and Conservation Agency for the Rain Barrel and Rain Garden Rebate Program, extending the term to June 30, 2023 and adding an amount not to exceed \$25,000 for FY 2022/23, for a new total contract amount not to exceed \$135,000; approved Resolution 22-41 authorizing the C/CAG Chair to execute Amendment No. 2 to Task Order EOA-13 with EOA, Inc., adding an amount not to exceed \$82,676 for Fiscal Year 2022-23, with a new total amount not to exceed \$1,164,633, for general support to the Countywide

Stormwater Program including FY 2021/22 Annual Reporting and additional on-call support; approved Resolution 22-42 authorizing the C/CAG Chair to execute Amendment No. 2 to Task Order LWA-07 with Larry Walker Associates extending the Task Order to September 30, 2022 for green infrastructure and pollutants of concern load reduction technical support services to the Countywide Stormwater Program for no additional cost; approved Resolution 22-43 authorizing the C/CAG Chair to execute Amendment No. 1 to Task Order SGA-07 with S. Groner Associates, extending the Task Order to September 30, 2022 and adding an amount not to exceed \$10,000, for FY 2022/23, with a new total amount not to exceed \$270,000, for public outreach support to the Countywide Stormwater Program on FY 2021/22 Annual Reporting and web maintenance; approved Resolution 22-44 authorizing the C/CAG Executive Director to execute Amendment No. 1 to Task Order URD-03 with Urban Rain Design for green infrastructure outreach technical support services to the Countywide Stormwater Program, extending the Task Order to September 30, 2022 for no additional cost; approved Resolution 22-45, waiving the Request for Proposals process, consistent with C/CAG's procurement policy, and authorizing the C/CAG Chair to execute a license agreement with Engineering Data Software, Inc. to provide annual property fee assessment support to the Countywide Stormwater Program for an annual amount not to exceed \$25,000 and a total amount not to exceed \$125,000 for the license agreement term set to expire December 31, 2027; approved FY 2022/23 C/CAG Budget, including budget for the Countywide Program.

Program Manager and Stormwater Program Specialist

C/CAG's Program Manager oversees the overall Countywide Program, serving as staff to the C/CAG Board and liaison among San Mateo County municipalities, technical consultants, committees, the Bay Area Stormwater Management Agencies Association (BASMAA) and its successor organization (Bay Area Municipal Stormwater Collaborative), the California Stormwater Quality Association (CASQA), and Regional Water Board staff. The Program Manager represents San Mateo County municipalities at regional and statewide meetings and manages technical consultants that support programmatic activities. C/CAG's Stormwater Program Specialist (Specialist) supports the Program Manager in implementing the Countywide Program. In early September 2021, the prior Program Manager left C/CAG and the Stormwater Program Specialist has been acting in the capacity of the Program Manager overseeing the Countywide Program since then.

Participation in Relevant Regional and Statewide Organizations and Activities

In addition to providing regular staff support, agenda reports, and presentations to the C/CAG Board and the Stormwater Committee, the Program Manager and Specialist participated in the following activities during the FY 2021/22 reporting year:

- BASMAA/BAMSC: BASMAA formally dissolved as a non-profit organization at the end of FY 2020/21 and was succeeded by an informal collaborative called the Bay Area Municipal Stormwater Collaborative (BAMSC). The Program Manager and Program Specialist continued representing the Countywide Program on BAMSC and the Program Specialist started serving as Co-Chair of the BAMSC Steering Committee in January 2022. Program Manager and Specialist participated in Steering Committee meetings and subcommittee meetings and participated in regional collaboration efforts and information sharing. Over the course of the fiscal year the Specialist continued serving as Vice Chair of the Monitoring and Pollutants of Concern Committee and also represented stormwater programs on the San Francisco Bay Regional Monitoring Program (RMP) Emerging Contaminant Work Group (ECWG) and two-day annual meeting in April.

The Program Specialist also transitioned to a member of the Technical Advisory Committee on the Contra Costa Alternative Compliance System project in place of the prior Program Manager.

- CASQA: The Program Manager and Specialist attended and presented at the annual CASQA conference and participated in CASQA's Funding Committee and Legislative Committee and presented on the Countywide Program's Regional Collaborative Program Framework for regional scale stormwater management at the February 1, 2022 Funding Committee.
- San Francisco Estuary Partnership Implementation Committee: The Program Manager continued serving on the committee representing the municipal stormwater perspective, participating in quarterly meetings.
- Green Infrastructure Leadership Exchange: The Program Manager and Specialist continued participating in the Green Infrastructure Leadership Exchange. The Program Specialist also submitted in collaboration with four member agency partners for a Collaborative Grant administered by the GI Leadership Exchange to develop a Climate Resilience Resources Guide to advance integration of climate adaptation in municipal GI programs at a national/North American Level. The project was initiated in January 2022 and the initial draft of the guide was completed by the end of June.
- Presentations/Actions/Activities by the Program Manager / Specialist:
 - Presented on the Sustainable Streets Master Plan outcomes at the Silicon Valley Bicycle Coalition Annual Bike Summit on August 13, 2021: "[Tooling Up Sustainable Streets in San Mateo County](#)".
 - Presented testimony on behalf of the Countywide Program at the October 12 and 13, 2021 San Francisco Regional Water Quality Control Board MRP reissuance hearing.
 - Presented at the 2021 CASQA annual conference on October 27, 2021 as a CASQA Awardee (Outstanding Sustainable Stormwater Project or Program) for the Calm Before the Storm: San Mateo County Sustainable Streets Master Plan.
 - Presented at the 2021 CASQA annual conference on October 27, 2021 as part of the panel Advancing Collaborative Approaches to Regional Scale Stormwater Management focusing on C/CAG's Regional Collaborative Program Framework.
 - Presented at the 2021 CASQA annual conference on October 27, 2021 as part of the panel Co-Funding Stormwater Incentives through "Stacked Incentives" in partnership with the Bay Area Water Supply and Conservation Agency, the San Diego County Water Authority and County of San Diego.
 - Presented to the California Stormwater Quality Association Funding Subcommittee on February 1, 2022 on "Advancing Regional-Scale Stormwater Management in San Mateo County CASQA Funding Subcommittee".
 - Presented testimony on behalf of the Bay Area Municipal Stormwater Collaborative at the May 11, 2022 San Francisco Bay Regional Water Quality Control Board Municipal Regional Permit "MRP 3.0" adoption hearing.
 - Presented at the Bay Area Water Supply Conservation Agency's Water Supply Reliability Roundtable on June 28, 2022, focusing on the Advancing Regional Scale Stormwater Management in San Mateo County project.

- During Fiscal Year 2021/22, C/CAG's Program Manager and Specialist continued working with C/CAG's state legislative advocate to make recommendations for C/CAG's Board to consider position letters and bill amendments on legislation that supports C/CAG's member agencies and the Countywide Program with meaningful and cost-effective stormwater management; C/CAG approved the following during the 2022 legislative cycle - SB 852 (Dodd) Climate Resilience Districts – SUPPORT IF AMENDED; AB 1817 (Ting) PFAS Ban in Textiles – SUPPORT; C/CAG's Stormwater Program Specialist also participated in the CASQA Legislative Subcommittee and tracked CASQA's positions on relevant legislation, including AB 2016 (Rivas) – Water Quality Permits.
- During Fiscal Year 2021/22, C/CAG procured consultant support for federal advocacy services, primarily to pursue federal grants and budget requests through coordination with C/CAG's Congressional district representatives, including a successful district member directed funding request through Congresswoman Jackie Speier's office for \$2.4M in support of the San Bruno Regional Stormwater Project at the Caltrans I-280/I-380 interchange.

Grant-funded Project Activities

The Program Manager and Specialist continued implementing and completed C/CAG's Regional Stormwater Collaborative project funded by a \$200,000 grant from the California Natural Resources Agency and in collaboration with the County of San Mateo's Office of Sustainability and \$100,000 in grant funds from US EPA (Water Quality Improvement Fund). These funds were allocated to Geosyntec Consultants and Craftwater Engineering, in conjunction with additional pro-bono support from American Rivers / Corona Environmental and the WaterNow Alliance to support innovative funding and financing mechanisms for countywide GI investments in San Mateo County. The multi-pronged partnership project is intended to advance implementation of regional-scale, multi-benefit stormwater management in San Mateo County. Regional-scale stormwater management is defined to include large-scale regional retention facilities as well as programmatic implementation of smaller, distributed-scale stormwater facilities such as through the C/CAG's countywide rain barrel / cistern / rain garden rebate and incentive program. The four interrelated project components and associated consultants/partners are summarized below.

1. **Building the Business Case for Regional-Scale Stormwater Management** (Geosyntec Consultants)
 - a. Drivers and Objectives Report - Appendix A of the White Paper: Establishes the "What" in terms of what can be achieved through regional-scale stormwater management through establishing key drivers and associated objectives.
 - b. Business Case Memo - Appendix B of the White Paper: Establishes the "Why" in terms of why C/CAG's member agencies, from a cost-benefit perspective, would benefit from countywide collaboration on regional-scale stormwater management.
 - c. Collaborative Program Framework White Paper: Establishes the "How" in terms of how C/CAG's member agencies, and potentially other stakeholders, can collaborate across jurisdictional lines on regional scale stormwater management.
2. **Prioritizing and Conceptualizing Regional-Scale Stormwater Management Opportunities** (Craftwater Engineering/County of San Mateo)
 - a. Regional Projects Opportunities and Prioritization Analysis - Appendix C of the White Paper: Building from analyses done for the Countywide Stormwater Resource Plan and Sustainable

Streets Master Plan, the regional projects opportunities identification and prioritization analysis looks to find the best opportunities throughout the county for regional-scale stormwater management.

- b. Project Concepts: Five new project concepts were developed with funding from the EPA Water Quality Improvement Fund grant managed by the County, which detail planning level conceptual designs, performance goals and cost estimates for high-priority stormwater capture opportunities throughout the county.
3. **Credit Trading Marketplace Analysis - Appendix D of the White Paper** (American Rivers/Corona Environmental): This project evaluated the potential for creating a stormwater credit trading marketplace in San Mateo County that would allow private developers or C/CAG member agencies to buy and sell stormwater management credits to increase rates of implementation.
4. **Innovative Funding and Financing Analysis - Appendix E of the White Paper** (WaterNow Alliance): This project evaluated innovative funding and financing options for all scales of stormwater management, from large regional capture facilities to small-scale rainwater harvesting rebate and incentive programs, including key considerations when structuring potential funding initiatives to maximize flexibility for implementation on public and private properties.

Additionally, C/CAG staff worked with its selected consultant, Bay Tree Design, to advance the Resilient San Carlos Schoolyards project funded via a \$97,000 grant from the California Resilience Challenge in 2020. The project kicked off at the end of FY 2020/21 and progressed through developing guiding goals and principles for resilient schoolyards, site evaluation and selection, school community engagement including student design workshops and curriculum integration and development of initial base maps for resilient schoolyards concept development at three sites in the San Carlos School District showing how GI can be integrated to help reduce runoff, improve water quality, recharge groundwater, and reduce urban heat islands. The project has a dedicated website on Flowstobay.org - <https://www.flowstobay.org/preventing-stormwater-pollution/in-my-community/schoolyard-greening/resilient-san-carlos-schoolyards/>.

Stormwater Committee

C/CAG's stormwater management-related decisions are generally made in consultation with the NPDES Stormwater Committee. At its November 2012 meeting, the C/CAG Board authorized reconvening this committee to include director-level appointees with decision-making authority for implementing stormwater management programs within San Mateo County municipalities in compliance with requirements in the MRP. The Committee meets on an approximate bimonthly basis (depending on need) on the third Thursday of the month, formerly at the San Mateo County Transit District Office in San Carlos. Consistent with other C/CAG committees and the Board of Directors meetings, the Stormwater Committee has been meeting remotely pursuant to state and local public safety orders related to Covid-19 and the stipulations of AB 361. Public notices for Committee meetings are posted in accordance with Brown Act requirements in C/CAG's designated kiosk located at 555 County Center, Redwood City.

The Stormwater Committee met 11 times during FY 2021/22 (July, August, September, October, November (Special Meeting November 4 and Regular Meeting), January, February, March, April, and June (Special Meeting June 30) to assist with planning and organizing SMCWPPP's stormwater management activities including MRP compliance actions. Appendix 1 includes a table summarizing attendance at the Stormwater Committee meetings held during FY 2021/22. Details on Stormwater Committee meeting

agendas, minutes, and presentations can be found on the Committee's [website](#).

The Stormwater Committee currently has three Ad-hoc Workgroups, including the longstanding MRP 3.0 Implementation Workgroup, the reinstated Funding and Financing Ad-hoc Workgroup (reinstated March 2021), and the newly created Workgroup Advancing Regional Projects, which was established at the February 2022 Stormwater Committee with the responsibilities to advance the development of a Regional Collaborative Program to support regional-scale stormwater management via multi-jurisdictional projects and programmatic implementation of distributed green infrastructure.

The below sections describe the Stormwater Committee's mission statement, membership criteria, and roles and responsibilities.

Mission Statement

The Stormwater Committee provides policy and technical advice and recommendations to the C/CAG Board of Directors and direction to technical committees (described below) on all matters relating to stormwater management and compliance with associated regulatory mandates from the State and Regional Water Boards.

Membership

The Stormwater Committee is comprised of one director-level representative from each San Mateo County municipality, recommended by City/Town/County Managers, with decision-making authority and primary responsibility for implementing stormwater management programs within their jurisdictions, and one non-voting executive management representative from the Regional Water Board staff, all appointed by the C/CAG Board. There are no term limits and members may be removed and replaced as needed.

Roles & Responsibilities

The role of the Stormwater Committee is to provide policy and technical advice, recommendations to the C/CAG Board, and direction to stormwater technical committees on matters related to stormwater management and associated regulatory requirements. While the Stormwater Committee may consider any item reasonably related to stormwater and associated regulatory requirements, the following issues are the primary focus of the Stormwater Committee:

- Review and provide recommendations for SMCWPPP's annual budget as part of the overall C/CAG budget approval process;
- Authorize submittal of countywide and regional compliance documents on behalf of their respective agencies for activities performed via C/CAG through SMCWPPP or the BAMSC Steering Committee;
- Convey relevant program and compliance information and direction to appropriate staff and departments within their agencies;
- Form ad-hoc work groups to address stormwater-related issues on an as-needed basis (e.g., permit reissuance);
- Discuss and provide policy recommendations on stormwater issues, such as:
 - Funding stormwater compliance activities at the local and countywide level;
 - Unfunded mandate test claims;

- Permit appeals and litigation;
- Reissuance of the MRP;
- Permit requirements, especially those related to new and redevelopment, GI, monitoring, and pollutants of concern, including trash, mercury, PCBs, pesticides and emerging contaminants;
- Training and technical support needs for municipal staffs; and
- Legislation and statewide policy issues impacting San Mateo County municipalities.

Technical Advisory Committee and Subcommittees

The Stormwater Committee provides direction to and receives feedback and recommendations from the Technical Advisory Committee (TAC). During FY 2012/13, the TAC transferred its former policy-related functions to the Stormwater Committee and transitioned to a quarterly workshop format. The new format allowed more detailed discussion of MRP compliance topics, including check-ins on what jurisdictions should be focused on in the coming quarter and what should have been accomplished and documented in the preceding quarter. The TAC did not meet in FY 2021/22 but received regular emails from the Program Manager and staff with updates on key permit compliance topics and occasional requests for feedback.

SMCWPPP has established various subcommittees and work groups to the TAC to help implement the different aspects of MRP, as shown on Figure 1-1. The subcommittees and work groups met regularly during FY 2021/22 and are discussed further in the remaining sections of this report.

Flood and Sea Level Rise Resiliency District

[AB 825](#) (Mullin) became law on January 1, 2020, officially revamping the San Mateo County Flood Control District to become the San Mateo County Flood and Sea Level Rise Resiliency District. The FSLRRD is intended to address sea level rise, coastal erosion, flooding, and regional stormwater management. As such, assuming the FSLRRD can secure long-term, sustainable funding during the startup period, it will likely play a key role in helping to design, build, and maintain regional stormwater facilities that will help achieve water quality goals in the MRP. The three-year funding commitment by the County and cities/towns (\$4.5 million over three years) is an important step forward for achieving integrated water management in San Mateo County.

The C/CAG Board appointed the five city/town elected officials to the governing board. The County Board of Supervisors appointed the two supervisors. At its December 2021 meeting, the C/CAG Board approved three appointments to the FSLRRD Board of Directors to fill the Coast, Central and At-large C/CAG-designated seats, which the authorizing legislation specified as the first round of staggered terms. The seven governing board members representing the different geographic areas in the county are:

- North: Donna Colson, City of Burlingame
- Central: Diane Papan, City of San Mateo
- South: Lisa Gauthier, City of East Palo Alto
- Coast: Debra Ruddock, City of Half Moon Bay

- At-Large: Marie Chuang, Town of Hillsborough
- Coast Supervisor: Don Horsley
- At-Large Supervisor: Dave Pine

Len Materman (former San Francisquito Creek Joint Powers Authority Executive Director) was brought on as Chief Executive Officer in May 2020. Information on the FSLRRD can be found at its website, www.oneshoreline.org. The FSLRRD inherits the MRP permittee responsibilities of the prior Flood Control District, with those duties currently contracted to the County Department of Public Works for implementation and reporting. The FSLRRD was included as a replacement permittee under the MRP with its reissuance in 2022.

Municipal Regional Permit Reissuance

The reissued MRP was adopted by the Regional Water Board on May 11, 2022. The reissued permit is referred to as MRP 3.0 (the previous permit was referred to as MRP 2.0). During FY 2021/22, SMCWPPP and San Mateo County Permittee staff continued to participate in the ongoing reissuance process and took a lead role in providing testimony during public hearing workshops on the reissued permit on behalf of SMCWPPP and the Bay Area collective of MRP permittees represented by the Bay Area Municipal Stormwater Collaborative. The process facilitated Regional Water Board, Bay Area countywide stormwater program, and MRP Permittee staff, and representatives from other organizations, working together through an overarching Steering Committee and several workgroups specific to MRP provisions/topics. In FY 2021/22, C/CAG staff and permittee representatives continued engaging in periodic meetings of MRP 3.0 work groups related to new or modified provisions proposed under MRP 3.0 including New Development and Green Infrastructure, Water Quality Monitoring, Trash Reductions, Unsheltered/Homeless Populations, Discharges Associated with Fire-fighting Activities, and more. C/CAG's Program Manager and Specialist continued to play a lead role in negotiations with Regional Water Board staff leading up to the adoption of the permit, especially in the areas of New and Redevelopment / Green Infrastructure, Water Quality Monitoring, and Trash Load Reductions.

On November 16, 2021, C/CAG's Program Specialist submitted a formal comment letter to the Regional Water Board on behalf of the San Mateo County permittees documenting comprehensive comments on the Draft Administrative Order. As noted above, in the role of Co-Chair of the BAMSC, the Program Specialist provided testimony on behalf of all permittees and countywide programs operating under the MRP at the May 11, 2022 adoption hearing for MRP 3.0.

ORGANIZATION OF REPORT

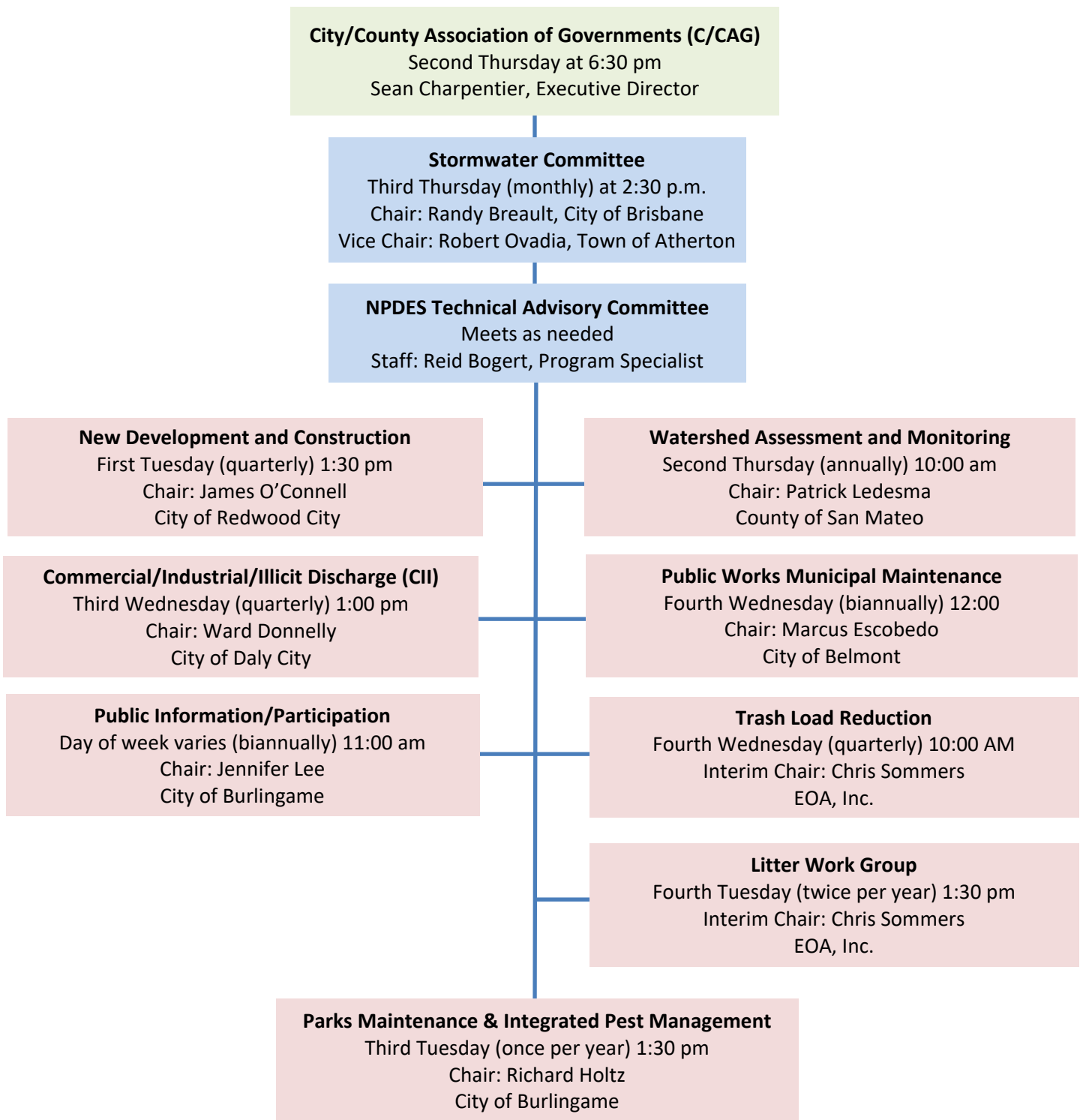
The remainder of this FY 2021/22 Annual Report is structured around the following major provisions of the reissued MRP:

- C.2. Municipal Operations
- C.3. New Development and Redevelopment
- C.4. Industrial and Commercial Site Controls
- C.5. Illicit Discharge Detection and Elimination
- C.6. Construction Site Control

- C.7. Public Information and Outreach
- C.8. Water Quality Monitoring
- C.9. Pesticides Toxicity Control
- C.10. Trash Load Reduction
- C.11. Mercury Controls
- C.12. PCBs Controls
- C.13. Copper Controls
- C.15. Exempted and Conditionally Exempted Discharges

The following sections of this report summarize how SMCWPPP assisted San Mateo County Permittees with implementing the MRP in FY 2021/22 for each of the above provisions. Each section includes three sub-sections: 1) Introduction, 2) Implementation of MRP Actions, and 3) Future Actions.

Figure 1-1. Organizational Structure and FY 2021/22 Meeting Schedule.



SECTION 2

C.2 MUNICIPAL OPERATIONS

INTRODUCTION

The objective of MRP Provision C.2 is “to ensure development and implementation of appropriate Best Management Practices (BMPs) by all Permittees to control and reduce discharges of non-stormwater and stormwater runoff pollutants to storm drains and watercourses during operation, inspection, repair, and maintenance activities of municipal facilities and infrastructure.”

Most MRP-required Provision C.2 Municipal Operations tasks are implemented individually by each Permittee in San Mateo County. The Countywide Program helps agency staff to understand MRP requirements and develops various tools that assist agency staff to effectively plan, implement, and report on compliance activities. SMCWPPP’s assistance and the implementation of Municipal Operations tasks are coordinated through the SMCWPPP Public Works Municipal Maintenance Subcommittee.

IMPLEMENTATION OF MRP PROVISIONS

SMCWPPP performs a number of tasks to assist San Mateo County Permittees with implementation of Provision C.2, with input and assistance provided by the Public Works Municipal Maintenance Subcommittee. FY 2021/22 accomplishments included the following:

- Held two Public Works Municipal Maintenance Subcommittee meetings; and
- Updated a pesticide tracking template, in coordination with SMCWPPP’s Parks Maintenance and IPM Work Group, to assist San Mateo County Permittees to comply with pesticide tracking and reporting requirements in MRP Provision C.9.a.

More information on each of these accomplishments is provided below.

Public Works Municipal Maintenance Subcommittee

The Public Works Municipal Maintenance Subcommittee provides the opportunity for sharing information about municipal operations related MRP requirements and methods for achieving compliance. The meetings provided a forum to share experiences with implementing MRP provisions and applying associated BMPs related to activities such as:

- Street and road repair maintenance activities;
- Sidewalk/plaza maintenance and pavement washing;
- Graffiti removal;
- Corporation yard activities; and
- Stormwater pump station monitoring and inspections.

Marcus Escobedo from the City of Belmont continued to chair the Subcommittee during FY 2021/22. The Subcommittee generally meets twice during each fiscal year. The Subcommittee met in March and June 2022, with good participation by municipal staff, as shown by the attendance list (Appendix 2).

Countywide Program staff also facilitated discussions at meetings about a variety of pertinent topics, including mosquito and vector control coordination, illicit discharges in creeks, water conservation regulations, and with the reissued MRP being adopted in May 2022, proposed changes to requirements in Provision C.2 Municipal Operations based on the Tentative Order, revised Tentative Order, and subsequent adopted MRP 3.0.

Program Materials

Since the first version of the MRP was adopted in 2009, SMCWPPP staff has developed a variety of materials to assist municipal maintenance agency staff with implementing Provision C.2. These materials are all available on the SMCWPPP website (flowstobay.org) and continue to be useful tools that assist agency staff to achieve permit compliance. The materials are described below.

In FY 2009/10, SMCWPPP developed a Stormwater Pollution Prevention Plan (SWPPP) template for use by San Mateo County Permittees in tailoring, updating, or creating SWPPPs for their corporation yards, satellite facilities, and maintenance facilities.

In FY 2010/11, SMCWPPP prepared the “Municipal Corporation Yard Inspection Form.” This form provides detailed checklists for the types of BMPs recommended in the corporation yard SWPPP template. During FY 2010/11, SMCWPPP also prepared “Sources of Stormwater BMP information for Maintenance Activities Listed in MRP’s Provision C.2,” to assist San Mateo County Permittees with complying with the following Provision C.2 requirements: Provision C.2.a. Street and Road Repair and Maintenance; Provision C.2.b. Sidewalk/Plaza Maintenance and Pavement Washing; Provision C.2.c. Graffiti Removal; and Provision C.2.f. Corporation Yards. The sources of BMP information used to develop these materials were CASQA’s Stormwater BMP Handbook Municipal and Caltrans’ Storm Water Quality Handbook Maintenance Staff Guidance.

Also during FY 2010/11, SMCWPPP developed the “Stormwater Pump Station Dry Season DO Monitoring and Inspection Form” to assist San Mateo County Permittees in developing a systematic and efficient way to collect dissolved oxygen (DO) monitoring and inspection information. The following twelve agencies in San Mateo County operate stormwater pump stations: Cities of Belmont, Burlingame, East Palo Alto, Foster City, Menlo Park, Millbrae, Pacifica, Redwood City, San Carlos, San Mateo, and South San Francisco, and the San Mateo County FCSLRRD.

In FY 2015/16, SMCWPPP developed a trash full capture device inspection and cleaning field form template, a Small Full Capture Device O&M Standard Operating Procedure (SOP), a Hydrodynamic Separator O&M SOP, and a Trash Full-Capture Device O&M Verification Program Template and Guidance document. These materials were developed in coordination with the Trash Subcommittee to help municipal staff comply with new requirements in MRP Provision C.10.b.i., Full Trash Capture Systems. These requirements include certifying that trash full capture systems are operated and maintained to meet full trash capture system requirements and keeping associated maintenance records.

In FY 2016/17, SMCWPPP developed a trash full capture device inspection and cleaning data tracking Microsoft Excel template to assist with tracking and reporting requirements in MRP Provision C.10.b.i. Also in FY 2016/17, SMCWPPP developed a template in Excel to assist with pesticide tracking and reporting requirements in MRP Provision C.9.a. The pesticides tracking template utilizes a lookup list of pesticides and active ingredients compiled from data tables available on the Department of Pesticide Regulation (DPR) website. In coordination with the Parks Maintenance and IPM Work Group, the template was updated during FY 2021/22 with the current two years of pesticide product data from the DPR website.

FUTURE ACTIONS

FY 2022/23 activities planned by SMCWPPP to assist San Mateo County Permittees understand and comply with requirements in Provision C.2 of the reissued municipal stormwater permit (MRP 3.0) include the following:

- Continue holding two Public Works Municipal Maintenance Subcommittee meetings;
- Update tracking templates and guidance materials, as needed;
- Assist with developing maintenance training materials and/or workshops; and
- Coordinate with SMCWPPP's New Development Subcommittee to provide guidance on GI maintenance and related training materials.

SECTION 3

C.3 NEW DEVELOPMENT AND REDEVELOPMENT

INTRODUCTION

This section describes SMCWPPP’s activities to assist municipal agencies in San Mateo County to comply with MRP Provision C.3, New Development and Redevelopment. SMCWPPP continued to provide compliance assistance with MRP Provision C.3 (and Provision C.6 Construction Site Controls – see Section 6) through the New Development Subcommittee (NDS). SMCWPPP also obtained input and direction from agency representatives through the NDS. During FY 2021/22, James O’Connell with the City of Redwood City continued to chair the NDS. The NDS met four times in FY 2021/22 with good participation by municipal staff, as shown by the attendance list (Appendix 3).

In support of the Green Infrastructure (GI) Plan requirement in the MRP and to help advance the most cost-effective and maximum benefit stormwater projects in San Mateo County, C/CAG completed the Advancing Regional-Scale Stormwater Management in San Mateo County Project in January 2022. This multi-pronged project set out to achieve four main objectives: 1) develop a business case for regional stormwater management in the county, addressing the “what”, “why” and “how” of delivering cost-effective multi-benefit green stormwater infrastructure at a regional scale (including regional capture and programmatic distributed green stormwater infrastructure); 2) identify and prioritize the next round of opportunities for regional multi-benefit stormwater capture projects and develop five project concepts for the highest performing regional project sites across multiple drivers from the countywide analysis; 3) conduct a credit trading market feasibility analysis for supply and demand conditions under MRP 3.0 Regulated Projects conditions in San Mateo County; and 4) evaluate innovative funding and financing options for advancing countywide green stormwater investments. The four components of the project culminated in a [Regional Collaborative Program Framework White Paper and Appendices](#), laying the foundation for establishing the initial phase (and future phases) of a cost-sharing/market-based program for regional stormwater management. This project was funded with \$200,000 from a State General Fund Grant administered by the California Natural Resources Agency awarded to C/CAG in 2019 and \$100,000 from a US Environmental Protection Agency Water Quality Improvement Fund awarded to the County Office of Sustainability, also in 2019. Additionally, C/CAG continued its collaboration with the Cities of Redwood City, Belmont, San Bruno, the County of San Mateo, and the California Natural Resources Agency, leveraging the same grant sources mentioned above, to advance design and environmental documentation for three multi-benefit regional-scale stormwater capture projects. Notably, the first regional project in the County was completed in June 2022 at Orange Memorial Park in the City of South San Francisco and will have a one-year commissioning period to evaluate initial operations and maintenance activities and costs. C/CAG also expanded its partnership with the Bay Area Water Supply and Conservation Agency (BAWSCA) to provide two bulk order rebate campaigns in partnership with a bulk distributor (RainWater Solutions) and partner agencies/organizations to host in-person distribution

events in November and January and continued its new tiered rain barrel program and new incentives for incorporating rain gardens in lawn replacement projects. Coordinating with schools and the County Office of Education, C/CAG made significant progress with its Resilient San Carlos Schoolyards project under a \$97,000 grant from the Bay Area Council's California Resilience Challenge Grant to develop schoolyard greening concepts for three sites in the San Carlos School District, completing the engagement process and initial concept base maps in June. C/CAG also funded several rain barrel installations at schools throughout the county and supported a full rain garden design and installation at Belle Haven Elementary School in Menlo Park. Lastly, C/CAG was successful in applying for funding under the Green Infrastructure Leadership Exchange Partnerships Grant Program and led the project team for the development of a Climate Resilience Resources Guide to support climate adaptation in GI programming throughout the nation.

IMPLEMENTATION OF MRP PROVISIONS

SMCWPPP's accomplishments during FY 2021/22 include the following tasks to assist San Mateo County municipalities with implementation of Provision C.3:

- Held four meetings of the NDS to assist municipal agencies in San Mateo County to comply with MRP Provisions C.3 (New Development and Redevelopment) and C.6 (Construction Controls). Each meeting was well attended (see Appendix 3 for the FY 2021/22 NDS attendance record).
- SMCWPPP's facilitation of the NDS meetings and related review of work outside of the meetings allowed SMCWPPP to help advance key elements of San Mateo County Permittee GI Plans, including the adoption of new GI-related policies, review of proposed project opportunities and concepts, and implementation of C.3 requirements.
- Completed a significant update to the C.3-C.6 Development Review Checklist, including the addition of new data pages to the Excel and PDF-form versions of the document to improve tracking of GI and LID.
- Participated in the BAMSC Development Subcommittee¹ and coordinated fall and spring meetings of the BAMSC Development Subcommittee BSM Tree-Design Work Group.
- Continued promoting the Green Infrastructure Design Guide (GI Design Guide) for use by San Mateo County Permittees and external partners. The GI Design Guide includes broad guidance on the design and implementation of various green stormwater infrastructure treatment measures and typical details and standard specifications for numerous GI design options and settings.
- Conducted a variety of GI outreach activities, including promotion of a rain barrel and rain garden rebate program paired with two bulk order rain barrel distribution events, publishing newsletter articles, and posting on social media. C/CAG staff also attended classroom presentations and participated in efforts to engage schools via programs led by the San Mateo County Office of Education, including acting as a community partner in last year's [Sustainable Watersheds](#) teacher fellowship program and the new [Sustainable and Climate Ready Schools Initiative Partnership](#) in the water focus area. C/CAG staff also supported local and regional implementation of GI through four presentations at the 2021 California Stormwater Quality Association (CASQA) Annual

¹ The Bay Area Stormwater Management Agencies Association (BASMAA) dissolved as a formal non-profit organization in 2021, but its members continue to meet as an informal organization called the Bay Area Municipal Stormwater Collaborative (BAMSC). The BASMAA Development Committee was renamed the BAMSC Development Subcommittee and continues to meet approximately quarterly.

Conference in October 2021, including two awards for the Sustainable Streets Master Plan and the www.flowstobay.org website as well as two panel presentations on the Advancing Regional Scale Stormwater Management in San Mateo County project and on Co-funding Stormwater Incentives Through “Stacked Incentives” focusing on rainwater harvesting and rain gardens; a presentation on the San Mateo County Sustainable Streets Master Plan at the Annual Silicon Valley Bike Summit in August 2021; two additional presentations on C/CAG’s regional scale stormwater management approach at the February 1, 2022 CASQA Funding Subcommittee and the June 28, 2022 Bay Area Water Supply Conservation Agency’s Regional Water Supply Reliability Roundtable; two presentations focusing on C/CAG’s multi-scale green infrastructure strategy at the February 16, 2022 California Municipal Finance Officers meeting and the July 14, 2022 CASQA Quarterly Meeting; and a presentation on the GI Exchange Grant Funded Climate Resilience Resource Guide at the Exchange’s April 2021 Planning and Resilience Learning Circle. C/CAG staff has also stayed engaged in other regional and statewide efforts, including staying involved in the Green Infrastructure Leadership Exchange, co-chairing the Bay Area Municipal Stormwater Collaborative (BAMSC) Steering Committee, and working with state legislators to support regional scale stormwater projects. Notably, C/CAG staff were successful in a member-directed spending request through Congresswoman Jackie Speier’s office for \$2.4M in additional funding towards the San Bruno I-280/I-380 regional project, which has passed the House and is awaiting approval from the Senate. Other outreach on GI included maintaining the redesigned flowstobay.org website, which includes several webpages focused on raising awareness about GI in San Mateo County, as well as continuing piloting a Green Streets Stewardship Program in partnership with the Master Gardeners of San Francisco and San Mateo Counties to help maintain public GI and provide engagement opportunities for Master Gardener volunteers. Lastly, C/CAG’s partnerships with schools has expanded in the last year with new pilot projects at [six school sites](#) (totally nine since 2020/21).

Additional details about the above accomplishments are provided below.

C.3 Implementation and Outreach Products

With the assistance of the NDS, SMCWPPP developed, updated and/or assisted with the following technical and outreach products:

- [Composted Wood Mulch for Biotreatment Area Specification](#) – SMCWPPP continued to promote the new specification and guidance for a composted wood mulch product for biotreatment areas that was completed in June 2021. The list was posted on the SMCWPPP [website](#) in August of 2021.
- [O&M Templates](#) – SMCWPPP updated the templates for Operation and Maintenance Agreements in January 2022 and posted them on the public and permittee-only pages of the SMCWPPP [website](#).

New Development (C.3) Workshops

The FY 2020/21 New Development Workshop was originally scheduled for June 2021 but was postponed until August 2021. SMCWPPP also held the FY 2021/22 New Development Workshop in June of 2022.

- The August 2021 workshop was held via Zoom and was attended by 85 municipal staff and consultants. The topics discussed included C.3 regulatory basics, expected MRP 3.0 requirements, GI projects around the Bay, pervious pavement, GI maintenance issues, regional GI facilities, tree-based stormwater treatment, GI feasibility tools and biotreatment soil media submittal

procedures. The presentations, attendance record, and evaluation summary are included in Appendix 3 and are posted on the SMCWPPP [website](#).

- The June 2022 workshop was held via Zoom and was attended by 57 municipal staff and consultants. The topics discussed included C.3 regulatory basics, new development-related requirements in MRP 3.0, the City of Burlingame's O&M tracking and inspection [program](#), and maintenance of bioretention measures. The presentations, attendance record, and evaluation summary are included in Appendix 3 and posted on the SMCWPPP [website](#). For the first time, video recordings of the presentations were made and posted on members only training page of the SMCWPPP website for permittee use.

Green Infrastructure Outreach

During FY 2021/22, SMCWPPP continued performing a variety of GI-related outreach, including the following efforts:

- Promoted the [Green Infrastructure](#), [Green Infrastructure Story Map](#), [Green Infrastructure Design Guide](#), and [Rain Garden](#) pages on the redesigned SMCWPPP website ([flowstobay.org](#)).
- Partnered with BAWSCA to promote the countywide rain barrel program. The supporting Rain Barrel outreach campaign received 324 rebate applications from residents (a 391% increase from FY 20/21) for a total of 541 rain barrel installations (415% increase from FY 20/21). Over 2,600 rain barrels have been installed to-date in San Mateo County under the rebate program.
- Launched a bulk rain barrel pilot program in partnership with RainWater Solutions to provide County residents an opportunity to obtain high-quality, lower-cost rain barrels. The program distributed 726 barrels to 420 San Mateo County residents in 17 out of the County's 20 incorporated jurisdictions, as well as resident in unincorporated areas.
- Partnered with BAWSCA to promote rain garden rebate as part of the Lawn Be Gone! Rebate. Launched a campaign to promote the rebate, which included a webinar. Results of the campaigns include one rain garden rebate, one rain garden webinar with 58 attendees, one rain garden in-person event with five attendees, and 27,042 total reach on social media posts.
- Sent 9 (of 21 total) e-newsletters to a list of 4,065 active, opt-in subscribers with topics featuring GI, such as water-wise gardening tips and rain barrel/rain garden installation guidance and resources. Gained 483 new email subscribers and had an average open rate of 49.6%.
- Developed a four-part video series focusing on GI at different scales in San Mateo County, including Overall GI, Sustainable Streets, Schools, and Homes.
- Partnered with and promoted the San Mateo County Office of Education's Teacher Fellowship with a focus on Sustainable Watersheds and advancing green stormwater infrastructure curriculum and project implementation at schools. Two teachers completed the fellowship, reaching a total of 68 students, grades K to 12.
- Continued the development of SMCWPPP's Greening Schoolyards Program and supported and facilitated the on-campus installation of five rain barrels, one rain garden, and conducted six classroom lectures to teach students about watersheds and rainwater capture.
- Continued the development of SMCWPPP's Green Street Stewards Pilot Program meant to support current and ongoing GI facility maintenance needs across different jurisdictions while also engaging and educating residents, students, and community groups on the function and value of green infrastructure.

- Participated in 20 public outreach and citizen involvement events. Of the 20 events, 15 were focused on GI at home or general GI information, including a “Rain Barrels 101” webinar, “Rain Gardens 101” webinar, five in-person Green Streets Stewardship events, five in-person rain barrel installation workshops, and one in-person rain garden installation event. Also launched a bulk rain barrel program and held two in-person distribution events. In total, these events had 544 attendees.
- Promoted outreach messaging to residents regarding GI via social media channels, including Facebook and Instagram. For example: “Have you heard of the term 'green infrastructure'? It's a pretty broad term used to describe a cost-effective way of capturing and cleaning water in a way that mimics natural processes, such as using native plants to filter water. Here in San Mateo County, green infrastructure has been integrated with the Safe Routes to School bike program and pedestrian enhancement as part of a pilot program. Read more here: https://bit.ly/About_Green-Infrastructure.”

San Mateo Countywide Stormwater Resource Plan

In response to the State’s legislative mandate for Stormwater Resource Plans in order to compete for voter-approved bond funds, C/CAG worked with its member agencies to develop the [San Mateo County Stormwater Resource Plan](#) in 2017. The plan utilized various metrics to prioritize opportunities for stormwater capture at varying scales. Since that time, San Mateo County Permittees have been working to advance implementation of stormwater management measures at three primary scales:

- 1) the parcel scale, where only the rain falling on a site is managed (primarily new and redevelopment projects);
- 2) the street scale, where stormwater runoff from public roadways and sidewalks and adjacent parcel run-on to the streets is managed via green street features; and
- 3) the regional scale, where runoff from watershed or drainage areas is managed in large, centralized facilities.

In FY 2021/22, C/CAG staff and its member agencies have advanced the original outputs from the Stormwater Resources Plan by advancing partnerships with schools on pilot projects and schoolyard greening concept plans; building on its existing rain barrel rebate program partnership; advocating for funding on Sustainable Streets Projects (at the state and local level, as well as through grants); seeing through the completion of the Orange Memorial Park Regional Project and advancing new opportunities for regional stormwater capture through C/CAG’s and the County’s efforts on the recently completed Regional Collaborative Program Framework White Paper.

Reasonable Assurance Analysis (RAA) for Green Infrastructure and Regional Collaborative Program Development

As required under Provisions C.11 and C.12, C/CAG developed a countywide pollutant transport/hydrology model coupled with GI scenario modeling to provide Permittees with quantitative details on how much GI would be needed spatially to meet the MRP 2.0 goal for PCBs load reduction via GI by 2040. The RAA helped Permittees recognize:

- 1) The rate of GI implementation via new and redevelopment is generally outside the control of municipalities, but the extent of projects subject to stormwater requirements is governed by both MRP and local requirements;

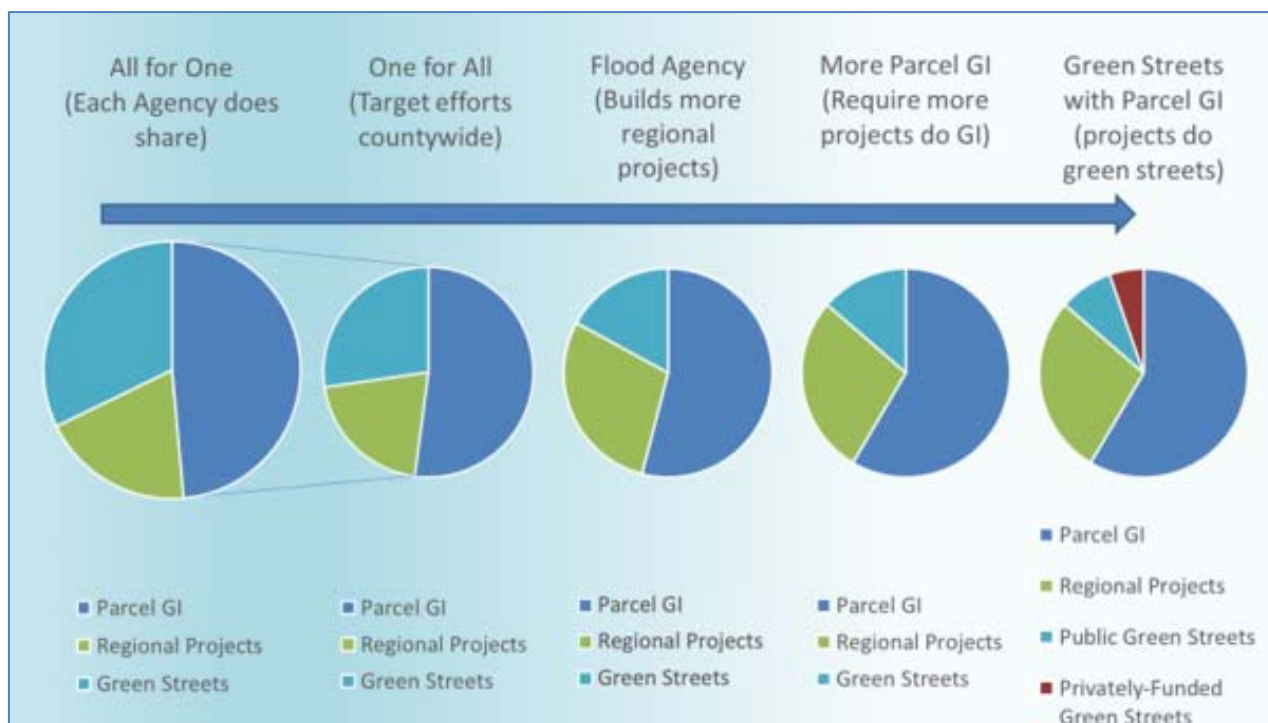
- 2) Meeting GI and stormwater treatment targets on a countywide basis instead of proportionally within each jurisdiction can result in overall cost savings by implementing projects where it makes most sense;
- 3) Regional-scale projects, while costly, can be very cost effective in terms of the overall volume managed vs. equivalent levels of small-scale distributed systems, especially with regard to operations and maintenance. These larger scale projects can also provide other significant benefits such as flood risk reduction and water supply augmentation, and are often competitive multi-benefit/multi-jurisdictional projects for state and federal grant programs; and
- 4) Green street implementation is likely to be the most impactful on local Permittee resources, both for capital expenses and long-term operations and maintenance given that it is most likely to be funded by the limited local allocations of transportation dollars and result in many distributed bioretention facilities requiring ongoing maintenance. This contrasts with parcel-scale projects funded primarily by private developers or regional-scale projects likely to be funded by significant state or federal grants due to the integrated, multi-benefit nature.

As a result, C/CAG and its member agencies began looking at options to meet water quality and treatment requirements while reducing the financial burden of green streets on local agencies when evaluating approaches for meeting long-term water quality goals. As detailed in Figure 3-1 (moving from left to right, focus is on increasing cost-effectiveness), key strategies include:

- 1) Working collaboratively at a countywide and/or watershed scale instead of jurisdiction by jurisdiction;
- 2) Working with the new San Mateo County Flood and Sea Level Rise Resiliency District (OneShoreline) to advance regional-scale stormwater capture projects to the greatest extent possible to help with flooding, climate resiliency, and water quality;
- 3) Increasing the number of new and redevelopment projects subject to stormwater treatment requirements to get more parcel-scale GI by targeting key development sectors not addressed by MRP triggers;
- 4) Increasing implementation of green street projects in conjunction with new and redevelopment to get more street-scale projects built and maintained via private funding; and
- 5) For public green street investments, integrating GI with planned transportation improvements when and where it makes sense to create multi-benefit projects.

From the RAA conclusions that regional scale stormwater management more cost-effectively achieves the MRP 2.0 goal for PCBs load reduction via GI by 2040, C/CAG has focused its efforts over the past year in partnership with the County Office of Sustainability and OneShoreline, leveraging state and federal grant funds, to create a framework for a Regional Collaborative Program geared towards multi-benefit regional-scale stormwater management in the county. Though the focus on the Regional Collaborative Program Framework is on regional capture projects, the other scales of GI implementation could easily be incorporated into a countywide stormwater “crediting” or market-based program once established. The following sections detail the status of efforts to make progress on a regional approach to multi-scale GI implementation and the interconnections of the five strategies outlined above.

Figure 3-1. Strategies for Cost-Effective Stormwater Management



Regional-Scale Stormwater Management and Countywide Collaboration

Since the Stormwater Resource Plan, SMCWPPP has helped shepherd several regional projects through initial planning, concept design and engineering (as well as construction in the case of South San Francisco’s Orange Memorial Park project). The following summarizes the status of the current regional projects underway in San Mateo County.

South San Francisco (Orange Memorial Park)

This project, which is the first of its kind in the Bay Area, was substantially completed in June 2022 and will provide water quality improvements to help meet the MRP requirements related to mercury, PCBs, and trash, and potentially new requirements in the reissued permit (MRP 3.0) for retrofit of quantified amounts of green infrastructure not already defined as a Regulated Project pursuant to Provision C.3.b. The project includes an instream diversion and pre-treatment structure (trash screen and sediment removal chamber) in the upper end of the Colma Creek flood control channel within Orange Memorial Park. Pretreated water gravity drains to an underground stormwater reservoir where it is stored until either infiltrating or being further treated for direct non-potable reuse (i.e., irrigation). When storage capacity is exceeded, treated overflow is discharged back into the channel. Originally conceptualized in the Stormwater Resource Plan, the project will divert approximately 16% of the annual drainage from approximately 6,500 acres of land primarily in the City of South San Francisco, Town of Colma, the City of Daly City, and a portion of unincorporated San Mateo County, of which 9% will be treated to remove trash/sediment before being returned to the channel, 6% infiltrated into the Westside groundwater basin (approximately 240 acre-feet/year), and 1% treated and used onsite and in nearby linear parks for irrigation purposes (approximately 45 acre-feet/year). The project is anticipated to capture 100 tons of sediment, 10 grams of PCBs, and 30 grams of mercury, annually. The project was funded through a

\$15.5M Cooperative Implementation Agreement with Caltrans to help satisfy its pollutant load reduction requirements, focusing on trash load reductions.

Belmont Project (Twin Pines Park)

The Belmont project was originally conceptualized in the Stormwater Resource Plan as a small-scale regional facility capturing runoff from a small neighborhood. Since then, the Cities of Belmont and San Carlos and the County of San Mateo, through its Flood Resilience Program (now the San Mateo County Flood and Sea Level Rise Resiliency District, also called OneShoreline), jointly developed a Watershed Management Plan for Belmont Creek. In this plan, the Twin Pines Park project was increased in scale to be comparable to the other regional projects (~20 acre-feet of storage capacity), with an underground storage/infiltration gallery conceptualized beneath the Twin Pines Park parking lot. In early 2020 C/CAG, in conjunction with the California Natural Resources Agency, allocated \$913,000 of a \$2.94M State budget allocation to advance regional stormwater projects in San Mateo County to the Belmont project for preliminary design and environmental review. At the same time, OneShoreline was also successful in applying for Department of Water Resources grant for \$1M to restore Belmont Creek within Twin Pines Park as a joint project. In FY 2021/22, the City of Belmont issued a joint Request for Proposals for design and construction services on both projects concurrently, leveraging an additional ~\$6M grant from the California Natural Resources Agency received in early 2022. The City has contracted for design and construction services on both the stormwater capture and the creek restoration project and has committed funding through the full design of each project. The City is working on identifying additional funds to construct the projects.

San Bruno Project (I-280/380 Interchange)

Subsequent to the project concepts developed for the Stormwater Resource Plan, C/CAG worked with its member agencies to develop additional regional project concepts to help reduce the potential green streets burden on cities indicated as needed by the RAA modeling to meet the MRP 2.0 goal for PCBs load reduction via GI by 2040. San Bruno had identified the need for retention within the Crestmoor Canyon watershed to address storm drain system capacity deficiencies. Ultimately, C/CAG and the City collaborated to conceptualize an approximately 20-acre-foot regional underground stormwater capture facility on Caltrans property within the large vacant land area within the I-280/380 interchange. Similar to the Belmont project, C/CAG worked with the Natural Resources Agency to provide \$913,000 to San Bruno for preliminary design and environmental review for the project. In addition, the County of San Mateo received a U.S. EPA Water Quality Improvement Fund (WQIF) grant under which \$200K was provided to the San Bruno project for preliminary design, for a total of \$1.13M between the two funding sources. San Bruno participated in the joint Request for Proposals process with C/CAG, Redwood City, and the County of San Mateo and has contracted with a design consultant and executed a project oversight cooperative agreement with Caltrans. The City has currently progressed through the pre-design phase with geotechnical, utility surveys, and other preliminary design studies completed as part of the Caltrans Project Study Report-Project Development Support (PSR-PDS) document. The City has also coordinated on expectations for future ownership of the project and operations and maintenance needs, should the project get built, to support entering into a new cooperative agreement for the Project Approval & Environmental Documentation (PA&ED) phase. Concurrently, the City is developing the Design Standards Decision Document to advance the environmental and engineering studies as part of this next phase. C/CAG has worked over the past year with its federal legislative advocate to secure a member-directed spending request through Congresswoman Jackie Speier's office for an additional \$2.4M towards the project approval and environmental review phase of the project.

Redwood City Project (Red Morton Park)

Like the San Bruno project, C/CAG worked with Redwood City staff to identify a regional project opportunity to help the City reduce its potential green streets burden to meet the MRP 2.0 goal for PCBs load reduction via GI by 2040, identified through the RAA modeling. A two-phase project was conceptualized for Red Morton Park, with underground storage systems proposed beneath two playing fields, with a combined storage capacity of ~43 acre-feet. As with the San Bruno and Belmont projects, C/CAG worked with the Natural Resources Agency to provide \$913,000 to do preliminary design and environmental review. Redwood City also participated in the joint Request for Proposals process and has contracted with a design consultant. Like San Bruno, the County of San Mateo is providing an additional \$200,000 from its U.S. EPA grant for preliminary design, for a total of \$1.13M between the two funding sources. The preliminary design report identified three primary potential project alternatives: one that is sized to treat the 85th percentile design storm (9.5 acre-feet of storage capacity); one that maximizes the size of the storage beneath the first playing field (23.5 acre-feet of storage); and a third that maximizes potential storage, including additional storage beneath the second field (30 acre-feet of storage). Based on further consideration of the preliminary design report, the City has since approved advancing design work for the maximized single field alternative. Earlier this year, the City received the 30% designs for the single field project alternative and will be advancing 60% designs in the near future. Due to elevated groundwater levels, the project is not expected to be able to provide for infiltration of captured water and instead focuses on storage and treatment for return to the storm drain system. Additional project alternatives, including capability to utilize captured water for onsite irrigation and toilet flushing, diversion to sanitary sewer, permeable pavement in the adjacent parking lot, and a recirculating surface stream have also been evaluated, and the project shows promise for stormwater capture and use for onsite direct non-potable use after treatment.

Regional Project Planning and Collaborative Framework

As mentioned above, C/CAG worked with its state legislative delegation to secure a \$3M (\$2.94M after deducting the State's administrative costs) grant to advance regional stormwater capture opportunities and a coordinated programmatic approach to regional distributed GI implementation. The bulk of those funds were allocated to initial design and environmental review of the Belmont, San Bruno, and Redwood City regional projects, described above. C/CAG directed the remaining funds (\$200,000) from the state budget allocation to a collaborative effort to further advance regional-scale stormwater management opportunities in San Mateo County. With oversight and input on the project deliverables through a Technical Advisory Group, including representatives from C/CAG's member agencies, OneShoreline, the Bay Area Water Supply Conservation Agency, Silicon Valley Clean Water and the Regional Water Quality Control Board, C/CAG completed the multi-part project culminating in the Regional Collaborative Program Framework White Paper in January 2022. The core components of the project included: 1) developing drivers and objectives for regional-scale stormwater management and a business case and collaborative framework for San Mateo County Permittees (and other potential project partners) to work together to share costs and benefits of these large-scale regional projects; 2) conducting a countywide analysis of regional capture project opportunities and ranking opportunities based on key performance indicators that map onto the selected multi-benefit drivers and objectives; 3) developing preliminary design concepts and cost estimates for the five highest performing sites from the analysis (note – this portion of the project was funded by a portion of the County's EPA Water Quality Improvement Fund grant); 4) conducting a countywide credit trading feasibility analysis focused on evaluating the market feasibility for Regulated Projects to participate in an off-site alternative compliance/credit trading program; and 5) developing an innovative funding and financing report to support further exploring options in San Mateo County for GI investments countywide, and how funding and financing options might be integrated into a

Regional Collaborative Program. Each of the above parts of the project were integrated into the final project output, which was a Regional Collaborative Program Framework White Paper and its appendices. While the drivers and objectives are intended to address “what” can be achieved through regional-scale stormwater management, the business case and collaborative framework will address “why” San Mateo agencies may want to work collaboratively and “how” that collaboration could be achieved. The collaborative framework lays out the foundation for developing a collaborative approach to regional stormwater management in San Mateo and draws on lessons learned from the alternative compliance framework San Pablo is developing with Contra Costa County partners under another EPA WQIF grant. The final project deliverables are available on the dedicated Regional Collaborative Program website – www.flowstobay.org/regional-collaborative.

Collectively, this multi-pronged effort addresses the strategies in Figure 3-1 of working collaboratively at a countywide scale rather than jurisdiction by jurisdiction and maximizing regional-scale multi-benefit stormwater capture opportunities.

Parcel-Scale Stormwater Management

Expanded New/Redevelopment Requirements

An increasing number of San Mateo County Permittees are subjecting currently non-regulated new and redevelopment projects to stormwater management requirements. This effort to go beyond what is currently required in the MRP. It is intended to help meet the long-term goals of stormwater quality improvements and greening of infrastructure while lessening the financial burden to the municipalities. For example, Redwood City requires substantial commercial remodels and any new commercial or residential building to incorporate stormwater treatment measures sized in accordance with Provision C.3. Atherton, with the adoption of its Green Infrastructure Plan, requires full-site single family residential development projects that create or replace 10,000 square feet of impervious area to incorporate C.3-sized stormwater treatment measures. C/CAG has supported agencies following suit by providing details on these types of approaches to all member agencies for consideration. These tools and resources are available via the San Mateo Countywide Sustainable Streets Master Plan.

Rainwater Harvesting Rebates/Incentives

C/CAG has been partnering with BAWSCA to implement a joint rebate/incentive program for rainwater harvesting since late 2014. Under this program, C/CAG has provided a countywide rebate of \$50/barrel that is matched by many of the water purveyors in the county. Starting FY 2020-21, C/CAG expanded its incentives to provide rebates for larger storage systems, offering \$100 for systems between 100-199 gallons and \$150 for over 200 gallons, all of which continue to be combined with \$50/system rebates from participating water purveyors. In addition, C/CAG added a new stacked \$300 rain garden incentive on top of rebates from participating water purveyors for BAWSCA’s “Lawn Be Gone!” turf replacement program. New to the program in FY 2021-22, C/CAG piloted two bulk order rebate campaigns, offering a discounted rain barrel on pre-order through a partnership with RainWater Solutions. Between two events, C/CAG helped distribute nearly 730 rain barrels to residents throughout the county. Over 2,700 rain barrels have been installed to date in San Mateo County under the rebate program. As part of the rain garden incentives program, C/CAG partnered with the Master Gardeners and University of California Extension to implement the second year of pilot Green Streets Stewardship Program to help raise awareness about GI in the county and to help municipalities ensure their facilities are properly maintained. Since 2020 when the pilot program began, the Master Gardeners have led nine stewardship events at two locations coinciding with the Safe Routes to School and Green Streets Infrastructure Pilot Projects funded by C/CAG

mentioned below (Half Moon Bay Library/Cunha Middle School and Cabrillo Elementary School). The stewardship activities are focused on evaluating and improving sites in the following focus areas: litter/debris, vegetation, soils.

California Resilience Challenge Grant – Resilient San Carlos Schoolyards

During the 2020 grant cycle, C/CAG received one of 12 California Resilience Challenge grants in the state to develop resilient schoolyard concept plans for multiple sites in the San Carlos School District to show how GI can be integrated to build climate resilience while also improving water quality, increasing shading and greening on campuses, enhancing outdoor learning environments, and making curriculum connections with teachers and students. This builds on existing school-related efforts that C/CAG has been implementing, including partnership with the County Office of Education on its environmental literacy program and providing funding for integrated Safe Routes to School / Green Infrastructure projects further described below in the Street-Scale Stormwater Management section. In FY 2021/22, C/CAG and its partners completed the development of overarching goals and objectives for the resilient schoolyard project; site evaluation metrics and selection of three sites for concept development; school community engagement, including Stakeholder Advisory Committee meetings for each school, teacher training for student design workshops, curriculum integration training and site walk-throughs with each school Stakeholder Advisory Committee. The project team also completed schoolyard base maps collecting relevant topographical, drainage, building footprint and utility data, overlaid with design opportunities and priorities gleaned from stakeholder engagement and student design work.

Green Infrastructure Design Guide

As reported in prior years and described above, C/CAG created a new comprehensive GI Design Guide detailing how GI can be effectively incorporated into both parcel- and street-scale projects, including a library of typical design details. C/CAG continued to educate and inform member agencies of its availability and supported its access via the flowstobay.org website. In FY 2021/22, C/CAG developed a series of GI videos that link back to the core focus areas and scales for GI described in the GI Design Guide. The four-part video series includes an overall GI video and three focus videos showcasing GI in sustainable streets, schools, and residential applications. The videos are being finalized and will be posted on the SMCWPPP website (www.flowstobay.org) website when complete.

Street-Scale Stormwater Management

Green Streets via New/Redevelopment

Over the past few years, multiple Permittees in San Mateo County began requiring implementation of street-scale GI as part of new/redevelopment projects, effectively increasing the acreage of impervious area treated through private funds, and in many cases also including long-term operations and maintenance. It is important to note that these policies should also help address discharges of PCBs in adjacent public right-of-way areas during redevelopment in priority old industrial areas. C/CAG worked to promote this approach among its member agencies by highlighting these efforts at New Development Subcommittee meetings and C.3/GI trainings, and through development of model policy documents in the Sustainable Streets Master Plan. MRP 3.0 now explicitly requires that new and redevelopment projects provide LID treatment of impervious surface runoff in frontage areas when replacement or creation of impervious surfaces in those areas is part of the new or redevelopment scope of work. However, there may still be opportunities for jurisdictions to require GI in frontage areas beyond what is regulated as part of the redevelopment project.

Countywide Sustainable Streets Master Plan

C/CAG was awarded a nearly \$1M Caltrans Climate Adaptation Planning grant to develop the San Mateo Countywide Sustainable Streets Master Plan (SSMP) that prioritizes opportunities to integrate GI with planned transportation projects to help adapt the roadway network to a changing climate while simultaneously improving water quality. The SSMP prioritizes identified transportation needs (pulled from active transportation and Complete Streets plans, Safe Routes to School walk audits, Specific Plans, etc.) for GI integration using numerous technical suitability and co-benefit criteria. As part of the SSMP, C/CAG modeled future climate impacts on precipitation patterns, advancing the county's understanding of how storm intensity and frequency may change under future climate conditions. The SSMP includes 11 project concepts illustrative of different Sustainable Street typologies and geographically distributed throughout the county. Included in the appendices is a new Intersection Assessment Tool that allows municipalities to rapidly determine the feasibility of incorporating stormwater curb extensions at an intersection, as well as a complete library of typical design details for Sustainable Street projects. High-resolution drainage delineations were developed for the entire county, further advancing San Mateo Permittees' digital mapping of storm drain catchments down to the catch basin scale. The SSMP also includes model Sustainable Street policy language for Permittees to consider adopting, including model Sustainable Streets language for policy documents, a model Sustainable Streets resolution and policy to go beyond typical Complete Streets policies, a model resolution for GI development standards for new buildings, and model conditions of approval for development projects to require Sustainable Streets implementation as part of private development.

C/CAG staff presented on the SSMP project at the California Stormwater Quality Association (CASQA) Annual Conference in October 2021 as a CASQA 2021 Awardee in the category of Outstanding Sustainable Stormwater Project or Program. Staff also presented the SSMP as a forward looking stormwater infrastructure planning document that supports active transportation goals at the Silicon Valley Bicycle Coalition Bike Summit 2021 in August 2021 during the [rapid fire petcha kucha presentation](#). C/CAG continued sharing resources within the SSMP to its member agencies through workshops and Subcommittee meetings, especially regarding updates to the GI Tracking Tool, which was also developed as part of the SSMP, and continued sharing the resources online through the dedicated SSMP webpage – www.flowstobay.org/ssmp.

From the MRP perspective, the SSMP prioritizes integration of GI with planned transportation investments to achieve multiple benefits and make the most of limited agency resources, consistent with the strategies outlined above in Figure 3-1. For the 11 project concepts included in the plan, the total drainage management area that would be treated by the projects is just over 18 acres at a total cost of over \$27M (please note that these are integrated complete/green street projects, so costs include features not specific to stormwater treatment). While it is uncertain whether the 11 concepts will proceed to implementation, they are examples of projects that have existing local momentum and are now better situated for pursuing grant funding as a result of the concepts. C/CAG staff also continues to evaluate grant opportunities to help fund projects.

Safe Routes to School / Green Infrastructure Pilot Projects

In 2017, C/CAG awarded just over \$2M to 10 pilot projects throughout the County integrating Safe Routes to School and GI. These projects were funded with equal shares of Safe Routes to School and stormwater program funds, with funds from C/CAG covering up to 85% of construction costs. Nine of the ten projects have been constructed to date. C/CAG staff has been compiling information from each of the projects

detailing total costs, relative shares of Safe Routes to School and stormwater costs, and impervious area treated. These results are summarized in Table 3-1.

Table 3-1 shows that the average cost per acre treated is approximately \$300,000 when using just the estimated GI project costs (which are often difficult to clearly separate given the integrated nature of things like paving, concrete gutter work, etc.) or \$550,000 when using total project costs. The costs also vary, with the projects treating the largest areas generally tending to be more cost effective, which highlights the importance of incorporating GI into projects where it will have the most benefit in terms of area treated. While these costs are still preliminary as C/CAG and member agency staffs are finalizing results of the pilot program, they are illustrative of likely costs to treat an acre of impervious area within the public right of way.

Table 3-1. Pilot Integrated Safe Routes to School and Green Streets Infrastructure Project Costs (2017-2022).

Project Location	Description/Project Elements	Drainage Area (acres)	Green Infrastructure Project Costs	Safe Routes To School Project Costs	Non-participating/other costs	Total Cost	Cost/Acre Treated (GI Cost Only)	Total Project Cost/Acre Treated
Menlo Park	Two linear planters (both sides of street) w/underdrain, new crossing w/flashing beacons, new sidewalks/paths	1.46	\$291,541	\$240,800	\$44,213	\$576,554	\$199,685.62	\$394,900.00
Pacifica	Two curb extensions (both sides of the street) w/o underdrain, new crossing with island passage and flashing beacon	1.25	\$147,392	\$150,246		\$297,638	\$117,913.60	\$238,110.40
County	One "L" shaped planter behind curb w/o underdrain, one mid-block crossing (no stormwater), one crossing with new valley gutter and sidewalk	0.23	\$146,064	\$153,817	\$8,617	\$308,498	\$629,586.21	\$1,329,732.76
Millbrae	Five curb extension/bulbouts w/underdrain, three crossing improvements	1.95	\$349,663	\$157,190	\$396	\$507,249	\$179,314.36	\$260,127.69
Brisbane	Six curb extension/bulbouts w/underdrain, and an island crossing, eight crossing improvements	0.78	\$343,843	\$510,830		\$854,673	\$439,135.38	\$1,091,536.40
Colma	Two mid-block crossings with three curb extensions/bulbouts, w/underdrains and flashing beacons	1.47	\$185,770	\$121,922		\$307,692	\$126,374.15	\$209,314.29
Half Moon Bay	Three bulbouts with five bioretention areas w/o underdrains, new crossings, and additional midblock crossing w/o bioretention	0.48	\$303,554	\$202,369		\$505,923	\$632,403.75	\$1,054,005.83
Daly City	Two bulbouts with three bioretention areas w/underdrains, new crossings and ramps	1.40	\$118,523	\$61,057		\$179,580	\$84,659.29	\$128,271.43
Redwood City	Five bioretention areas w/ underdrains, new crossings and ramps w/ four bulbouts, high visibility crosswalks and two RRFBs	2.83	\$396,697	\$245,440		\$642,137	\$140,175.62	\$226,903.53
						Average	\$283,250	\$548,100

Non-Regulated Green Infrastructure Projects

C/CAG and its member agencies have been proactively building non-regulated GI projects since C/CAG provided its first pilot project funding to four projects in 2007. During the current permit term, municipalities have continued implementing voluntary GI projects consistent with the MRP requirement for “no missed opportunities,” primarily street-scale projects integrated with transportation improvements. C/CAG maintains a [GIS Story Map](#) detailing public GI projects (note: not all are non-regulated). C/CAG also supports its member agencies in tracking GI implementation for purposes of quantifying mercury and PCBs load reductions.

Tracking and Reporting Progress on Green Infrastructure

During FY 2021/22, SMCWPPP continued to make progress towards development and implementation of methods to track and report implementation of GI in San Mateo County and track associated pollutant load reductions. The ongoing effort to update the associated GI inventory is described in Section 11 (Mercury Controls) and Section 12 (PCBs Controls) of this report.

As mentioned above, C/CAG utilized funding through the San Mateo Countywide SSMP project to create an updated web-based San Mateo County GI Tracking Tool. The tool is available via the Countywide Program's website at www.flowstobay.org/ssmp. The tool allows for tracking all scales of GI implementation (regional, street, and parcel), and has been preliminarily populated with all GI implemented to-date in the County. Ongoing improvements to the tracking tool are underway, including several enhancements during FY 2021/22 focused on refining the data upload template, conducting QA/QC on data uploaded to date, improving the user functionality and interface of the tool, and expanding the ability to upload GIS shapefiles for drainage areas associated with any project for a more robust visualization of project performance. The tool has also been expanded to produce subwatershed-scale pollutant loading estimates for PCBs, mercury, and suspended sediments. C/CAG staff and consultants presented these updates to the SMCWPPP New Development Subcommittee at its May 10 meeting. The project team is currently developing a technical methodology to translate volumes of runoff managed by regional capture projects (and potentially other alternative compliance projects) to other priority MRP compliance metrics, including impervious acres managed ("greened acres") by GI retrofit projects.

Regional Collaboration

As in past years, throughout FY 2021/22 SMCWPPP participated in BASMAA's Development Committee (now the BAMSC Development Subcommittee). Through the BAMSC Development Subcommittee, SMCWPPP participated in regional projects that assist SMCWPPP and its San Mateo County municipalities in meeting specific requirements of Provision C.3, as described below.

Biotreatment Soil Media (BSM) Specifications

In FY 2021/22, SMCWPPP continued to support municipal staff, consultants and suppliers who have questions on the review and use of BSM. SMCWPPP staff screened and worked with vendors that are supplying the BSM product in the Bay Area and wish to be added to the vendor list that is posted on the SMCWPPP [website](#). The vendors must demonstrate an understanding of the 2016 BASMAA specification, submit lab results and a sample of their BSM product, and use consistent terminology on their websites advertising the product. See the [BAMSC](#) and [Flowstobay](#) websites for vendor lists and more information.

Biotreatment Soil Media Specifications and Bioretention Design with Trees

As a result of the Biotreatment Soil Roundtable held on June 30, 2016, a regional work group was formed to discuss designs that incorporate trees into bioretention areas. SMCWPPP staff took the lead on facilitating this BSM Tree-Design Work Group. In FY 2021/22, the BSM Tree-Design Work Group met on January 26, 2022, and continued to discuss and compile information on various design issues with trees in bioretention areas. The meeting summary is included in Appendix 3. Members of the work group include several city/county arborists, GI consultants, and municipal staff from parks departments and stormwater programs. DeepRoot GI staff provided design and maintenance information on their tree well filter systems using Silva Cells. In FY 2022/23, the Work Group will provide the forum for evaluating the benefit and associated runoff reduction criteria associated with trees with respect to treatment control

sizing, as encouraged by MRP Provision C.3.d.iv. Tree Runoff Reduction and Tree-Based Stormwater Treatment Systems. The Work Group will work with Water Board staff and other stakeholders to identify and quantify the multiple benefits of tree-based GI (e.g., urban forestry, suspended pavement systems), develop recommendations for Permittees to achieve the benefits, and suggest opportunities to modify Provision C.3 language in a future permit to better recognize broader benefits. This focus will begin in late FY 2022/23 and continue into FY 2023/24.

Participation in Processes to Promote Green Infrastructure

Provision C.3.j.iii. requires that Permittees individually or collectively, track processes, assemble and submit information, and provide informational materials and presentations as needed to assist relevant regional, State, and federal agencies to plan, design, and fund incorporation of GI measures into local infrastructure projects, including transportation projects. SMCWPPP is tracking and participating in BAMSC activities as well as conducting its own activities to assist Permittees comply with this provision.

C/CAG staff participated in the following efforts to promote GI:

- Presented on the Sustainable Streets Master Plan outcomes at the Silicon Valley Bicycle Coalition Annual Bike Summit on August 13, 2021: [“Tooling Up Sustainable Streets in San Mateo County”](#);
- Presented at the 2021 CASQA Annual Conference on October 27, 2021, as a CASQA Awardee (Outstanding Sustainable Stormwater Project or Program) for the “Calm Before the Storm: San Mateo County Sustainable Streets Master Plan”;
- Presented at the 2021 CASQA Annual Conference on October 27, 2021, as part of the panel “Advancing Collaborative Approaches to Regional Scale Stormwater Management” focusing on C/CAG’s Regional Collaborative Program Framework;
- Presented at the 2021 CASQA Annual Conference on October 27, 2021, as part of the panel “Co-Funding Stormwater Incentives through ‘Stacked Incentives’” in partnership with BAWSCA, the San Diego County Water Authority and County of San Diego;
- Presented to the CASQA Funding Subcommittee on February 1, 2022 on “Advancing Regional-Scale Stormwater Management in San Mateo County CASQA Funding Subcommittee”;
- C/CAG’s Executive Director presented to the California Municipal Finance Officers Meeting on February 16, 2022, on the topic of “Sustainable Stormwater Management in San Mateo County” focusing on multi-scale, multi-benefit green stormwater planning and implementation;
- Presented at the Bay Area Water Supply Conservation Agency’s Water Supply Reliability Roundtable on June 28, 2022, focusing on the “Advancing Regional Scale Stormwater Management in San Mateo County” project.
- Served as project manager for development of the Climate Resiliency Resources Guide for the GI Leadership Exchange. This Collaborative Grant Program project under the GI Leadership Exchange developed a comprehensive North American scale guide focused on creating resources for integrating climate adaptation into municipal GI programming and project implementation with detailed considerations and next step recommendations for advancing this work in the areas of policy, planning, design, and operations and maintenance.

The BAMSC FY 2021/22 Annual Report Regional Supplement for New Development and Redevelopment (Appendix 13) provides additional information on regional participation in processes to promote GI.

FUTURE ACTIONS

In FY 2022/23, SMCWPPP plans to continue working with the NDS to conduct the following activities to assist San Mateo County municipalities to comply with MRP Provision C.3:

- Continue to exchange information with San Mateo County municipalities on MRP implementation and other timely issues through quarterly NDS meetings and the C.3 workshops.
- Revise checklists and outreach flyers, as needed, and update the C.3 Regulated Projects Guide to respond to San Mateo County municipal staff issues, concerns, and suggestions for improvement and to prepare for implementation of MRP 3.0 beginning in July 2022.
- Support San Mateo County municipalities with guidance on GI Plan implementation.
- Conduct GI outreach and education with the public, municipal staff, and elected officials and further raising awareness about GI, including leveraging the newly developed GI video series, through the redesigned SMCWPPP website.
- Continue to coordinate with other related SMCWPPP subcommittees as needed (e.g., the Public Information and Participation Subcommittee to engage on GI outreach).
- Continue updating and improving the web-based Green Infrastructure Tracking Tool developed as part of the Sustainable Streets Master Plan, including training on use for Permittees, updating the database of projects and evaluating opportunities to expand the functionality of the tool to track and report information related to new asset management requirements under MRP 3.0.
- Continue to collaborate with BAMSC and Bay Area countywide stormwater programs on MRP 3.0 implementation, particularly GI implementation and guidance, updates to the BSM specifications and BSM suppliers list, and development of approaches for runoff reduction with trees through the BAMSC Development Subcommittee BSM-Tree Design Work Group.
- Collaborate with the BAMSC Development Subcommittee and Water Board staff and participate in the various new development-related work groups being established as required by MRP 3.0.
- Plan and conduct the C.3 workshop for municipal staff, building on the trainings conducted in previous years. Topics may include implementation of MRP 3.0 requirements such as GI implementation, regulated parcel-based and roadway projects, using SMCWPPP resources such as the GI Tracking Tool, and example reviews of development project plans.
- Continue advancing the Regional Project Planning and Collaborative Framework, including developing the initial phase of a proposed MOU-based program. New program elements and outputs may include development and legal review of an interim MOU-based Regional Collaborative Program, documents supporting initial pilot cost-sharing (e.g., a model MOU and/or interagency agreement, and O&M certification or other credit certification documents), and implementation of initial cost-sharing arrangements on a pilot project. Continue supporting, as needed, the Cities of San Bruno, Belmont, and Redwood City on advancing designs and environmental review for regional projects and seek new partnership and funding opportunities to advance the next five regional project concepts from preliminary design towards implementation.
- Complete the Resilient San Carlos Schoolyards Project via the California Resilience Challenge Grant, including development of a final Resilient San Carlos Schoolyards Report documenting the concept design process and final plans at the three selected schools and providing additional guidance with respect to curriculum integration, operations and maintenance and

funding/financing strategies. In parallel, as part of C/CAG's core outreach program, continue implementing pilot rain barrel installations at schools and community organizations including community-based workshops demonstrating how to install rainwater harvesting systems and providing details on C/CAG's and BAWSCA's rebate programs. Continue supporting the County Office of Education's Sustainable and Climate Ready Schools Initiative through community partnership.

- Continue supporting member agencies in pursuing funding for implementing projects identified in the Sustainable Streets Master Plan, including the 11 project concepts.
- Support completion of the last (of 10 total) integrated Safe Routes to School and Green Streets Infrastructure Project in East Palo Alto, funded by C/CAG's local vehicle registration.
- Continue administering the rainwater harvesting rebates and additional incentives for residential rain garden installations as part of the Lawn Be Gone! rebate program, in partnership with BAWSCA. The rain barrel rebate program will include a second pilot bulk-order campaign (targeting two to three events in different areas of the County) to provide greater incentives and broader participation in the program. Integrate GI outreach efforts to include a multi-part webinar series in partnership with BAWSCA focused on the rain garden and Lawn Be Gone! rebate program and lawn/rain garden integration replacement process.
- Plan to present at the annual CASQA conference in October 2022 on the FY 2021/22 pilot bulk order rain barrel rebate program as part of a panel presentation with the City of Palo Alto and on C/CAG's recent modeling efforts focused on developing methods to calculate "greened acres" as applied to regional scale stormwater capture projects via the GI Tracking Tool developments.
- Apply for funds under the GI Exchange Collaborative Grant 2022 program for Part 2 of the Climate Resilience Resources Guide focused on supporting decision making processes for GSI-resilience integration.

SECTION 4

C.4 INDUSTRIAL AND COMMERCIAL SITE CONTROLS

INTRODUCTION

A primary goal of SMCWPPP's Commercial, Industrial and Illicit Discharge (CII) component is to assist San Mateo County Permittees in controlling the discharge of pollutants in stormwater from commercial and industrial businesses to the maximum extent practicable. San Mateo County Permittees are responsible for complying with various commercial and industrial business facility inspection requirements under MRP Provision C.4. SMCWPPP's CII component assists San Mateo County Permittee staff with understanding these MRP requirements and develops various related tools, templates, reporting forms, and other MRP compliance support materials. The CII component also assists San Mateo County Permittees to comply with other MRP provisions that are discussed in other sections of this report (Sections 5, Illicit Discharge Detection and Elimination and Section 13, Copper Controls).

SMCWPPP's assistance with MRP Provision C.4 and other CII component provisions is coordinated through the CII Subcommittee.

IMPLEMENTATION OF MRP PROVISIONS

SMCWPPP performs a variety of tasks to assist San Mateo County Permittees with implementation of MRP Provision C.4, with input and assistance provided by the CII Subcommittee. FY 2021/22 accomplishments included the following:

- Held four CII Subcommittee meetings;
- Held an online Commercial/Industrial/Illicit Discharge Stormwater Inspector workshop;
- Developed a Parklet BMP Fact Sheet; and
- Updated the business stormwater inspector contact list on the SMCWPPP website.

More information about each of these accomplishments is provided below.

CII Subcommittee

The CII Subcommittee provides the opportunity for sharing information about MRP requirements related to commercial/industrial facility inspections and methods for achieving MRP compliance. The Subcommittee met four times during FY 2021/22 with good participation by municipal staff, as shown by the attendance list (Appendix 4). Ward Donnelly from the City of Daly City continued to chair the CII Subcommittee during FY 2021/22.

The meetings provided the opportunity for municipal staff to share their experiences with implementing MRP provisions related to the CII component, including Provision C.4. During FY 2021/22 meetings, there were discussions about records retention, use of body cameras for inspectors, stormwater inspection fees, illicit discharges, data management, and with the reissued MRP being adopted in May 2022, proposed changes to requirements in Provision C.4 Industrial and Commercial Site Controls based on the Tentative Order, revised Tentative Order, and subsequent adopted MRP 3.0.

Program Materials

In FY 2017/18 Countywide Program staff updated the SMCWPPP Stormwater Inspection Form Template and developed a Stormwater Inspection Tracking Excel Template for cities to track their stormwater inspection data, if needed.

In FY 2021/22, Countywide Program staff worked with the CII Subcommittee to develop a Parklet BMP Fact Sheet that presents BMPs to prevent wind or rain from carrying potential pollutants such as food particles, litter, wash water, and cleaning products from the parklet into the street, gutters, storm drain system, and then creeks and the Bay. Final formatting was conducted by SMCWPPP's public outreach consultant. The Parklet BMP Fact Sheet was added to the SMCWPPP website's Preventing Stormwater Pollution - Food Facilities webpage. Countywide Program staff also continued to make other outreach materials available on the SMCWPPP website (flowstobay.org).

CII Training Workshops

An online Commercial/Industrial Stormwater Inspector Training Workshop was held on June 29 and was attended by over 40 people. The workshop covered the basics of commercial and industrial facility stormwater inspections, changes in MRP 3.0, resources available to stormwater inspectors, a business inspection case study, and how inspector activities protect the health of San Mateo County creeks and the Bay. Appendix 4 includes a copy of the workshop agenda, attendance list, and evaluation form summary. Based on the evaluation forms submitted, attendees generally found that the workshop was useful and met their expectations. Recordings of this training will be made available on the members only section of the SMCWPPP webpage as a resource for training new inspectors and for providing refresher trainings for experienced inspectors.

FUTURE ACTIONS

FY 2022/23 activities planned by SMCWPPP to assist San Mateo County Permittees comply with requirements in Provision C.4 of the reissued municipal stormwater permit (MRP 3.0) include the following:

- Continue holding quarterly CII Subcommittee meetings;
- Continue to update existing or develop new business outreach materials as needed; and
- Assist San Mateo County Permittees with the implementation of commercial and industrial stormwater inspection tasks, including updating the Business Inspection Plans (BIP) template, Enforcement Response Plans (ERP) template, and inspection form and inspection tracking table, as needed.

SECTION 5

C.5 ILLICIT DISCHARGE DETECTION AND ELIMINATION

INTRODUCTION

A primary goal of SMCWPPP's Commercial, Industrial and Illicit Discharge (CII) component is to assist San Mateo County Permittees to effectively prohibit the discharge of illicit, non-stormwater discharges to the municipal storm drain system. San Mateo County Permittees are responsible for controlling non-stormwater discharges prohibited by MRP Provision C.5. SMCWPPP's CII component assists San Mateo County Permittee staff with understanding these MRP requirements and develops various related tools, templates, reporting forms, and other MRP compliance support materials. SMCWPPP's CII component also assists Permittees to comply with other MRP provisions that are discussed in other sections of this report (see Section 4, Industrial and Commercial Site Controls, and Section 13, Copper Controls).

SMCWPPP's CII component is coordinated through the CII Subcommittee. See Section 4 for further details about the CII Subcommittee.

IMPLEMENTATION OF MRP PROVISIONS

During FY 2021/22, SMCWPPP performed a number of tasks to assist San Mateo County Permittees with implementation of MRP Provision C.5, with input and assistance provided by the CII Subcommittee. Accomplishments included the following:

- Updated the table of stormwater enforcement actions against mobile businesses to share countywide with stormwater inspectors;
- Held an online Commercial/Industrial/Illicit Discharge Stormwater Inspector workshop (see Section 4 for details); and
- Updated the Illicit Discharge contact list on the SMCWPPP website.

More information on these accomplishments is provided below.

Countywide Program Materials

SMCWPPP has developed a variety of materials to assist municipal agency staff with implementing Provision C.5. These materials are all available on the SMCWPPP website (flowstobay.org) and continue to be useful tools that assist agency staff to achieve MRP compliance. The materials include an Illicit Discharge Investigation Field Form template, an Illicit Discharge Tracking Excel Template, and outreach materials.

Also available on the members only section of the SMCWPPP website is the countywide inventory of mobile businesses operating in San Mateo County. The mobile businesses identified in the inventory fall into the following categories: carpet cleaners, auto washers, steam cleaners, power washers, and pet care providers. The county inventory of mobile businesses is also periodically updated. Beginning in FY 2013/14, the CII Subcommittee surveyed San Mateo County agencies and compiled information on mobile businesses that were subject to stormwater enforcement actions during that fiscal year. This information was compiled in a table and made available on the members only section of the SMCWPPP website. The table is periodically updated with additional enforcement action information, including an update that was conducted during FY 2021/22.

In addition, BAMSC has a long-standing Surface Cleaner Training and Recognition program (developed by BASMAA¹) that focuses on improving the use of BMPs for businesses that clean surfaces (i.e., sidewalks, plazas, parking areas, and building exteriors). San Mateo County Permittees have continued to refer cleaners to BAMSC's website for surface cleaning training materials.

FUTURE ACTIONS

During FY 2022/23, SMCWPPP will assist San Mateo County Permittees comply with the requirements in MRP Provision C.5 by continuing to:

- Hold CII Subcommittee meetings;
- Assist with the implementation of illicit discharge detection and elimination tasks, including updating existing or developing new outreach materials as needed, and updating the Enforcement Response Plans (ERP) template, illicit discharge investigate form, and illicit discharge complaint and follow-up tracking template, as needed; and
- Assist Permittees comply with the requirements for controlling mobile sources in MRP Provision C.5.e., including providing updated information on mobile business BMPs as needed, sharing enforcement information, periodically updating the regional enforcement inventory, and conducting outreach activities.

¹ BASMAA was dissolved as a 501(c)(3) non-profit organization in FY 2021/22 but this program is continuing via the Bay Area Municipal Stormwater Collaborative (BAMSC).

SECTION 6

C.6 CONSTRUCTION SITE CONTROL

INTRODUCTION

This component of SMCWPPP assists San Mateo County municipalities in complying with MRP Provision C.6 (Construction Site Control). This assistance continued to be provided through the New Development Subcommittee (NDS, see Section 3 for more details). SMCWPPP staff also obtained input and direction from municipal agency representatives through the NDS when planning the trainings and other compliance assistance activities described below.

IMPLEMENTATION OF MRP PROVISIONS

SMCWPPP's accomplishments during FY 2021/22 include the following tasks to assist San Mateo County municipalities with implementation of MRP Provision C.6:

- Conducted a construction site controls and inspection training for the California Building Inspectors Group (CALBIG) on October 13, 2021;
- Conducted a construction site inspector training for municipal staff, and consultants representing municipalities, on March 30, 2022;
- Printed 2,000 copies of the Construction Site Inspection Form and distributed to Subcommittee members.

CALBIG Training Meeting

In FY 2021/22, SMCWPPP continued its partnership with CALBIG. Many building inspectors from San Mateo County municipalities participate in this organization. At the group's October 13, 2021 meeting in Redwood City, which was held in-person, SMCWPPP staff gave a presentation covering an overview of the MRP and Provisions C.3 and C.6, current stormwater requirements for construction sites, proper implementation of construction BMPs, MRP Provision C.13.a. (architectural copper), tips for keeping construction inspection programs in compliance, and the program to manage PCBs during building demolition. Approximately 20 people attended the training, including agency inspectors, local stormwater program staff, and contractors. The attendance list is provided in Appendix 6.

2022 Construction Site Inspector Workshop

The 2022 Construction Site Inspector Workshop was held on March 30, 2022. It was held virtually due to the COVID-19 pandemic. A total of 83 municipal and consultant staff attended the training. The workshop included presentations on MRP requirements, the municipal use of compost and mulch for stormwater and zero waste, construction site best management practices, and SB 1383 procurement requirements. In addition, the workshop included videos from the County of San Diego on erosion and sediment controls, how to protect storm drains, and how to install fiber rolls. A breakout session was

held for attendees to discuss how the COVID-19 pandemic has impacted stormwater inspections. The attendance record, agenda, and evaluation summary are included in Appendix 6. Video recordings of the presentations are available on SMCWPPP's website (flowstobay.org). Based on the evaluation forms submitted, attendees generally found that the workshop was beneficial and met their expectations.

Construction Site Inspection Form

In August 2021, SMCWPPP staff printed and distributed to San Mateo County municipalities 2,000 copies in triplicate form of the SMCWPPP Construction Site Inspection Report.

FUTURE ACTIONS

FY 2022/23 activities planned by SMCWPPP to assist San Mateo County Permittees comply with requirements in Provision C.6 of the reissued municipal stormwater permit (MRP 3.0) include the following:

- Continue to share information about construction site controls among San Mateo County municipalities through quarterly NDS meetings;
- Plan and conduct a Construction Site Inspector Workshop focusing on BMP inspections, Enforcement Response Plans and/or other topics of interest to the NDS; and
- Continue to coordinate with partner organizations, such as CALBIG, to provide additional training on construction-related stormwater issues.

SECTION 7

C.7 PUBLIC INFORMATION AND PARTICIPATION

INTRODUCTION

The primary goals of SMCWPPP's Public Information and Participation (PIP) component are to:

- Educate the public about the causes of stormwater pollution and its adverse effects on water quality in local creeks, lagoons, shorelines, and neighborhoods;
- Encourage residents to adopt less polluting and more environmentally beneficial practices; and
- Increase residents' participation and involvement in SMCWPPP activities.

PIP is essential for controlling and reducing the source of pollution since many preventable pollutants are associated with the everyday residential activity. Stormwater pollution may be reduced when residents are educated and motivated by the benefits of reducing pollutants. This approach of education and motivation is cost-effective and efficient in meeting the goal of reducing pollutants in stormwater to the maximum extent practicable.

Summary of Accomplishments in FY 2021/22

The SMCWPPP PIP Subcommittee oversees the development of outreach and educational materials and guides the implementation of the PIP component of the program. The Subcommittee met two times in FY 2021/22 with good participation by municipal staff, as shown by the attendance list, included in Appendix 7a.

SMCWPPP's PIP accomplishments during FY 2021/22 include the following:

- Partnered with the Bay Area Water Supply Conservation Agency (BAWSCA) to promote the countywide rain barrel program in association with a bulk rain barrel distribution pilot program. The supporting Rain Barrel outreach campaign received 324 rebate applications from residents (a 391% increase from FY 20/21) for a total of 541 rain barrel installations (415% increase from FY 20/21). Over 2,700 rain barrels have been installed to-date in San Mateo County under the rebate program.
- Partnered with the Bay Area Water Conservation Supply Agency (BAWSCA) to promote rain garden rebate as part of the Lawn Be Gone! Rebate. Launched a campaign to promote the rebate, which included a webinar. Results of the campaigns include one rain garden rebate, 1 rain garden webinar with 58 attendees, 1 rain garden in-person event with 5 attendees, and 27,042 total reach on social media posts.

- Partnered with and promoted the San Mateo County Office of Education’s “San Mateo Environmental Solutionary Teacher Fellowship.” This resulted in 2 teachers who completed the fellowship and reaching a total of 68 students, grades K to 12.
- Promoted Coastal Cleanup Day for 2,700 volunteers, raising awareness of the event and the consequences of littering behaviors resulting in 22,000 pounds of litter reported being picked up.
- Promoted efforts that San Mateo County Environmental Health Services (EHS) is involved in, which included: campaign to reduce littering of cigarette butts, update to the Reusable Bag Ordinance, and HHW Collection Program.
- Promoted Caltrans educational materials regarding uncovered loads in English and Spanish.
- Gained 292 new Facebook fans and a total post reach of 213,800 and 1,860 interactions with stormwater pollution prevention Facebook messaging.
- Sent 20 e-newsletters to a list of 4,065 active, opt-in subscribers with topics covering eco-friendly gardening practices, local cleanup events and stormwater pollution prevention information and tips. Gained 483 new email subscribers and had an average open rate of 49.6%.
- Received 90,606 visitors to the SMCWPPP website, which focuses on stormwater pollution prevention messaging and resources.
- Participated in 20 public outreach and citizen involvement events. In total, we had 860 attendees. These events, a mixture of virtual and in-person, provided educational content to residents and allowed residents to have their questions answered.
- Participated in a countywide stormwater-focused teacher fellowship program in coordination with the County Office of Education. In addition, we supported and facilitated the on-campus installation of 5 rain barrels and conducted 6 classroom lectures to teach students about watersheds and rainwater capture.
- Performed point-of-purchase outreach with Our Water Our World materials to 10 hardware stores in San Mateo County while engaging residents and employees with eco-friendly alternatives to pesticides.
- Promoted outreach messaging to residents and pest control operators regarding eco-friendly alternatives to pesticides in SMCWPPP’s newsletter, website, and social media channels.

IMPLEMENTATION OF MRP PROVISION C.7

C.7.b. Outreach Campaigns

Bulk Rain Barrel Pilot Outreach Program

The Bulk Rain Barrel Pilot Outreach Program in San Mateo County consisted of a mixture of digital engagement, in-person events, and multiple press features. The goal of this outreach program was twofold. The first goal aimed to address barriers for San Mateo County residents wanting to install rain barrels on their properties. These barriers, identified through multiple survey data, were the high cost of rain barrels and the lack of convenience for finding rain barrels in the County. The second goal of this program was to promote the San Mateo County rain barrel rebate program and increase participation.

Partnering with RainWater Solutions, C/CAG elected to implement and launch a bulk-order rain barrel pilot program in FY 2021/22 to test a new model of community engagement to further link stormwater

pollution prevention messaging with actionable outcomes. This bulk-order pilot program provided an opportunity to deliver high-quality, lower-cost rain barrels to the public in a convenient manner without creating the risk of an undersubscribed program by allowing the public to pre-order directly on a website. At the same time, the role of the program provided C/CAG the opportunity to advance stormwater pollution prevention messaging with a focus on the beneficial reuse of stormwater (turning rainwater into a resource) and to ramp up the countywide rain barrel rebate program. Combining the bulk discount rate with the rebate incentive gave residents in BAWSCA-participating member agency service areas to receive a rain barrel at zero net cost (Figure 7-1).



Figure 7-1. Image of San Mateo County residents lined up during a rain barrel distribution event.

Campaign Results & Evaluation

Given significant external factors that set the stage for launching the bulk-order program, including ongoing COVID-19 restrictions and a drought-stricken Bay Area, it was unclear how the program might perform or whether the message would resonate with the community. The goal was to distribute 330 barrels. Results of the pilot outreach program as of June 30, 2022 include:

- 1.09 million impressions to campaign promotional materials.
- 9,005 visits to the campaign landing page.
- Selling and distributing 726 barrels to 420 San Mateo County residents in 17 out of the County's 20 incorporated jurisdictions, as well as resident in unincorporated areas.
- 324 rain barrel rebate applications (a 391% increase from FY 2020/2021).
- 541 rebates administered and rain barrels installed (a 415% increase from FY 2020/2021).¹

¹A single application may be for up to two rebates; hence the number of rebates is larger than the number of applications.

To take a deeper dive into the program's success, and look to improve upon our efforts, we designed and distributed a survey to 395 program participants, which received a 30% response rate. As a direct result of the survey, C/CAG will work with BAWSCA, the rebate program administrator to help streamline the process for residents. Other key survey takeaways included:

- 72% of respondents were very satisfied with the rain barrel program.
- 96% of respondents stated water conservation as the main reason they purchased a rain barrel followed by wanting to reduce stormwater pollution (68%).

The full survey report can be seen in Appendix 7b.

The digital components of this program included a webpage on the SMCWPPP public education website, flowstobay.org. This page provided details of both the rebate program and bulk rain barrel, including a form to quickly understand how much of rebate residents are eligible for, a step-by-step video on rain barrel installation, details on ordering and picking up the rain barrel, and a list of rain barrel installers should they require additional assistance. If residents were still interested in participating in the program, they were sent to an [e-commerce site](#) set up by RainWater Solution to securely purchase a barrel online.

To promote the pilot and rebate program, C/CAG sent out e-newsletters to its 4k+ subscriber database, utilized its Instagram and Facebook platforms with 26K+ followers, used paid advertising, and asked that partnering agencies help spread the word on their own communications channels. Here are results from these efforts.

Platform	Impressions	Clicks/Engagement
Campaign landing page	9,005	1,224
Google Ads	824,374	5,606
Facebook	246,900	7,801
Instagram	9,284	654
e-Newsletter	4,040	672

The activity of the outreach program resulted in various media inquiries and content production. Press releases were sent to media outlets during different stages of the program and invited them to attend our distribution event. Throughout the life of the program, these efforts attracted various media outlets, as reported below.

News Outlet	Date	Article Title	Article Link
Telemundo 48	4/29/22	"Hasta \$200: ahorra agua con los barriles de lluvia y gana dinero en el condado San Mateo"	Link
KTVU Fox 2	2/11/22	"Bay Area residents dip into harvested rainwater during dry spell"	Link
SF Chronicle	1/29/22	"Discount rain barrels promise big water savings — if we get more storms"	Link
San Mateo Daily Journal	1/28/22	"Rain barrels becoming more popular in San Mateo County"	Link
San Francisco Examiner	11/11/21	"It's time to value stormwater as a resource"	Link
Patch of Redwood City	9/30/21	"San Mateo Co. Promotes Rain Barrel Program Ahead Of Rainy Season"	Link

Additional assets and components can be viewed in Appendix 7c.

Rain Garden Outreach Program

In FY 2021/22, SMCWPPP continued outreach efforts to promote the [Rain Garden rebate](#) as part of the BAWSCA Lawn Be Gone! (LBG) lawn conversion rebate program. The rebate provided a flat rate amount of \$300 to residents in the participating BAWSCA member agency jurisdictions. Our efforts throughout the fiscal year included:

- Hosting a free online 2-hour virtual workshop about rain gardens;
- Hosting a hands-on rain garden installation workshop (Figure 7-2);
- Launching a digital geo-targeted advertising campaign;
- Creating online [video resources](#);
- Posting rain garden-related posts on social media; and
- Partnering with PIP members who are also BAWSCA rain barrel rebate participating agencies to help promote the new rain garden rebate.

Residents were directed to the rain garden webpage on flowstobay.org which helped explain what rain gardens are and their benefits, interactive “before” and “after” photos to demonstrate how the rebate can be implemented into residents’ yards, information about the Lawn Be Gone! (LBG) Rebate with rain garden addition, and additional resources. The web page can be viewed here: www.flowstobay.org/rain-gardens. See Appendix 7d for additional outreach messaging on digital and social media platforms.

Campaign Results & Evaluation

The results of the campaign included:

- 1 rain garden rebate submitted.
- 161 registrants and 58 total virtual workshop attendees. Of the attendees, 39 completed post-event survey:
 - 90% rated themselves very satisfied with the program.
 - 44% responded that they would definitely be replacing their lawn or installing a rain garden within 12 months’ time.
- 15 registrants and 5 total in-person workshop attendees.
- 4,579 pageviews on the campaign landing page.
- 76 downloads of the rain garden paper applications.
- 27,958 impressions from campaign promotional materials.



Figure 7-2. Before and after photo of the rain garden installed as part of the hands-on workshop.

Green Streets Stewards Pilot Program Continuation

The goal of Green Streets Stewards (GSS) Program was to pilot a foundational program to support current and ongoing green stormwater infrastructure (GSI) facility maintenance needs across different jurisdictions while also engaging and educating residents, students, and community groups on the function and value of GSI. The pilot, a continuation from FY 2020/21, aimed to educate residents and community groups on the function and value of GSI, and to promote sustainable stormwater management by empowering residents and community groups to perform basic maintenance on their local GSI in cooperation with the local municipal government agencies. SMCWPPP partnered with the UC Master Gardeners, City of Half Moon Bay, and the City of Pacifica in FY 2021/22.

Campaign Evaluation

FY 2021/22 marked the second year of the Green Streets Stewards Pilot Program and met the following project objectives:

- Created a training curriculum and a community science protocol.
- Set up digital data collection using the ESRI Survey123 app.
- Recorded data such as vegetation condition, debris/sedimentation, soil compaction and soil infiltration.
- Tended and cared for the GI facilities in Half Moon Bay and Pacifica (Figure 7-3).
- Engaged with the community to discuss GSI, its benefits, and its stewardship during five in-person outreach events.



Figure 7-3. A GSS event in Half Moon Bay.

C.7.c. Stormwater Pollution Prevention Education

SMCWPPP continued to use social media, the flowstobay.org website, and the electronic newsletter to promote stormwater pollution prevention messages.

Social Media

SMCWPPP continued to maintain the social media platforms of Facebook and Instagram. These platforms were used as a tool for two-way communication and has continued to be an effective method to engage with residents. With an already established Facebook presence consisting of over 26K followers, we focused our efforts on increasing engagement and followership on Instagram.

By the end of the fiscal year, we gained 470 new followers on this new platform bringing the total followers to 1,019. We also managed to gain 347 new Facebook page likes for a reaching a total of 26,921 page likes between July 1, 2021 and June 30, 2022.

Facebook and Instagram were used to publicize stormwater issues, watershed characteristics, and stormwater pollution prevention alternatives. The platforms were primarily used to inform the public of online environmental outreach events, to promote a shift towards incorporating sustainable behaviors into daily lifestyles, and to provide environmental and marine news relevant to San Mateo County pollution prevention. The accounts were monitored on a daily basis throughout the fiscal year. As part of the overall effort to enhance social presence and engagement with followers, we wrote blogs, posted about “community champions” (i.e., residents of San Mateo County who had gone above and beyond to

be environmental stewards in their communities), and we responded to residents' questions—often directing them to resources on our website.

The following is a breakdown of tasks and evaluation metrics associated with social media activity for FY 2021/22:

- Continued utilizing Facebook (Figure 7-4) as a two-way communication tool to share and exchange information between SMCWPPP residents, businesses, nonprofits, and community stakeholders within San Mateo County on pollution prevention messages. Specific program messages included watershed protection, water pollution and Bay area marine news, wash water pollution prevention, the benefits of GSI, household hazardous waste, and used motor oil & filter recycling content.
- Continued to utilize Facebook and Instagram (Figure 7-5) as the SMCWPPP website's advertising platform to further promote messages.
- Facebook metrics:
 - Gained 347 Facebook page likes (for followers gained minus followers lost), reaching a total of 26,921 page likes.
 - Garnered 256,567 total page impressions (number of people that viewed our page).
 - Reached a total of 190,124 people (number of people who had content from our page enter their screen).
 - Garnered 1,860 interactions (likes, comments, and shares).
 - Published a total of 183 Facebook posts.
- Instagram metrics:
 - Gained 470 followers.
 - Garnered 49,123 total page impressions (number of people that viewed our page).
 - Garnered 4,374 interactions (likes, comments, and shares).
 - Received 194 saves on posts.
 - Received 36 website clicks from posts.
 - Published a total of 192 Instagram account posts.
 - Published a total of 222 Instagram story posts.

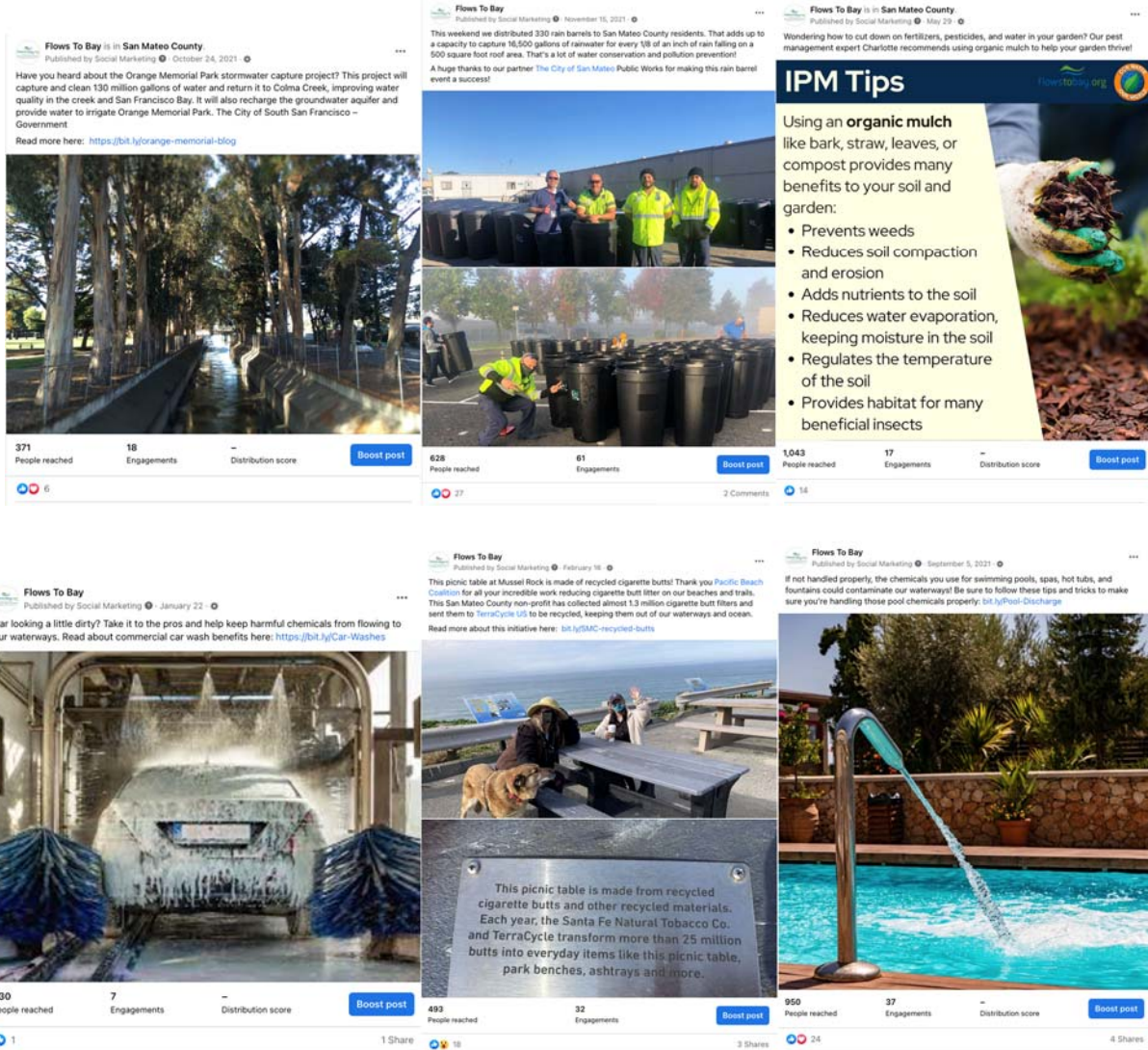
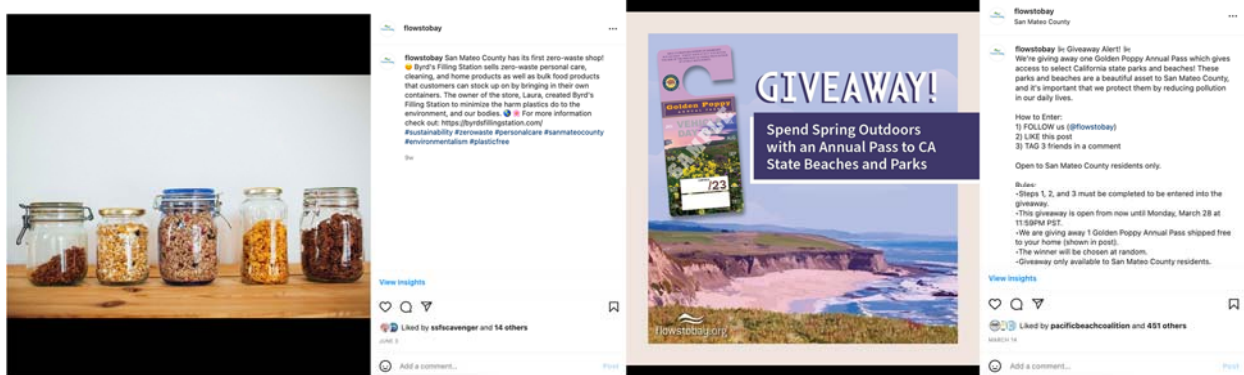


Figure 7-4. Examples of FY 2021/22 Facebook Posts.



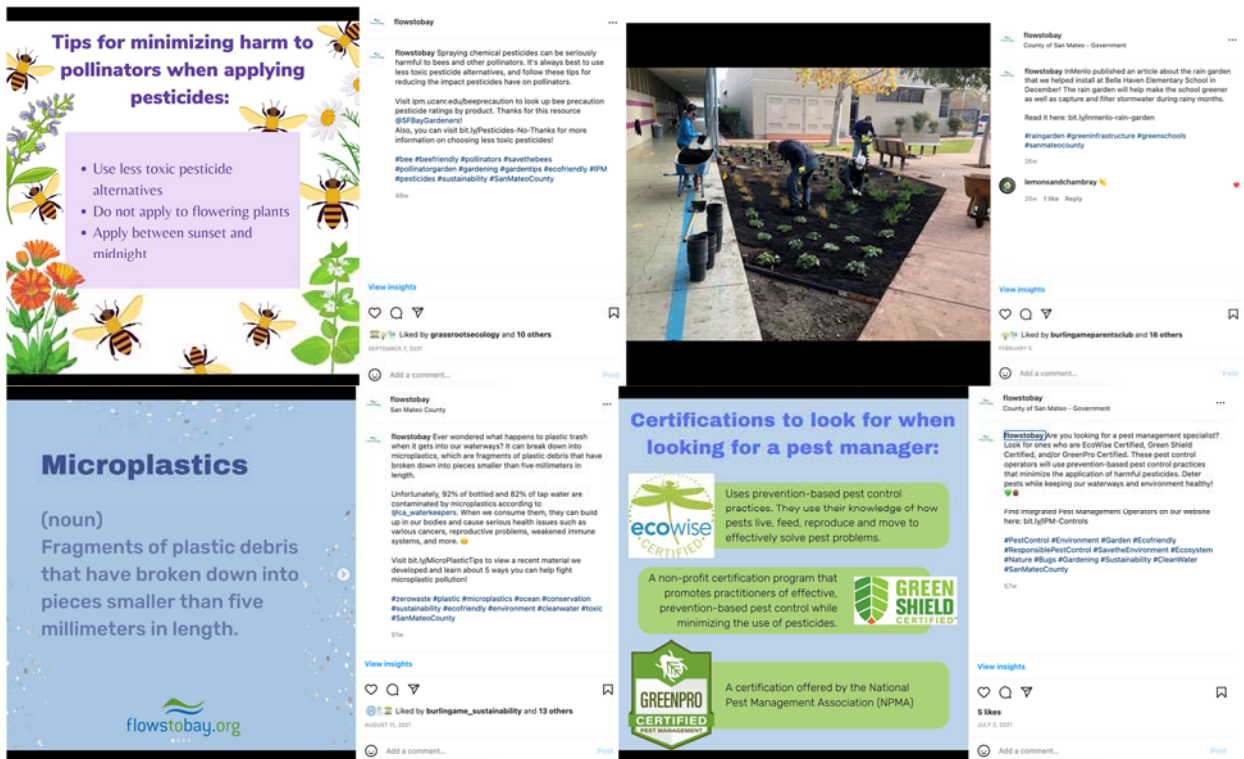


Figure 7-5. Examples of FY 2021/22 Instagram Posts.

In addition to the standard Facebook social media activity, Facebook Ads Campaigns (Figure 7-6) consistently ran from July 1, 2021 – June 30, 2022. These aimed to reach to potential community members through the use of audience location and interest targeting.

Facebook Ads in FY 2021/22 resulted in a total of:

- Received 728 likes to our page
- 191 total post shares
- 24,501 total link clicks
- 159,834 total reach
- 827,388 total impressions

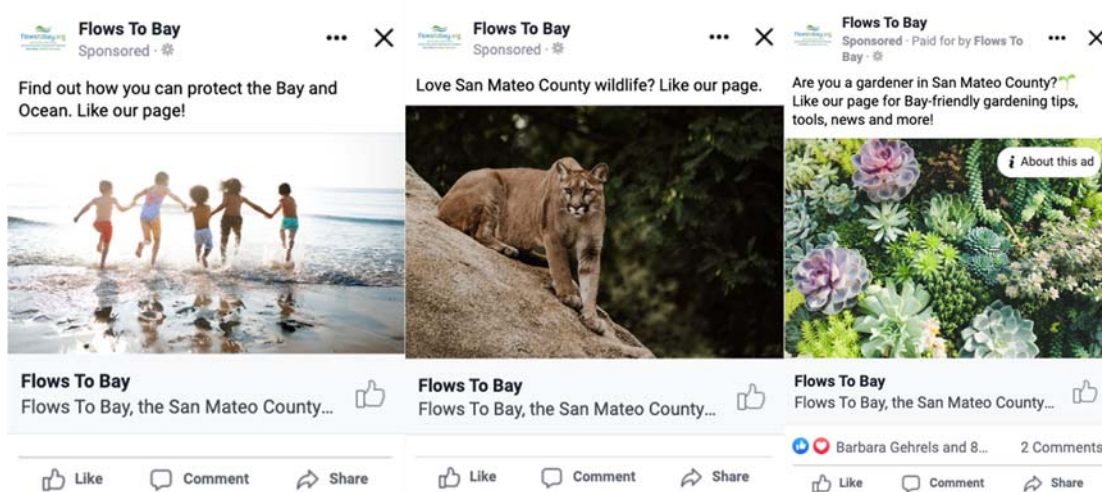



Figure 7-6. Examples of FY 2021/22 Facebook Advertisements.

Newsletter

The SMCWPPP newsletter was utilized to publicize stormwater issues, watershed information, upcoming webinars, and stormwater pollution prevention options to residents. A total of 21 e-newsletters were sent out to our community newsletter subscriber list. SMCWPPP’s subscriber list reached a total of 4,067 subscribers in FY 2021/22—adding a total of 483 new subscribers, a 7% increase from the previous fiscal year. We also achieved an average open rate of 49.6% and average click rate of 7.4%, which are higher than the government industry averages of 28.8% and 4.0%, respectively.

Table 7-1. SMCWPPP E-Newsletter Metrics for FY 2021/22

Subject Line	E-Newsletter Content	Send Date	Total Recipients	Open Rate	Click Rate	Clicks Per Unique opens
San Mateo County Drought News	-What is drought? -SMC drought response -Tips for addressing drought	8/11/2021	1,716	48.5%	6.30%	12.9%
Coastal Cleanup Day 2021	Coastal cleanup day	9/1/2021	1,833	40.9%	5.7%	13.9%
🌧️ Announcing Our Discounted Rain Barrel Pilot Program	Rain barrel pilot program announcement	9/10/2021	1,826	43.4%	9.7%	22.3%
Fall Tips for a Pest-Free Garden	October IPM webinar announcement	9/28/2021	1,832	37.6%	4.00%	10.6%
Action and Education As We Change Seasons	-First Flush -October IPM webinar	10/2/21	1,826	39.0%	1.6%	4.1%
Upcoming Rain Garden Webinar	Rain garden webinar	10/12/2021	1,824	44.6%	4.4%	9.9%

Subject Line	E-Newsletter Content	Send Date	Total Recipients	Open Rate	Click Rate	Clicks Per Unique opens
 In Case You Missed It: News You Can Use from Flows To Bay	-Orange Memorial Park blog -Surfrider blog -Neil Panton blog	10/29/2021	1,883	43.8%	6.30%	14.4%
Rainy Season Giveaway!	Rain barrel giveaway	11/16/2021	400	43.1%	14.0%	32.6%
Catch up on the latest news from Flows To Bay	-King Tides blog -Rain barrel blog -Rain gardens blog	12/2/2021	1,902	49.6%	5.9%	11.8%
Share your rain barrel story!	Encouraging rain barrel recipients to share their story	12/9/21	185	62.2%	11.90%	19.1%
Exciting volunteer opportunity!	Belle Haven rain garden volunteer opportunity	12/9/21	183	45.6%	1.1%	2.4%
Rain barrels are back!	Rain barrel pilot program announcement	12/28/21	1,899	65.7%	9.2%	14.0%
Webinar: Eco-friendly Weed Management	Spring Weed Management Webinar	2/26/2022	1,948	55.5%	4.1%	7.4%
In Case You Missed It: Webinar and Blogs	-Spring webinar -Plastic Free Future blog -Rain barrels blog -Weed management blog	3/8/2022	1,941	53.3%	4.4%	8.3%
Spring Giveaway	Park Pass Giveaway	3/15/2022	4,126	39.1%	4.5%	11.5%
Rain barrel program survey and raffle prize!	Rain barrel pilot survey	3/16/2022	395	62.5%	31.9%	51.0%
Rain Barrel Survey Reminder	Rain barrel pilot survey	3/22/2022	395	56.7%	19.0%	33.5%
Upcoming Rain Barrel Installation Workshops	Rain barrel installation workshops	4/8/2022	2,342	57.80%	1.9%	3.3%
Spring Into Action!	-Spring cleaning tips -Rain barrel installation workshop -In-Person pest advice -Storm drain mural pilot	4/21/2022	2,338	57.6%	2.4%	4.2%

Subject Line	E-Newsletter Content	Send Date	Total Recipients	Open Rate	Click Rate	Clicks Per Unique opens
Park Pass Giveaway!	-Park pass giveaway	6/14/2022	4,097	41.30 %	4.7%	11.4%
Summer News and Resources	-Keeping waterways clean for summer -Drought blog -Orange Memorial Park	6/28/2022	2,543	54.1%	2.6%	4.9%

** Industry average open rate is 28.8% and average click rate on articles is 4.0% (source from Oct 2019, Mailchimp)*

SMCWPPP Website

This fiscal year, we linked or referenced content on our website through our various communication mediums, such as Facebook, Instagram, e-Newsletter, blogs, during webinars and workshops for resources. We kept our [online community events calendar](#) active. See Appendix 7e for blog and analytics data (Figure 7-7).

During FY 2021/22, the flowstobay.org website had the following results:

- 66,839 sessions (95% increase from FY 20/21)
- 53,390 new users (108% increase from FY 20/21)
- 90,606 page views (63% increase from FY 20/21)
- 8,722 resource downloads (4% increase from FY 20/21)
- 4,475 outbound links (103% increase from FY 20/21)

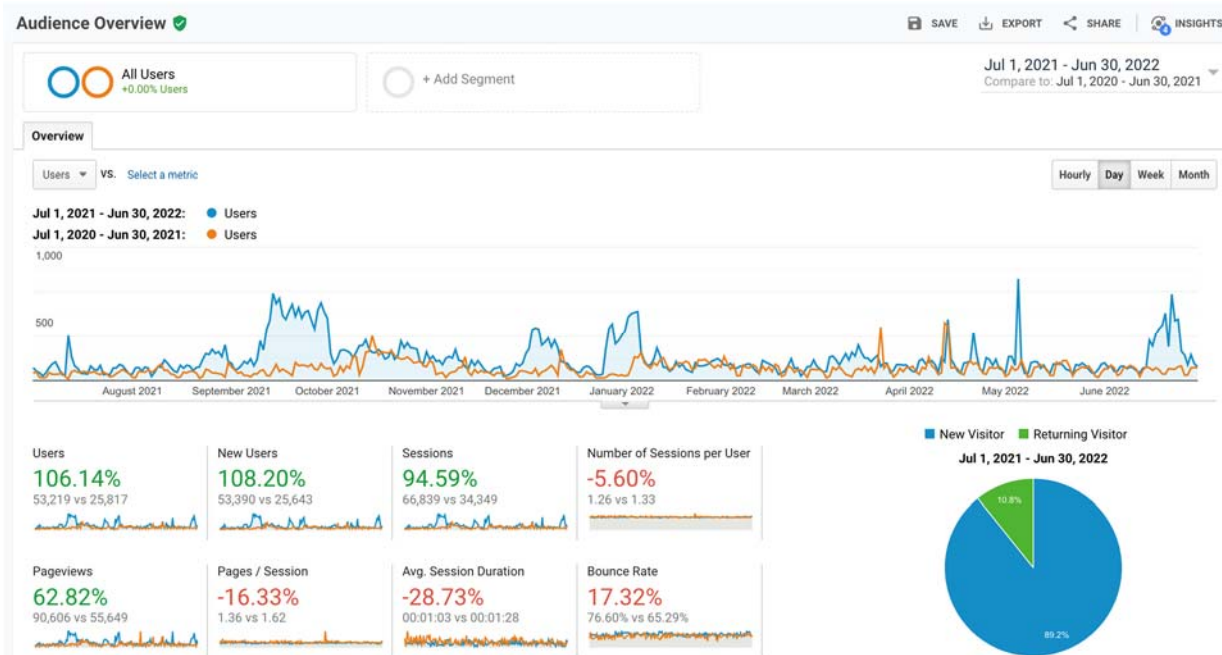


Figure 7-7. Google Analytics metrics for FY 2021/22.

C.7.d. Public Outreach and Citizen Involvement Events

Overview

SMCWPPP directly participated in 20 public outreach and citizen involvement events in FY 2021/22 in order to reach a wide array of residents in different parts of the County (Figure 7-8). SMCWPPP used online channels, such as Facebook, Instagram, and the SMCWPPP website to promote events and gather volunteers. In total, events reached 52,816 residents with 860 event attendance.

Event Goals

- Educate residents through personal interaction and educational materials.
- Build our existing database of residents interested in stormwater issues.
- Provide a platform for residents to engage with SMCWPPP messages.
- Develop outreach partnerships with County agencies, NGOs, and CBOs.
- Promote local cleanup events, such as Coastal Cleanup Day.

Outreach Materials

The following SMCWPPP items are given out by request provided to Permittees, organizations, and residents in San Mateo County (not including the less-toxic pest control items listed in section C.9.h.ii).

- “You Are the Solution To Water Pollution” pamphlet (English and Spanish)
- Stormwater tip card (English, Mandarin, and Spanish)
- Rain barrel tip card
- Pet waste tip card (English, Mandarin, and Spanish)

- Microplastics tip card (English, Mandarin, and Spanish)
- Litter tip card (English, Mandarin, and Spanish)
- BAWSCA rain barrel rebate packet
- BAWSCA Lawn Be Gone! & Rain Garden Rebate packet
- “Keep Car Wash Pollution out of the Storm Drain” pamphlet
- “Tarp Your Load” flier (English front, Spanish back)
- Two children’s activity books: “Pest or Pal” (OWOW – Our Water, Our World) and “Discover Storm Water”
- Green Stormwater Infrastructure Fact Sheet
- Dog waste bag canister
- Branded metal straw with rubber tip and cleaner
- Recycled water bottle pens
- Branded reusable bags
- Sea animal stickers
- Fish erasers

Table 7-2. FY 2021-22 Public Outreach and Citizen Involvement Events and Metrics

Dates	Event Location	Event Name	Type of Event	Est. Event Attendance	Estimated Reach
9/25/21	San Mateo	IPM Tabling Event: The Home Depot San Mateo	Citizen Involvement + Public Outreach	30	2,691
10/02/21	Colma	IPM Tabling Event: The Home Depot Colma	Citizen Involvement + Public Outreach	21	2,917
10/06/21	Online	Fall Tips for a Pest-Free Garden	Public Outreach	65	563
10/23/21	Online	Rain Gardens 101: How to Design, Build, and Maintain a Rain Garden	Public Outreach	58	5,199
10/29/21	Half Moon Bay	Green Street Stewardship Event	Citizen Involvement + Public Outreach	5	35
11/06/21	East Palo Alto	IPM Tabling Event: The Home Depot East Palo Alto	Citizen Involvement + Public Outreach	14	2,311
11/13/21	San Mateo	Rain Barrel Distribution Event	Citizen Involvement + Public Outreach	184	1,518
12/19/21	Menlo Park	Belle Haven Elementary School Rain Garden Installation	Citizen Involvement + Public Outreach	5	21,516
01/08/22	Redwood City	Redwood High School Rain Barrel Installation Workshop	Citizen Involvement + Public Outreach	21	4,885

Dates	Event Location	Event Name	Type of Event	Est. Event Attendance	Estimated Reach
01/29/22	San Carlos	Rain Barrel Distribution Event	Citizen Involvement + Public Outreach	229	312
2/11/22	Half Moon Bay	Green Street Stewardship Event	Citizen Involvement + Public Outreach	4	27
03/12/22	Online	Spring Blooming: Eco-Friendly Weed Management Webinar	Public Outreach	88	972
03/26/22	San Mateo	IPM Tabling Event: The Home Depot San Mateo	Citizen Involvement + Public Outreach	28	1,598
04/15/22	Pacifica	Green Street Stewardship Event	Citizen Involvement + Public Outreach	5	0
04/16/22	San Mateo	Rain Barrel Hands-On Installation Workshop at Laurel Elementary School	Citizen Involvement + Public Outreach	13	153
04/23/22	Redwood City	IPM Tabling Event: Hassett Ace Hardware Redwood City	Citizen Involvement + Public Outreach	32	1,195
04/30/22	Menlo Park	Rain Barrel Hands-On Installation Workshop at Belle Haven School	Citizen Involvement + Public Outreach	20	2,660
05/13/22	Half Moon Bay	Green Street Stewardship Event	Citizen Involvement + Public Outreach	10	466
05/21/22	Colma	IPM Tabling Event: The Home Depot Colma	Citizen Involvement + Public Outreach	30	3,707
06/10/22	Half Moon Bay	Green Street Stewardship Event	Citizen Involvement + Public Outreach	10	391



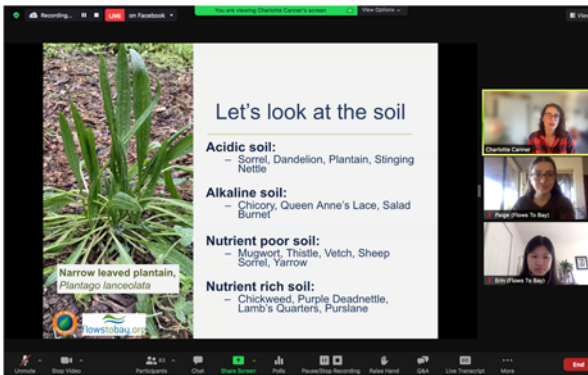
(a)



(b)



(c)



(d)



(e)



(f)



(g)

Figure 7-8. Variety of images from outreach events throughout the fiscal year including (a) rain barrel hands-on workshop at Laurel Elementary; (b) Half Moon Bay High School with students and community members; (c) a Green Street Steward event; (d) an online IPM webinar; (e) IPM tabling event; and the rain barrel distribution event in (f) San Mateo and (g) San Carlos.

C.7.e. Watershed Stewardship Collaborative Efforts

Rain Barrel Rebate Program

During FY 2021/22 SMCWPPP continued its partnership with the Bay Area Water Supply and Conservation Agency (BAWSCA) to promote the countywide rain barrel and lawn replacement/rain garden rebate programs and inspire San Mateo County residents to join the rainwater harvesting movement and to help promote other water conservation events. The program subsidizes the cost of purchasing a rain barrel by providing rebates up to \$200. In FY 2021/22 there were a total of 541 rain barrel rebates issued from 324 rain barrel applications. BAWSCA reported that this fiscal year marked the second highest number of rebates received and approved since the program inception. This increase was directly impacted by the bulk rain barrel pilot outreach program discussed in section C.7.b. To-date, over 2,600 rain barrels have been installed to-date in San Mateo County under the rebate program. See Section C.7.b for additional details.

C.7.f. School-Age Children Outreach

San Carlos Schoolyards Project

During the 2020 grant cycle, C/CAG received one of 12 California Resilience Challenge grants in the state to develop resilient schoolyard concept plans for multiple sites in the San Carlos School District to show how GI can be integrated to build climate resilience while also improving water quality, increasing shading and greening on campuses, enhancing outdoor learning environments, and making curriculum connections with teachers and students. This builds on existing school-related efforts that C/CAG has been implementing, including partnership with the County Office of Education on its environmental literacy program and providing funding for integrated Safe Routes to School / Green Infrastructure projects further described in Section C.3. In FY 2021/22, C/CAG and its partners completed the development of overarching goals and objectives for the resilient schoolyard project, site evaluation metrics and selection of three sites for concept development, and school community engagement including Stakeholder Advisory Committee meetings for each school, teacher training for student design workshops, and curriculum integration training and site walk-throughs with each school Stakeholder Advisory Committee. The project team also completed schoolyard base maps collecting relevant topographical, drainage, building footprint and utility data, overlaid with design opportunities and priorities gleaned from stakeholder engagement and student design work. To learn more about this project visit flowstobay.org/scsd.

Greening School Yards Program

Greening Schoolyards in San Mateo County is part of the larger SMCWPPP public outreach and education program. It allows us to share our message about watershed protection, pollution prevention, and GSI with schools and the communities around them.

Through Greening Schoolyards, SMCWPPP partners with professionals install certain GSI projects on school campuses, including rain barrels, cisterns, and/or rain gardens. The goals of this project are to:

- Conduct hands-on community-based events that engaged schools, their students, and surrounding communities while educating and demonstrating how they may install similar projects on their property.
- Provide climate resilience benefits of GSI to school campuses which may include flood mitigation, reducing urban heat island effects, and increasing natural habitat for pollinators and birds.

- Create an outdoor educational resource that may be used in classroom curricula to discuss the water cycle, environment, watersheds, and effects of climate change.

Table 7-3. Greening Schoolyards Program Reach

School	Grades Level	Approx. # of students reached	Details
Belle Haven Elementary	K-5	90	Rain garden and 305-gallon cistern community installation
Redwood High School	9-12	80	660-gallon cistern community installation
Westborough Middle School	6-8	100	660-gallon cistern community installation
Laurel Elementary	PK - 8	60	205-gallon cistern teacher-led installation
Half Moon Bay High School	9-12	60	220-gallon cistern student-led installation

In FY 2021/22 the program installed five cisterns and one rain garden on school campuses. These installations were a part of community workshops that allowed students and community members to participate in the hands-on installation of the GSI projects. In addition to the workshops, the rain barrel specialist conduct in-class lectures to discuss rainwater capture capture, stormwater pollution prevention, and the benefits of rain barrels.

Please see Appendix 7f for additional information on the campus installation projects.

County Office of Education Environmental Solutionary Teacher Fellowship Program

In FY 2021/22, SMCWPPP was a supporting partner with the [San Mateo County Office of Education](#) to implement a comprehensive, standards-aligned learning units that focused on the environmental, social, and economic impacts of stormwater pollution and watershed management. Flows To Bay served in the role of community-based partner, assisting with stormwater content and being available as a resource for teachers, and conducting in-class presentations as requested.

In total, two teachers from San Mateo County completed the fellowship with a total reach of 68 students. We also conducted two in-person classroom presentations, both on March 15 at Connect Community Charter School in Redwood City and to split classes of 2nd/3rd-grade students with about 20 students each (~40 students total). The presentation was age-appropriate and had a theme of “How To Be A Watershed Hero” to educate students about stormwater pollution and how to prevent it (Figure 7-9). The slides discussed various terms and topics related to stormwater pollution, featured a mascot named “Ollie the Otter,” included explanatory images and videos, gave clear action steps students can take regarding the topic, and had a Q&A portion at the end to attend to any remaining questions and clear up any points of information.



Figure 7-9. Screenshots of the student presentation.

Campaign Evaluation

- All teachers and administrative staff reported being satisfied with the Greening Schoolyard programs, with one of the schools requesting additional installation of another rain barrel in the future.
- The classroom presentations were created to boast student engagement through its content and direct questions to ensure students’ retention of the educational content. To encourage participation and keep their attention, students were given their choice of a pollution prevention-related “prize” with SMCWPPP’s logo (recycled water bottle pens, waste bag canister, fish erasers, sea animal stickers, metal straw with silicon mouth tip, and reusable tote bag) for answering questions during the presentation. All students and teachers were given at least one prize (cap of 2) and all received the “You Are the Solution to Stormwater Pollution” brochures to take home.
- Survey results showed that for those who completed the fellowship program, it was highly successful with 85% reporting the program was very high to extreme satisfaction with the Summer Institutes.

FUTURE ACTIONS

FY 2022/23 activities planned by SMCWPPP to assist San Mateo County Permittees comply with requirements in Provision C.7 of the reissued municipal stormwater permit (MRP 3.0) include the following:

- Grow the reach, engagement, and following of SMCWPPP’s Facebook and Instagram accounts with posts and advertisements;

- Promote county outreach events through the website and social media;
- Launch a litter and illegal dumping outreach campaign to bring awareness to the issue and encourage litter prevention and participation in litter cleanup behavior;
- Continue the bulk rain barrel program to distribute low-cost, high-quality rain barrels to residents while promoting the rain barrel rebate;
- Continue facilitating online and in-person outreach events;
- Host and facilitate in-person tabling events at hardware stores across the county to support IPM message;
- Maintain and update SMCWPPP's www.flowstobay.org website to revise and update the content;
- Continue outreach and promotion of stormwater messaging through the e-newsletter, one of the top performing platforms;
- Grow e-newsletter subscribership numbers through cross-promotion on the website, social media platforms, giveaways, contests, and paid advertising media;
- Support and promote the rain barrel rebate and rain garden rebate programs in partnership with BAWSCA, with C/CAG providing ongoing funding;
- Create a comprehensive program that shares eco-friendly and stormwater pollution prevention practices, rebates, and educational workshops with residents;
- Additional greening project planning and implementation at priority schools, in partnership with community organization, Each Green Corner, to support GSI efforts, school-age education, and outreach; and
- Ongoing support of Resilient San Carlos Schoolyards project and supporting COE's Sustainable and Climate Ready Schools Initiative.

SECTION 8

C.8 WATER QUALITY MONITORING

On behalf of its member agencies, SMCWPPP performs water quality monitoring activities in compliance with MRP Provision C.8. Per Provision C.8, a complete documentation of all water quality monitoring data collected from October 1, 2021 through September 30, 2022 (i.e., Water Year 2022 or WY 2022) will be presented in SMCWPPP's Urban Creeks Monitoring Report, which will be submitted to the Regional Water Board by March 31, 2023.

SECTION 9

C.9 PESTICIDE TOXICITY CONTROLS

INTRODUCTION

The primary objective of MRP Provision C.9 Pesticides Toxicity Control is to prevent the impairment of urban streams by pesticide-related toxicity. Provision C.9 therefore helps implement the *TMDL for Diazinon and Pesticide-related Toxicity for Urban Creeks* in the San Francisco Bay region. Permittees are required to implement a pesticide toxicity control program that addresses their own use of pesticides and use by others within their jurisdictions. The focus is on pesticides that pose a threat to water quality, including applications with the potential to enter the municipal stormwater conveyance system.

Most MRP-required Provision C.9 tasks are implemented by each individual San Mateo County Permittee. SMCWPPP helps agency staff to understand MRP requirements and develops various tools that assist agency staff to effectively plan, implement, and report on compliance activities. SMCWPPP's assistance with Provision C.9 is coordinated through SMCWPPP's Parks Maintenance and Integrated Pest Management (IPM) Work Group, except that Provision C.9.h., the public outreach portion of Provision C.9, is implemented via SMCWPPP's Public Information and Participation (PIP) component.

IMPLEMENTATION OF MRP PROVISIONS

During FY 2021/22, SMCWPPP performed a number of tasks to assist member agencies with implementation of Provision C.9, with input and assistance provided by the Parks Maintenance and IPM Work Group. Accomplishments included the following:

- Held one meeting of the Parks Maintenance and IPM Work Group.
- Conducted SMCWPPP's Annual Landscape IPM Training Workshop in March 2022.
- Continued coordinating with San Mateo County Agriculture / Weights and Measures.
- Updated the pesticides tracking template with the current two years of pesticide product data from the Department of Pesticide Regulation (DPR) website.
- Participated in relevant BAMSC and CASQA activities.
- Continued to maintain retail partnerships with 10 top-tier stores (e.g., Home Depot and Hassett Ace Hardware) that sell pesticides/fertilizers within San Mateo County. Tasks included ordering materials, organizing outreach collateral, checking in with store managers, and providing outreach to residents.
- Conducted two online webinars with an IPM Advocate in association with Our Water Our World to educate residents about less toxic alternatives to commercial pesticides and fertilizers. We had 298 registrants, 153 attendees, and 92 feedback surveys taken.
- The IPM Advocate also conducted in-person outreach at popular hardware stores with three events in the fall and three events in the spring.

- Updated license status information in a database of San Mateo County pest control operators.
- Sent an email or mailed a letter to active-licensed pest control operators in San Mateo County.

More information on each of these accomplishments is provided below.

Parks Maintenance and IPM Work Group

The Parks Maintenance and IPM Work Group provides the opportunity for sharing information about MRP Provision C.9 requirements and approaches for achieving compliance. Richard Holtz from the City of Burlingame chaired the work group. The Parks Maintenance and IPM Work Group met one time in FY 2021/22. The attendance list is included in Appendix 9.

Annual Landscape Integrated Pest Management Workshop

The annual SMCWPPP Landscape IPM Workshop was held online on March 16, 2022. The workshop was attended by 84 municipal staff and contractors and covered the following topics:

- Pesticides and Water Quality
- IPM for Weed Management in Urban areas
- IPM Techniques for New Urban Pests
- IPM for Vegetation Maintenance in Bioretention Areas
- Regulatory Update and Common Violations

Evaluation forms completed by the workshop's attendees indicated that overall, the workshop was beneficial and met their expectations. Appendix 9 includes the workshop agenda, attendance list, and a summary of the evaluations. Other workshop materials are available on the SMCWPPP website (flowstobay.org).

Coordination with San Mateo County Department of Agriculture

As in past years, San Mateo County Agriculture / Weights and Measures staff attended the FY 2021/22 meeting of the Parks Maintenance and IPM Work Group and received information on water quality issues and the MRP. In addition, SMCWPPP worked closely with San Mateo County Agriculture / Weights and Measures staff to provide DPR Continuing Education Hours for participants in the Landscape IPM Workshop.

Pesticide Tracking Template

In FY 2016/17, SMCWPPP developed a template in Excel to assist with pesticide tracking and reporting requirements in MRP Provision C.9.a. The pesticides tracking template utilizes a lookup list of pesticides and active ingredients compiled from data tables available on the Department of Pesticide Regulation (DPR) website. The template was updated during FY 2021/22 with the current two years of pesticide product data from the DPR website.

Participation in CASQA

MRP Provision C.9.f. requires Permittees to track and participate in regulatory processes relevant to pesticide toxicity control. During FY 2021/22, SMCWPPP accomplished this task by working with CASQA.

For additional information, see the *CASQA 2022 Pesticide Annual Report and Effectiveness Assessment* included in Appendix 13. In addition, SMCWPPP staff stayed current with pesticide controls and regulatory efforts by participating in selected CASQA meetings.

SMCWPPP also provided funds toward implementing the Regional OWOW Program, which is now being managed by CASQA. SMCWPPP became a subscriber to the CASQA OWOW program in FY 2021/22. SMCWPPP staff participated in the CASQA OWOW Committee and provided input, as needed. Additional details are included in the *CASQA FY 21-22 OWOW Annual Report* included in Appendix 13.

Point of Purchase Outreach

SMCWPPP conducted point-of-purchase outreach to home improvement store consumers at frequently visited stores (e.g., Home Depot and Hassett Ace Hardware), providing tips to residents about the proper use and disposal of pesticides and other lawn and garden chemicals. Through a partnership with a sub-consultant, Charlotte Canner (an IPM Advocate in association with [Our Water Our World](#)), SMCWPPP was also able to provide the public with a credible and reliable source of information at tabling events. Charlotte educated consumers and store employees about proper pesticide use, less toxic pesticide options, and effective alternatives to pesticides. Tabling events were held at larger store locations to maximize the outreach effort. Tabling events were promoted via Facebook, the SMCWPPP event calendar, and through the PIP Subcommittee members.

SMCWPPP's in-store tabling events consisted of educating consumers about: (1) stormwater runoff, (2) the role residents play in reducing pesticide use, (3) the less-toxic pesticides sold in the store, and (4) proper usage of pesticides and current pest problems/less-toxic solutions to these problems. A total of 155 consumers were engaged with directly. Table 9-1 below summarizes the six tabling events held during FY 2021/22. Appendix 9 Figure 9a-1 shows photographs from tabling events. Appendix 9 Figure 9a-2 presents graphics designed to promote the events.

Program materials were provided directly to the public via point-of-purchase displays during tabling events, a time that residents may be most receptive to hearing our message. Additionally, shelf talkers were placed next to products certified less toxic by the Our Water Our World (OWOW) program and topic-specific factsheets from OWOW were re-stocked during quarterly store visits that Charlotte conducted throughout the fiscal year. All of these efforts helped to promote the regional OWOW program. Table 9-2 lists the 10 stores that currently participate in the OWOW point-of-purchase program. Appendix 9 Figure 9a-3 shows photographs from store visits.

Charlotte, our POP subconsultant, was also our expert instructor for two IPM-focused webinars. The webinars educated residents about proper pesticide use, less toxic pesticide options, and effective alternatives to pesticides. Each webinar had specific topics tailored to the season it was being taught in. Below are the titles and dates of each webinar during FY 2021/22:

- October 6, 2021 - Fall Tips for a Pest-Free Garden
- March 12, 2022 - Spring Blooming: Eco-Friendly Weed Management Webinar

The online events were promoted via Facebook, Instagram, the SMCWPPP event calendar, the SMCWPPP mailing list, and through the PIP Subcommittee members and local partners. Table 9-3 provides data from the IPM-focused webinars.

Table 9-1. FY 2021/22 San Mateo County IPM In-store Tabling Events

Store	Date of Tabling Event	Number of People Engaged With	Number of Surveys Taken
Home Depot, San Mateo	9/25/2021	30	N/A
Home Depot, Colma	10/02/2021	21	4
Home Depot, East Palo Alto	11/06/2021	14	4
Home Depot, San Mateo	03/26/2022	28	10
Hassett Ace Hardware, Redwood City	04/23/2022	32	4
Home Depot, Colma	05/21/2022	30	5

Table 9-2. FY 2021/22 San Mateo County Participating OWOW Hardware Stores

Store Name	Address	City
Brisbane Hardware	1 Visitacion Ave.	Brisbane
Hassett Ace Hardware	1029 Alameda de las Pulgas	Belmont
Hassett Ace Hardware	545 1 st Ave.	San Mateo
Hassett Ace Hardware	111 Main St.	Half Moon Bay
Hassett Ace Hardware	282 Woodside Plaza	Redwood City
Home Depot	2 Colma Blvd.	Colma
Home Depot	303 Lake Merced Blvd.	Daly City
Home Depot	1781 E Bayshore Rd.	East Palo Alto
Home Depot	2001 Chess Dr.	San Mateo
Lyngso Garden Materials, Inc	345 Shoreway Rd.	San Carlos

Table 9-3. FY 2021/22 IPM-Focused Webinar Data

Dates	Webinar Name	Number of Attendees	Number of Registrants	Attendee Rate	Number of Surveys Taken
10/06/21	Fall Tips for a Pest-Free Garden	65	111	58%	31
03/12/22	Spring Blooming: Eco-Friendly Weed Management Webinar	88	187	47%	61

For each of the two webinars, SMCWPPP:

- Conducted the following before each webinar: Set up a registration page on Zoom, created Facebook and Instagram posts on our feed and Story, and sent an e-newsletter to our mailing list. We also conducted outreach to the PIP members and local organizations to help spread awareness about our webinars. Some noteworthy about our process is that we set up unique URLs on the Zoom registration page for each promotional source, so we inform promotional strategy for our next webinar; this helps us learn what worked well and what didn't, which can influence strategy for future webinar promotional campaigns.
- Conducted the following during the webinar: Polls were launched during the webinar, which attendees answered. We received questions during the webinar, the majority of which were answered live by the expert instructor.
- Conducted the following after the webinar: A feedback survey was sent shortly after each webinar. As an incentive to take the survey, we have a winner or winners randomly selected to receive a gift card to a local hardware store of their choice to help implement the practices discussed during the webinar. We shared an email to webinar registrants with resources mentioned during the webinar, a recording of the full webinar, and often, shorter tip-focused clips from the webinar recording. Our [YouTube page](#) and [embedded on our website's "Pest Management"](#) page are webinar recordings and shorter clips.

Appendix 9 Figure 9a-4 provides screenshots captured during this fiscal year's webinars. Appendix 9 Figure 9a-5 shows graphics designed to promote the webinars.

Promotional Campaign Results – October Webinar

- 5,177 total Facebook reach on posts
- 1191 total Instagram reach on posts
- 15 total page views on event within SMCWPPP's website Events Calendar
- 4,698 total reach for Facebook event
- 163 total event responses for Facebook events about the webinar
- 1,425 total opens for e-Newsletter about the webinar
- 144 total clicks to Zoom registration page for the webinars on the relevant e-Newsletter

Promotional Campaign Results – March Webinar

- 525 total Facebook reach on posts
- 224 total Instagram reach on posts
- 56 total page views on event within SMCWPPP's website Events Calendar
- 2,286 total reach for Facebook event
- 57 total event responses for Facebook events about the webinar
- 2,122 total opens for e-Newsletters about the webinar (2)
- 177 total clicks to Zoom registration page for the webinars on the relevant e-Newsletter

Lastly, Charlotte also prepared twice monthly “Simple Tip” social media posts discussing a seasonal pest, identification, life cycle, prevention, and control options. See Appendix 9 Figure 9a-6 for examples of these posts.

Pest Control Contracting Outreach

During FY 2021/22, SMCWPPP also implemented outreach that directly targeted residents and pest control contractors, to (1) encourage San Mateo County communities to reduce their reliance on toxic pesticides that threaten water quality, (2) encourage public and private landscape irrigation practices that minimize pesticide runoff, (3) promote appropriate disposal of unused pesticides, and (4) encourage residents to hire pest control professionals that use IPM practices.

SMCWPPP conducted this outreach via Facebook and Instagram. Examples of Facebook posts are shown in Figure 9-1 and Instagram posts in Figure 9-2.

The following is a breakdown of posts related to pest control promoted during FY 2021/22:

- Facebook
 - 54 posts
 - 951 Engagements (likes, comments, shares, and link clicks)
 - 33,818 reach
- Instagram
 - 54 posts
 - 469 Engagements (likes, comments, shares, and saves)
 - 8,295 reach

In addition to social media posts, SMCWPPP stocked OWOW fact sheets detailing IPM approaches to various pest-related problems, as well as resources for hiring pest control companies and disposing of pesticides responsibly in literature racks at the hardware stores listed in Table 9-2.

To help fulfill the MRP Provision C.9.e.ii.(3) requirement for outreach to pest control operators, the Countywide Program incorporated direct outreach to pest control operators. The aim of this outreach was to inform pest control operators of the hazards of pesticides and to encourage the reduction of their usage. Prior to outreach, the SMCWPPP team reviewed the Department of Consumer Affairs (DCA) License Database and updated our database of San Mateo County pest control operators accordingly. Research was conducted for active pest control operators’ email addresses as needed. We created a page dedicated to pest control professionals on the SMCWPPP website. The page can be viewed in Figure 9-3 or by visiting: flowstobay.org/preventing-stormwater-pollution/at-home/pestpro.

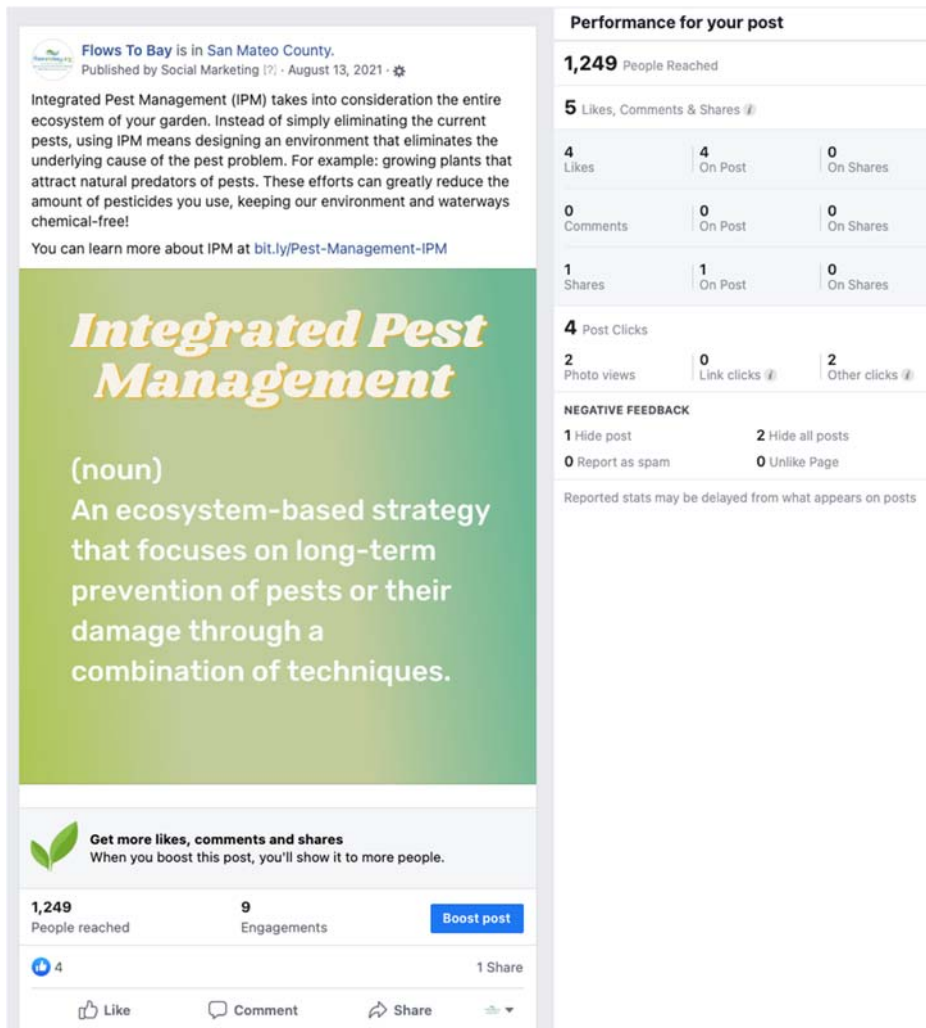
The SMCWPPP team then developed content for a letter (Appendix 9 Figure 9b-1) to be sent via email for active pest control operators with an email address we were able to locate, and those that did not have one listed after conducting research received the letter via mail. The letter focused on: 1) The critical role pest control professionals in San Mateo County play in keeping pesticides out of our waterways, 2) Encourage pest control professionals to adopt IPM practices to help minimize the negative effects on water quality and aquatic life, and 3) Steps are listed for certifications. The letter was sent on June 3rd, 2022.

Results of Outreach (Table 9-4)

- 45 active-licensed pest control operators in our database
- 38 pest control operators received the letter via email
- 10 pest control operators received the letter via mail


Table 9-4. FY 2021/22 outreach results with licensed pest control operators

Number of Active-Licensed Pest Control Operators	Received Letter via Email	Received Letter via Mail
45	38	10




The image shows a Facebook post from 'Social Marketing' published on August 13, 2021. The post title is 'Flows To Bay is in San Mateo County.' The main text describes Integrated Pest Management (IPM) as an ecosystem-based strategy for pest prevention. A large green graphic contains the title 'Integrated Pest Management' and a definition: '(noun) An ecosystem-based strategy that focuses on long-term prevention of pests or their damage through a combination of techniques.' The post has 1,249 people reached and 9 engagements. The analytics panel on the right shows 5 likes, comments, and shares, 4 post clicks, and 2 photo views. It also lists negative feedback options like 'Hide post' and 'Report as spam'.

Post details


 **Flows To Bay is in San Mateo County.**
Published by Social Marketing (7) · October 26, 2021 · 🌐

Chemical pesticides are not the only way to treat sick plants! A more environmentally friendly approach is to address the underlying issue and prevent the sickness in the first place. One example of this is watering your plants in the early morning rather than evening so they have time to dry out before nighttime. This will help prevent attracting fungal diseases and slugs.

Learn more about Integrated Pest Management here:
<https://bit.ly/Pesticides-No-Thanks>



IPM TIP!
Water plants in the early morning so they have time to dry out before nighttime. This will prevent wet soil from attracting slugs and fungal diseases at night.

 **Get more likes, comments and shares**
When you boost this post, you'll show it to more people.

1,039 People reached **55** Engagements [Boost post](#)

👍 29 1 Comment 11 Shares

👍 Like 💬 Comment ➦ Share

Performance for your post

1,039 People Reached

43 Likes, Comments & Shares 🌐

31 Likes	29 On Post	2 On Shares
1 Comments	1 On Post	0 On Shares
11 Shares	11 On Post	0 On Shares

12 Post Clicks


7 Photo views	0 Link clicks 🌐	5 Other clicks 🌐
----------------------	------------------------	-------------------------

NEGATIVE FEEDBACK


0 Hide post	1 Hide all posts
0 Report as spam	0 Unlike Page

Reported stats may be delayed from what appears on posts

Post details


 **Flows To Bay is in San Mateo County.**
Published by Social Marketing (7) · May 29 · 🌐

Wondering how to cut down on fertilizers, pesticides, and water in your garden? Our pest management expert Charlotte recommends using organic mulch to help your garden thrive!



IPM Tips
Using an **organic mulch** like bark, straw, leaves, or compost provides many benefits to your soil and garden:

- Prevents weeds
- Reduces soil compaction and erosion
- Adds nutrients to the soil
- Reduces water evaporation, keeping moisture in the soil
- Regulates the temperature of the soil
- Provides habitat for many beneficial insects

 **Get more likes, comments and shares**
When you boost this post, you'll show it to more people.

1,043 People reached **17** Engagements [Boost post](#)

👍 14

👍 Like 💬 Comment ➦ Share

Performance for your post

1,043 People Reached

14 Likes, Comments & Shares 🌐

14 Likes	14 On Post	0 On Shares
0 Comments	0 On Post	0 On Shares
0 Shares	0 On Post	0 On Shares

3 Post Clicks

2 Photo views	0 Link clicks 🌐	1 Other clicks 🌐
----------------------	------------------------	-------------------------

NEGATIVE FEEDBACK

0 Hide post	0 Hide all posts
0 Report as spam	0 Unlike Page

Reported stats may be delayed from what appears on posts

Figure 9-1. Examples of Facebook posts promoting pesticide pollution prevention



flowstobay
Michael James Greco · The Caterpillars

flowstobay Sign up for our free webinar "Fall Tips for a Pest-Free Garden" here: bit.ly/pest-free-garden-fall

#webinar #gardening #garden #gardentips #fall #sustainability #ecofriendly #autumn #pestmanagement #IPM #sanmateocounty

45w

Like Comment Share

Liked by **burlingameparentsclub** and 8 others

OCTOBER 1, 2021

Add a comment... Post



flowstobay

flowstobay Spraying chemical pesticides can be seriously harmful to bees and other pollinators. It's always best to use less toxic pesticide alternatives, and follow these tips for reducing the impact pesticides have on pollinators.

Visit ipm.ucanr.edu/beeprecaution to look up bee precaution pesticide ratings by product. Thanks for this resource @SFBayGardeners! Also, you can visit bit.ly/Pesticides-No-Thanks for more information on choosing less toxic pesticides!

#bee #beefriendly #pollinators #savethebees #pollinatorgarden #gardening #gardentips #ecofriendly #IPM #pesticides #sustainability #SanMateoCounty

48w

View insights

Like Comment Share

Liked by **grassrootecology** and 10 others

SEPTEMBER 7, 2021

Add a comment... Post

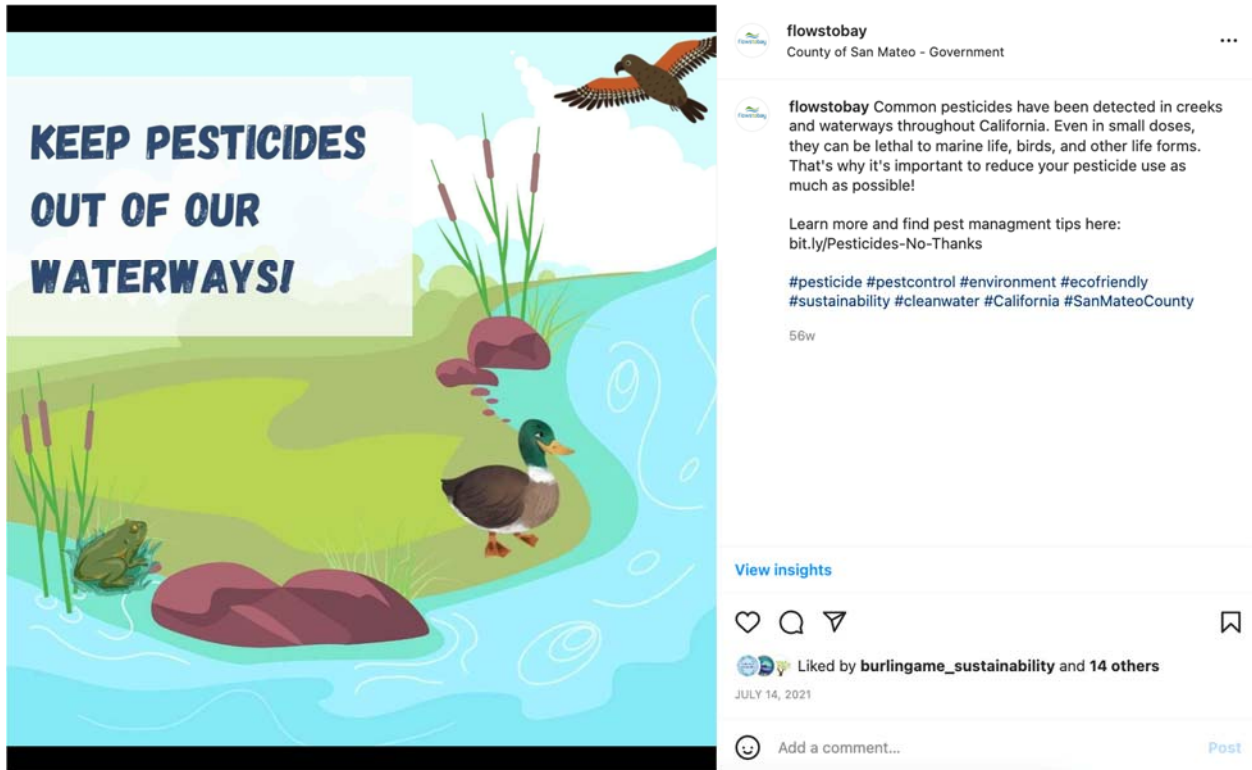


Figure 9-2. Examples of Instagram posts promoting pesticide pollution prevention



ON THIS PAGE

PESTICIDES & WATER QUALITY

ABOUT INTEGRATED PEST MANAGEMENT

IPM CERTIFICATION FOR PEST CONTROL PROFESSIONALS

IPM PEST CONTROL OPERATORS IN SAN MATEO COUNTY

SAFE PESTICIDE DISPOSAL

SEARCH SITE

Search ...

SEARCH

Pesticides & Water Quality

Pest control professionals in San Mateo County play a critical role in keeping pesticides out of our local creeks, the San Francisco Bay, and the Pacific Ocean. **We need your help to protect our waterways from pesticides that may be mobilized during storm events after being applied.**

Water quality monitoring data in San Mateo County Show ongoing toxicity impacts in local creeks related to the application of structural pest control products, including pyrethroids and fipronil, among others. Because of this, we encourage all pest control professionals who work in San Mateo County to adopt Integrated Pest Management (IPM) practices to help minimize the negative effects on water quality and aquatic life.

About Integrated Pest Management



Figure 9-3. Screenshots of “Pest Control Professionals” web page on the Flows To Bay website

FUTURE ACTIONS

FY 2022/23 activities planned by SMCWPPP to assist San Mateo County Permittees understand and comply with requirements in Provision C.9 of the reissued municipal stormwater permit (MRP 3.0) include the following:

- Continue to assist member agencies implement their IPM programs and policies, with input and assistance provided by the Parks Maintenance and IPM Work Group;
- Continue holding Parks Maintenance and IPM Work Group meetings once per year;
- Continue conduct annual landscape and/or structural IPM training workshops;
- Continue to coordinate with County Agriculture / Weights & Measures;
- Coordinate and execute additional online events related to water pollution prevention;
- Launch promotional campaigns to promote online events;
- Continue using signage and materials developed by OWOW for the point-of-purchase program and continue to subscribe to the OWOW program via CASQA;
- Perform outreach messaging to residents on best practices for hiring pest control contractors certified in IPM via fact sheets, SMCWPPP's website (flowstobay.org), social media posts, and a quarterly newsletter; and
- Send direct mailers and email communications to pest control professionals that encourage IPM certification and education.

SECTION 10

C.10 TRASH LOAD REDUCTION

INTRODUCTION

MRP Provision C.10 Trash Load Reduction tasks are implemented by each San Mateo County Permittee. SMCWPPP helps agency staff to understand trash load reduction requirements and develops various tools needed to effectively plan, implement, and report on compliance with the requirements. Provision C.10 requires Permittees (as applicable) to:

- Reduce trash discharges from 2009 levels by 70% by July 2017 and 80% by July 2019.
- Ensure that lands that do not own or operate but that are plumbed directly to their storm drain systems in Very High, High and Moderate trash generation areas are identified and equipped by full capture systems or managed to a level equivalent to full capture systems;
- Install and maintain full capture systems that treat a mandatory minimum acreage;
- Assess trash reductions associated with control measures other than full capture systems using a visual assessment protocol;
- Develop and implement a receiving waters trash monitoring program plan;
- Annually cleanup and assess a mandatory minimum number of creek/shoreline trash hotspots; and
- Maintain a Long-Term Trash Load Reduction Plan designed to achieve 100% trash reduction.

During FY 2021/22, SMCWPPP completed the tasks described below in support of member agency trash management activities conducted in compliance with the above requirements.

IMPLEMENTATION OF MRP PROVISIONS

SMCWPPP performs a variety of tasks to assist San Mateo County Permittees with implementation of MRP Provision C.10 and the requirements listed above, with input and assistance provided by the SMCWPPP Trash Subcommittee and the SMCWPPP Litter Work Group. FY 2021/22 accomplishments included the following:

- Coordinated and facilitated three meetings of SMCWPPP's Trash Subcommittee and one meeting of SMCWPPP's Litter Work Group;
- Assisted San Mateo County Permittees in delineating trash full capture treatment areas and managing trash full capture information in GIS (currently > 10,000 acres are treated by full capture systems in San Mateo County);
- Continued to implement SMCWPPP's Trash Assessment Strategy, including conducting 677 On-land Visual Trash Assessments (OVTAs) at 233 sites and maintaining the Countywide Program's

online OVTA database to allow San Mateo County Permittees access to timely load reduction estimates;

- Continued providing guidance to San Mateo County Permittees on MRP operation and maintenance requirements and standard operating procedures for trash full capture systems;
- Compiled and standardized data from 53 trash hot spot assessments and cleanups, and entered the data into the SMCWPPP hot spot database;
- Completed data analysis and interpretation tasks as part of the SMCWPPP Litter Characterization Study;
- Planned the Litter Work Group's 5th Roundtable Event to provide the results of the Litter Characterization Study, and share information on best practices of litter and single-use plastic food service ware;
- Coordinated with Caltrans, the Alameda County Illegal Dumping Task Force and the CalRecycle Illegal Dumping Technical Advisory Committee on programs and best practices for reducing illegal dumping in communities;
- Coordinated with the SMCWPPP Public Information and Participation (PIP) Subcommittee on public outreach efforts targeting litter reduction;
- Conducted an expanded countywide analysis to identify additional/revised large full trash capture systems that address Caltrans and SMCWPPP member agency trash generating areas (including re-evaluation of catchments with small full trash capture systems already installed);
- Coordinated with Daly City / Colma, Caltrans, and the Regional Water Board on the potential installation of a large trash full-capture system through a cooperative implementation agreement;
- Assisted San Mateo County Permittees in developing information necessary for reporting trash load reductions with their FY 2021/22 Annual Reports.

More information on each of these accomplishments is provided below.

Trash Subcommittee

SMCWPPP's Trash Subcommittee assists San Mateo County Permittees with the implementation of new or enhanced trash control measures and actions required by the MRP. The Trash Subcommittee generally meets quarterly. Additional meetings are scheduled as necessary to address high priority issues.

During FY 2021/22, SMCWPPP staff facilitated three Trash Subcommittee meetings, which were chaired by Chris Sommers (EOA, Inc.). The Trash Subcommittee continued to have excellent participation by municipal staff and other stakeholders, as shown in the FY 2021/22 attendance list (Appendix 10).

During the Trash Subcommittee meetings in FY 2021/22, Subcommittee members discussed and provided input on the following topics/projects:

- C.10 requirements in the MRP;
- Discussions with Water Board staff on planned requirements in MRP 3.0 Provision C.10;
- SMCWPPP Litter Work Group activities, reports, and work plan;
- Countywide expanded analysis of potential large trash full capture locations associated with

Caltrans ROW;

- The development of a grant application by C/CAG for funding from the Clean California Initiative to fund illegal dumping prevention and cleanups activities throughout the county;
- New or planned installations of trash full capture systems in San Mateo County Permittee jurisdictions;
- The FY 2021/22 Annual Report format for Provision C.10;
- Other opportunities for collaboration with Caltrans; and
- SMCWPPP Trash Assessment Strategy, including OVTAs conducted in Trash Management Areas (TMAs).

Demonstration of Trash Load Reductions (C.10.a.ii.)

SMCWPPP developed the *Pilot Trash Assessment Strategy (Strategy)* in FY 2013/14 on behalf of San Mateo County Permittees. The Strategy was submitted to the Regional Water Board on February 3, 2014, as part of San Mateo County Permittee Long-Term Trash Load Reduction Plans and was intended to serve as version 2.0 of the trash tracking method required by the Permit. SMCWPPP began to implement the Strategy in FY 2013/14 and continued to implement it at a full-scale in FY 2021/22 on behalf of (and in collaboration with) all San Mateo County Permittees.

The Strategy is intended to provide information on the magnitude and extent of trash reductions associated with stormwater in the San Mateo County. It is consistent with trash monitoring, assessment, and reporting requirements in the MRP and is primarily designed to answer the following core management question:

Have MS4 trash load reduction targets (i.e., 40%, 70%, and No Adverse Impacts) been achieved by San Mateo County Permittees?

The primary environmental and programmatic indicators that SMCWPPP and San Mateo County Permittees currently track to answer this core management question are:

1. **Full Capture Systems** – The extent of areas effectively treated by trash full capture devices and the operation and maintenance of these devices;
2. **Other Trash Controls** – Reductions in the levels of trash observed on-land and available to enter MS4s;
3. **Source Controls (Credits)** – Reductions in the levels of litter prone items observed in the environment that are subject to source controls, such as ordinances that limit or prohibit the distribution of specific types of items;
4. **Additional Creek and Shoreline Cleanups (Offset)** – The volumes of trash removed via creek and shoreline cleanup events (above and beyond those required by the MRP); and
5. **Direct Discharge Programs (Offset)** – The extent and magnitude of trash removed or prevented from entering a receiving water body from pathways other than stormwater that are directly impacting those water bodies (e.g., illegal dumping or illegal encampments).

In selecting the indicators above, San Mateo County Permittees recognized that multiple indicators can provide the information necessary to definitively determine that progress has been made to reduce trash

discharged from MS4s. SMCWPPP's methods used to collect or track information on the primary indicators 1 - 4 listed above are briefly described below, along with summaries of associated activities conducted by SMCWPPP in FY 2021/22. Methods used to assess indicator 5 have not been implemented to-date because none of the San Mateo County Permittees has submitted or implemented an optional direct discharge plan as outlined in the MRP. Additional information and the results of data collected to support indicators 1 - 4 are found in Section 10, Provision C.10.b.ii., Parts A and B, of individual San Mateo County Permittee FY 2021/22 Annual Reports.

1. Full Capture Systems (Including Operation and Maintenance)

Devices and facilities meeting the trash full capture design criteria described in the MRP and certified by the State Water Resources Control Board (State Water Board) are effective trash controls if adequately maintained to ensure their capture efficiency. Consistent with the Long-Term Plan Framework and the State Water Board's Trash Amendments, if a full capture device is maintained effectively then trash from the area draining to the device is effectively reduced to a level of "no adverse impacts" and has achieved the ultimate trash reduction benchmark outlined in the MRP (i.e., 100% reduction). Additional trash reductions, therefore, are not needed in areas draining to (and treated by) full capture systems to demonstrate compliance with the MRP benchmarks.

From FY 2013/14 through FY 2021/22, SMCWPPP and San Mateo County Permittees have expended considerable time and resources identifying and mapping areas draining to full capture devices, using a combination of fieldwork and desktop Geographical Information System (GIS) analysis. Drainage areas for newly installed full capture devices are delineated and mapped as part of an annual update of individual San Mateo County Permittee full-capture device GIS data layers. As a result, all drainage areas have been delineated for all devices installed to-date in San Mateo County. More than 10,000 acres of land area is currently treated by full capture systems in San Mateo County. Trash reductions associated with these areas are calculated based on the baseline trash generation levels established on San Mateo County Permittee baseline trash generation maps and are reported in individual Permittee Annual Reports (see Section C.10).

Additionally, SMCWPPP completed the development of a Model Trash Full Capture Device O&M Verification Program in FY 2015/16. The O&M Verification Program is intended to ensure that devices are operated at a level necessary to maintain their full capture designation. In FY 2021/22, SMCWPPP continued to provide guidance to San Mateo County Permittees on O&M requirements and standard operating procedures developed for San Mateo County Permittees as part of the Model Verification Program. San Mateo County Permittees with full capture devices have an O&M verification program tailored to fit the types of devices in their stormwater conveyance system and the associated maintenance procedures needed to adequately maintain these devices. Individual San Mateo County Permittee Annual Reports provide information regarding O&M of full capture devices and any associated issues with the devices (see Section 10, Provision C.10.b.i.).

2. Other Trash Control Measures (via On-land Trash Visual Assessments)

In FY 2013/14, SMCWPPP developed a pilot approach to assess trash reductions on land areas that generate substantial levels of trash (i.e., very high, high, or moderate trash generation) and are not treated by full capture devices. The approach uses on-land visual trash assessment (OVTA) protocols to record changes in the levels of trash on streets, sidewalks, and properties over time. The assessment protocols score sites/areas using a 4-tier system (A - D, A being the least amount of trash). The four OVTA scoring categories correspond with the four trash generation rate categories (i.e., low-

A; moderate-B; high-C; and very high - D) and the associated weighting factors (i.e., 0, 1, 4, 12) included in the MRP.

Consistent with the MRP, OVTAs are conducted at randomly selected street/sidewalk sites representing at least 10% of the applicable street miles in each trash management area (TMA) where trash reductions are being reported by San Mateo County Permittees. OVTAs are conducted at a frequency necessary to confidently detect reductions in trash levels at these sites. Based on the findings of the *Tracking California’s Trash* State Water Resources Control Board funded project, conducting between 4 and 6 assessments on average at a site will allow improvements in trash levels to be detected with an acceptable level of confidence. Currently, SMCWPPP annually conducts roughly three assessments at each site each FY and then averages two FYs of data to calculate trash load reductions in a given FY. For example, in reporting reductions for FY 2021/22, results from assessments conducted in both FY 2020/21 and FY 2021/22 were averaged and used to represent the “current” levels of trash within the applicable land areas.

During FY 2021/22, SMCWPPP staff conducted 677 OVTAs at 233 assessment sites (averaging 1,000 feet in length). All OVTA sites were assessed at least two times during FY 2021/22, and most were assessed three times. During a typical year, all sites are assessed three times. Table 10-1 summarizes the number of OVTAs conducted each fiscal year from FY 2014/15 through FY 2021/22.

Table 10-1. Number of OVTAs completed in San Mateo County by fiscal year.

FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY 20/21	FY 21/22
601	688	499	827	704	562	788	677

Assessment results are stored in an online OVTA Database that provides real-time access to Permittees. In FY 2021/22, SMCWPPP staff entered assessment results within one week of conducting an assessment, which provided San Mateo County Permittee staff with timely access to the results.

3. Source Controls (Via Surveys and Characterization Studies)

San Mateo County Permittees are implementing actions to reduce the sale or distribution of litter-prone items and stop litter at its source. These source controls include the adoption and enforcement of ordinances enacted by San Mateo County Permittees to eliminate the distribution of single-use plastic grocery bags and expanded polystyrene (EPS) food service ware in their jurisdictions. To assist San Mateo County Permittees in determining to what degree these ordinances have reduced the level of these products found in the environment, SMCWPPP used the findings of a study conducted in Santa Clara County between March 2015 and July 2017. As part of the study, debris and trash were collected from large and small full-capture treatment systems within jurisdictions that have installed these devices.

Results from the project, which characterized the number of bags and volume of EPS observed in trash full capture systems pre- and post-ordinance, indicate that on average 72% fewer single-use plastic grocery bags and 74% less EPS food service ware was observed in storm drains systems after the ordinances went into effect. Along with other lines of evidence, these observed average reductions are used by San Mateo County Permittees to demonstrate trash load reductions associated with the

implementation of these ordinances. For additional details on results of the project, see the *Storm Drain Trash Monitoring and Characterization Project Technical Report* provided in Appendix 10.1 of the Santa Clara Valley Urban Runoff Pollution Prevention Program's FY 2015/16 Annual Report.

4. Additional Creek and Shoreline Cleanups (via volumes of trash removed from waterways)

San Mateo County Permittees are also allowed to claim up to a 10% trash load reduction for conducting trash cleanups in local water bodies above and beyond cleanups required by the MRP. SMCWPPP assists San Mateo County Permittees by calculating load reductions associated with these efforts based on the volumes of trash reported. Load reductions associated with these efforts are calculated based on methods described in the MRP and are reported in Section C.10.c. of individual San Mateo County Permittee Annual Reports.

5. Direct Discharge Programs

To-date, San Mateo County Permittees have not submitted or implemented an optional direct discharge plan as outlined in the MRP.

Trash Hot Spot Cleanup and Assessment Guidance

Provision C.10.c.i. of the MRP requires Permittees to clean up trash hot spots to a level of “no visual impact” at least annually over the permit term. To assist Permittees in meeting this requirement, SMCWPPP developed the necessary tools (i.e., guidance memorandum, Trash Hot Spot Cleanup Data Collection Form, and Trash Hot Spot Activity Reports) used to report trash hot spot assessment and cleanup activities conducted during the reporting period. Trash Hot Spot Activity Reports for each Permittee are included in individual San Mateo County Permittee Annual Reports.

During FY 2021/22, San Mateo County Permittees continued conducting annual cleanups and assessments required by the MRP. Results from this year's annual cleanups indicated that a total of 53 trash hot spot assessments and cleanups were conducted within San Mateo County Permittee jurisdictions. Approximately 108 cubic yards of trash was removed from these 53 hot spots during FY 2021/22.¹ The timing of annual assessments and cleanups vary among hot spots due to the location of the hot spot, potential for natural resource impacts, crew availability, and other site-specific factors.

BASMAA Final Receiving Water Trash Monitoring Report

Permit Provision C.10.b.v. requires public agencies to develop, submit and test a Receiving Water Trash Monitoring Program Plan (Trash Monitoring Plan). In July 2017, the Bay Area Stormwater Management Agencies Association (BASMAA) submitted the first iteration of the Trash Monitoring Plan to Water Board staff for review and comment. The Final Trash Monitoring Plan that addressed all comments was submitted to Water Board staff in October 2017. Implementation of the Trash Monitoring Plan represents the “pilot-testing phase” of trash receiving water monitoring in the San Francisco Bay Area, during which the pilot protocols and methods were applied during the MRP 2.0-specified timeframe of October 2017 to July 2020.

¹Only hot spot cleanups and assessments conducted in compliance with MRP provision C.10.b.iii. are included in this estimate. Some SMCWPPP San Mateo County Permittees conduct cleanups at trash hot spots more frequently than the MRP-required annual cleanup, and/or at more sites than the MRP requires. See Section 10, C.10.e. of San Mateo County Permittee Annual Reports for additional information.

The results of the testing phase of the Trash Monitoring Plan were submitted to the Water Board as a Final Report on July 1, 2020. The Final Report provides analysis of all information/data collected from trash assessments and monitoring conducted between October 2017 and March 2020. Monitoring Plan objectives and scientific monitoring questions outlined in the Trash Monitoring Plan were used to guide the evaluation of trash monitoring and assessment data results presented in the Final Report.

Coordination with San Mateo Countywide Recycling Committee

To increase coordination among solid waste and recycling programs and San Mateo County Permittee MS4 trash reduction activities, SMCWPPP staff began attending Countywide Recycling Committee meetings in FY 2012/13. SMCWPPP continued to coordinate with the Recycling Committee in FY 2021/22, specifically targeting outreach and coordination with municipally solid waste/recyclables haulers in San Mateo County to reduce trash impacts associated with inadequate waste container management. SMCWPPP staff also coordinated with the Recycling Committee on collection activities, PCBs and demolition regulations, litter reduction and zero waste building design and operation, source reduction policies, and zero waste programs.

Litter Work Group

SMCWPPP's Litter Work Group, which was formed in March 2014, coordinates litter reduction efforts among SMCWPPP, waste and stormwater program staff from San Mateo County municipalities, the San Mateo Countywide Recycling Committee, and franchised waste collection and processing companies serving those jurisdictions. The Litter Work Group met virtually one time in FY 2021/22. Attendees included representatives from fifteen San Mateo County municipalities (especially stormwater and zero waste program staff), representatives from two local hauling companies, staff from Rethink Waste (the South Bayside Waste Management Authority) and Caltrans to work on litter reduction efforts both in Santa Clara and San Mateo Counties. The goals of the Litter Work Group include developing a litter reduction program for San Mateo County related to waste issues and specific to its needs, developing BMPs for the waste collection industry, reducing the prevalence, impacts and cost of illegal dumping, educating the public and those involved with litter control efforts, producing guidance on building design and operation related to litter and waste reduction and coordinating and sharing information with the Zero Litter Initiative (ZLI) in Santa Clara County.

The Litter Work Group completed or started the following tasks in FY 2021/22:

- Held one Work Group virtual meeting on November 17, 2021. Attendance by municipal staff is provided in the FY 2021/22 attendance list (Appendix 10). In addition to staff from fifteen municipalities and the Countywide program, attendees included representatives from Caltrans, Rethink Waste, Republic Services and South San Francisco Scavenger Company.
- Shared information and coordinated with CalRecycle, the Zero Litter Initiative (ZLI) in the Santa Clara Valley and Upstream, a national organization working to increase the use of reusable foodware and packaging and reduce the use of single-use materials including single-use plastic foodware. Upstream has regional and national municipal committees sharing policy and implementation best practices for reducing waste.
- Completed data analysis and interpretation as part of the San Mateo County Litter Characterization Study. Data analysis and interpretation were completed in summer 2022. A draft report with results and conclusions of the Litter Characterization Study was completed in September 2022 and the Phase I report is anticipated to be finalized in October 2022.

- Coordinated with Caltrans on trash capture efforts, including the installation of trash full-capture systems through cooperative implementation agreements.
- Coordinated litter reduction action and policy development with the Zero Litter Initiative from the Santa Clara Valley.
- Coordinated with SMCWPPP's PIP Subcommittee on public outreach efforts targeting litter reduction.
- Shared information with the San Mateo Countywide Recycling Committee on litter, trash, stormwater permit requirements and activities/products of the Litter Work Group.
- Coordinated with the Alameda County Illegal Dumping Task Force and their 2nd Annual Statewide Illegal Dumping Virtual Workshop held on April 22, 23, and 24, 2022.
- Coordinated with CalRecycle's Statewide Illegal Dumping Technical Advisory Committee and attended two quarterly meetings.

Countywide Expanded Analysis of Potential Large Trash Full Capture Locations Associated with Caltrans ROW

On February 13, 2019, the Regional Water Board adopted a Cease-and-Desist Order (CDO) against Caltrans, requiring it to significantly increase the rate and extent of control measure implementation to address trash discharges from its right-of-way (ROW). To meet the CDOs required targets, Caltrans is attempting to identify trash full capture systems that would be mutually beneficial to Caltrans and MRP Permittees. To assist Caltrans in identifying these systems, on April 24, 2019, Regional Water Board staff requested that all MRP Permittees identify the following:

- Mapped drainage areas of municipal jurisdiction that abut Caltrans ROW; and
- A list of already completed, planned, or potential projects in municipal drainage areas that abut Caltrans ROW that control or would control trash from the adjacent Caltrans ROW.

In response to this request, SMCWPPP conducted a preliminary analysis and worked with San Mateo County Permittees to develop a list and series of maps illustrating completed, planned, and potential trash full capture projects in municipal drainage areas in San Mateo County that also address trash in stormwater that is generated on Caltrans ROW. The list included the following preliminary information:

- Estimated Caltrans ROW addressed by San Mateo County Permittees' existing or planned Trash Capture Systems (large and small);
- Whether the Permittee has an existing Cooperative Implementation Agreement with Caltrans on Trash Capture System(s);
- Caltrans ROW within Permittee boundaries that is not addressed by existing systems;
- Estimated Caltrans ROW that may be addressed by potential (future) trash capture systems and should be evaluated further; and
- San Mateo County Permittee contact information.

This information was submitted to Regional Water Board staff on May 31, 2019, in response to the request.

After the submittal of the information in May 2019, San Mateo County Permittees with support from SMCWPPP Program staff, continued to discuss potential cooperative agreements and reimbursements with Caltrans for existing, planned, and potential full capture systems that are mutually beneficial to Caltrans and San Mateo County Permittees. Meetings between Caltrans and SMCWPPP Permittees were coordinated by SMCWPPP to continue the discussion of opportunities. As a result of these discussions, in FY 2021/22 SMCWPPP Program staff conducted an expanded countywide analysis of potential large trash full capture locations associated with Caltrans ROW. This analysis was conducted to supplement the preliminary analysis Completed in May 2019. The analysis included a re-evaluation of catchments where small full trash capture systems have been installed by Permittees.

As part of Task 1 of the expanded analysis, a desktop evaluation was completed in January 2022 to identify which catchments drain Caltrans and San Mateo County Permittee trash generating areas. This evaluation resulted in the identification of 165 stormwater catchments, which was narrowed down to 41 based on criteria used to site large full capture systems. GIS and tabular data associated with the 41 catchments were provided to 14 San Mateo County Permittee that have trash generating areas within these catchments. Based on the input from San Mateo County Permittee staff, the 41 catchments were narrowed to 20, with 13 identified as high priority and 7 identified as moderate priority.

In March 2022, Countywide Program and San Mateo County Permittee staff conducted field visits to the 13 high priority catchments to further identify potential device locations and evaluate the feasibility of constructing large capture systems in these catchments. The field visits resulted in identification of 10 locations for large trash capture system conceptual design development. Conceptual designs were developed in late FY 2021/22 and include the results of a simplified hydrological analysis based on the 1-year, 1-hour storm for the drainage area associated with each proposed location to determine the peak flow rate. The designs also included the identification of potential system type(s) and configuration(s)/design(s), treatment areas, trash reduction benefits, preliminary capital and annual operation and maintenance costs, and site-specific considerations for each proposed large full capture system location. One-page fact sheets with conceptual designs/drawings for each proposed system location were developed to assist with further dialogue between each applicable San Mateo County Permittee and Caltrans. Final fact sheets with conceptual designs/drawings for the proposed 10 locations will be completed by the end of September 2022.

FUTURE ACTIONS

FY 2022/23 activities that are planned by SMCWPPP to assist San Mateo County Permittees comply with the Provision C.10 requirements in the reissued permit (MRP 3.0) include the following:

- Conduct a series of tasks designed to assist San Mateo County Permittees with the achievement of trash reduction benchmarks (i.e., 90% and 100%) required by MRP 3.0. Planned tasks include:
 - Re-evaluation of trash baseline maps;
 - Identification of green stormwater infrastructure (GSI) as full trash capture systems;
 - Further identification of areas draining to storm drain inlets on private property;
 - Developing a Model Trash Inspection Program/Plan that identifies an approach for addressing trash on these private land drainage areas;
 - Evaluating trash sources and recommending trash control measures for areas continuing to generate significant levels of trash;

- Assist with developing the Impracticability Report via a regional project;
- Continued implementation of the SMCWPPP trash assessment strategy designed to demonstrate progress towards MRP 3.0 trash load reduction goals;
- Continued facilitation of SMCWPPP Trash Subcommittee meetings;
- Continued maintenance of the online OVTA database;
- Continued support for long-term plan implementation and control actions for trash management, including guidance on updating/revising Long-term Plans consistent with MRP 3.0 requirements;
- Continued calculation and reporting on trash load reductions for each San Mateo County Permittee;
- Continued calculation and reporting on the amount and types of trash removed via creek and/or shoreline cleanups;
- Continued update/revision of trash generation and full capture system maps and GIS data layers in preparation for the FY 2022/23 Annual Report submittal;
- Continued implementation of the Litter Work Group tasks, through merging of the Trash Subcommittee with the Litter Work Group, including conducting the 5th Litter Roundtable, finalizing the Litter Characterization Study Phase I Report, and informing future source control actions;
- Continued coordination and information sharing with the SMCWPPP PIP Subcommittee on countywide litter reduction efforts;
- Continued coordination and information sharing with the Zero Litter Initiative in Santa Clara County;
- Continued coordination with Caltrans for trash capture device design review, purchase, installation, and maintenance agreements; and
- Continued coordination with the New Development Subcommittee (and State Water Resources Control Board) on trash load reduction credits for LID facilities.
- Apply for grant funding via EPA’s Water Quality Improvement Fund (WQIF) to support cost effect trash monitoring and load reduction strategies for BAMSC member agencies under MRP 3.0.

SECTION 11

C.11 MERCURY CONTROLS

INTRODUCTION

MRP Provision C.11 Mercury Controls implements stormwater runoff-related actions described in the San Francisco Bay mercury Total Maximum Daily Load (TMDL) water quality restoration program. SMCWPPP performs a variety of activities to address mercury in stormwater runoff in compliance with MRP Provision C.11. Some of this work is accomplished through participation in BASMAA¹ regional projects.

Efforts that address PCBs in addition to mercury are described in this section rather than Section 12 (PCBs Controls). Section 12 focuses on efforts that address PCBs only.

IMPLEMENTATION OF MRP PROVISIONS

C.11/12.a. Implement Control Measures to Achieve Mercury/PCBs Load Reductions

Efforts by SMCWPPP and San Mateo County municipalities to address MRP Provisions C.11/12.a., Implement Control Measures to Achieve Mercury/PCBs Load Reductions, are described in a separate report (*Updated Control Measures Plan for PCBs and Mercury in San Mateo County Stormwater Runoff, SMCWPPP, September 30, 2022*) that is presented in Appendix 11.

C.11/12.b. Assess Mercury/PCBs Load Reductions from Stormwater

MRP Provisions C.11/12.b., Assess Mercury/PCBs Load Reductions from Stormwater, required Permittees to submit in their 2015/16 Annual Report for Executive Officer approval an assessment methodology. The purpose of the assessment methodology is to quantify in a technically sound manner mercury and PCBs loads reduced through implementation of a variety of pollutant controls, including pollution prevention, source control, and stormwater runoff treatment measures such as green infrastructure. SMCWPPP and San Mateo County municipalities helped develop the assessment methodology through participation in a BASMAA regional project. The methodology developed via the BASMAA regional project is referred to as the Interim Accounting Methodology and has been approved by the Executive Officer of the Regional Water Board.

Permittees must report on the use of the methodology to demonstrate progress toward achieving mercury and PCBs load reductions. San Mateo County load reductions are described in the separate report mentioned in the previous section (*Updated Control Measures Plan for PCBs and Mercury in San Mateo County Stormwater Runoff, SMCWPPP, September 30, 2022*). Appendix 11 contains the report, which

¹ The Bay Area Stormwater Management Agencies Association (BASMAA) recently dissolved as a formal non-profit organization, but its members continued to meet via an informal organization called the Bay Area Municipal Stormwater Collaborative (BAMSC).

includes a description of SMCWPPP's GI inventory and describes the process to update the inventory annually.

C.11/12.c. Plan and Implement Green Infrastructure to Reduce Mercury/PCBs Loads

Permittees were required to submit in their FY 2019/20 Annual Report an estimate of the amount and characteristics of land area that will be treated through green infrastructure implementation by 2020, 2030, and 2040, including all data used and a full description of models and model inputs relied on to generate this estimate.

Permittees were also required to submit in their FY 2019/20 Annual Report a Reasonable Assurance Analysis (RAA) to demonstrate quantitatively that mercury reductions of at least 10 kg/yr will be realized by 2040 through implementation of green infrastructure projects. The MRP requires this submittal to include all data used and a full description of models and model inputs relied on to make the demonstration and documentation of peer review of the RAA.

San Mateo County Permittees fulfilled the above MRP requirements via development of a separate report that was submitted with SMCWPPP's FY 2019/20 Annual Report (*Pollutant Control Measures Implementation Plan and Reasonable Assurance Analysis for San Mateo County, California, Scenarios to Achieve PCBs and Mercury San Francisco Bay TMDL Wasteload Allocations, September 30, 2020*).

C.11/12.d. Prepare Implementation Plan and Schedule to Achieve TMDL Wasteload Allocations

MRP Provisions C.11/12.d. require that Permittees prepare a plan and schedule for mercury and PCBs control measure implementation and a corresponding RAA demonstrating quantitatively that sufficient control measures will be implemented to attain the mercury and PCBs TMDL wasteload allocations by 2028 and 2030, respectively. The plan must:

1. Identify all technically and economically feasible mercury and PCBs control measures to be implemented (including green infrastructure projects).
2. Include a schedule according to which these technically and economically feasible control measures will be fully implemented.
3. Provide an evaluation and quantification of the mercury and PCBs load reduction of such measures as well as an evaluation of costs, control measure efficiency and significant environmental impacts resulting from their implementation.

San Mateo County Permittees fulfilled this requirement via development of a separate report that was submitted with SMCWPPP's FY 2019/20 Annual Report (*Pollutant Control Measures Implementation Plan and Reasonable Assurance Analysis for San Mateo County, California, Scenarios to Achieve PCBs and Mercury San Francisco Bay TMDL Wasteload Allocations, September 30, 2020*).

C.11.e./C.12.h. Risk Reduction Program

MRP Provisions C.11.e and C.12.h require Permittees to conduct an ongoing risk reduction program to address public health impacts of mercury and PCBs in San Francisco Bay fish. The fish risk reduction program is required to include actions to reduce actual and potential health risks in those people and

communities most likely to consume San Francisco Bay-caught fish, such as subsistence fishers and their families. The program is required to have the potential to reach 3,000 individuals annually (Bay Area-wide total for all MRP 2.0 Permittees) who are likely consumers of San Francisco Bay-caught fish. Permittees are required to report on the status of the risk reduction program in each of their Annual Reports, including a brief description of actions taken, an estimate of the number of people reached, and why these people are deemed likely to consume Bay fish.

SMCWPPP is assisting San Mateo County municipalities comply with the risk reduction program requirements by coordinating with and reporting on the Fish Smart program conducted by San Mateo County Environmental Health Services (EHS). Fish Smart builds upon the San Francisco Bay Fish Project (sfei.org/sfbfp#sthash.eOcfwrhA.dpbs), a risk reduction framework developed regionally in the previous permit term. The Fish Project funded Bay Area community-based organizations to develop and deliver appropriate communications to appropriately targeted individuals and communities about how to reduce their exposure to mercury and PCBs from consuming San Francisco Bay fish.

During FY 2021/22, EHS continued to conduct a variety of activities that target at-risk populations (e.g., subsistence fisherman) via the Fish Smart program. Table 11-1 summarizes accomplishments of the Fish Smart program from FY 2015/16 through FY 2021/22. Various quantitative measures of outreach and outcomes are underlined (e.g., numbers of brochures distributed, numbers of people interacted with at outreach events, numbers of people receiving electronic newsletters, and social media postings impressions and reach). The summary illustrates the Fish Smart program’s success over the past several years in providing outreach about potential health impacts of consuming certain types of fish caught in San Francisco Bay. It is likely these efforts have led to reduced health risks in those people and communities most likely to consume San Francisco Bay-caught fish, such as subsistence fishers and their families.

Table 11-1. Summary of Fish Smart program accomplishments

Fiscal Year	Summary of Accomplishments
2015/16	<p>During FY 2015/16, EHS conducted the following activities that target at-risk populations (e.g., subsistence fisherman) via its Fish Smart program:</p> <ul style="list-style-type: none"> ▪ Maintained signs that were previously posted by EHS along the Bay’s shore (e.g., at fishing piers) in most cities in San Mateo County. ▪ Continued to distribute educational materials (i.e., a Fish Project brochure entitled “Guide to Eating Fish and Shellfish from San Francisco Bay”) at targeted locations: <ul style="list-style-type: none"> • EHS provided <u>100 brochures</u> to the San Mateo Medical Center (a county health services clinic). • EHS provided <u>50 brochures</u> to Save Our Shores, a non-profit that works with boaters. • EHS displayed an example sign and provided brochures at the County Fair and interacted there with about <u>300 persons</u> regarding Fish Smart and other EHS programs. ▪ Conducted a “train the trainer” effort by presenting risk reduction information to nurses with the San Mateo County Health System, including nurses who serve appropriate communities. ▪ Presented risk reduction information and handed out brochures at code enforcement and food inspection team meetings. ▪ Posted an entry dated June 7, 2016 about Fish Smart on the EHS blog which has been viewed <u>20 times</u> based on a web page analytic report.

Fiscal Year	Summary of Accomplishments
2016/17	<p>During FY 2016/17, EHS conducted the following activities that target at-risk populations (e.g., subsistence fisherman) via its Fish Smart program:</p> <ul style="list-style-type: none"> ▪ Maintained signs that were previously posted by EHS at 12 locations along the Bay’s shore (e.g., at fishing piers) in the Cities of Brisbane, Burlingame, Redwood City, San Mateo, and South San Francisco. ▪ Provided new signs to the North Fair Oaks Community Center, Docktown Marina, and 9 fishing supply stores ▪ Continued to distribute educational materials (i.e., a Fish Project brochure entitled “Guide to Eating Fish and Shellfish from San Francisco Bay”) at targeted locations: <ul style="list-style-type: none"> • EHS provided <u>50 brochures</u> each to 4 marinas in San Mateo County. • EHS provided <u>50 brochures</u> to Save Our Shores, a non-profit that works with boaters. • EHS attended 6 community health fairs and the San Mateo County Fair, where brochures were provided and where a spinning wheel game was played. <u>Over 1,500 people were reached</u> regarding Fish Smart and other EHS programs. • EHS provided brochures to 11 fishing supply stores in San Mateo County. ▪ Included a Fish Smart article in the Pollution Prevention Post Newsletter which was distributed to <u>over 5,000 people electronically, and 800 people via hard copy.</u> ▪ Presented the Fish Smart program to 14 San Mateo County employees from various departments. ▪ Posted an entry dated March 28th, 2017 about Fish Smart on the EHS blog which has been viewed 17 times based on a web page analytic report. ▪ Posted 3 social media posts on the program <u>totaling 16,517 impressions combined.</u> ▪ Maintained the smchealth.org/fishsmart webpage which <u>received 538 views</u> over a 10-month period <p><u>Cumulatively, EHS had over 23,000 electronic or in person Fish Smart program impressions for FY 2016-17.</u></p>
2017/18	<p>During FY 2017/18, EHS conducted the following activities that target at-risk populations (e.g., subsistence fisherman) via its Fish Smart program:</p> <ul style="list-style-type: none"> ▪ Maintained signs that were previously posted by EHS at 11 locations along the Bay’s shore (e.g., at fishing piers) in the Cities of Brisbane, Burlingame, Redwood City, San Mateo, and South San Francisco. ▪ Printed Fish Project brochure “Guide to Eating Fish and Shellfish from San Francisco Bay” in English, Spanish, Chinese, and Tagalog. ▪ Continued to distribute educational materials (i.e., a Fish Project brochure entitled “Guide to Eating Fish and Shellfish from San Francisco Bay”) at targeted locations: <ul style="list-style-type: none"> • EHS provided <u>50 brochures</u> each to 4 marinas in San Mateo County. • EHS attended 17 community health fairs, events, and the San Mateo County Fair, where brochures were provided and where a spinning wheel game was played. <u>Over 4,000 people were reached</u> regarding Fish Smart and other EHS programs. • EHS created a Fish Smart fishing game where children catch fish with a fishing pole and identify if the fish is safe or not safe to each in exchange for a prize. ▪ Presented the Fish Smart program to 30 San Mateo County Family Health Division Women, Infant, and Children (WIC) employees and provided brochures to them to distribute to their clients. ▪ Posted 4 social media posts on the program <u>totaling 4,114 impressions combined.</u>

Fiscal Year	Summary of Accomplishments
	<ul style="list-style-type: none"> ▪ Maintained the smchealth.org/fishsmart webpage which received 3,800 views over a 11-month period. <p><u>Cumulatively, EHS had nearly 12,000 electronic or in person Fish Smart program impressions for FY 2017/18.</u></p>
2018/19	<p>During FY 2018/19, EHS conducted the following activities that target at-risk populations (e.g., subsistence fisherman) via its Fish Smart program:</p> <ul style="list-style-type: none"> ▪ EHS staff maintained signs posted along the San Francisco Bay shore (e.g., at fishing piers) in the Cities of Brisbane, South San Francisco, San Mateo, Burlingame, and Redwood City. In addition, two new Fish Smart in San Francisco Bay signs were installed at locations where fishing has been observed. ▪ The Office of Environmental Health Hazard Assessment (OEHHA) updated its statewide advisory for the California Coast in FY 2018/19. EHS provided signs in English, Spanish, Tagalog, and Chinese to City of Pacifica staff to post at the Pacifica Pier and printed the advisories in four languages to distribute in flyer format. ▪ EHS staff <u>spoke with 2,500 residents at 10 events</u> where information on the Fish Smart in San Francisco Bay, California Coast, and Monterey Bay Aquarium’s Seafood Watch Programs was provided. ▪ Maintained the smchealth.org/fishsmart webpage which <u>received over 2,700 views</u>. ▪ EHS created <u>10 social media posts</u> about safe fish consumption guidelines for the Bay and Ocean. <u>Posts combined totaled over 110,000 impressions</u> (number of times a post was on-screen), and <u>over 9,800 engagements</u> (e.g., a link in the post was clicked on). ▪ One social media post about surfperch <u>reached over 16,000 people and had over 500 shares</u>.
2019/20	<p>During FY 2019/20, EHS conducted the following activities that target at-risk populations (e.g., subsistence fisherman) via its Fish Smart program:</p> <ul style="list-style-type: none"> ▪ EHS staff maintained signs posted along the San Francisco Bay shore (e.g., at fishing piers) in the Cities of Brisbane, South San Francisco, San Mateo, Burlingame, and Redwood City. One sign was replaced at the Brisbane Lagoon due to the previous sign and pole being knocked down. ▪ EHS continued to promote the Fish Smart program using the California OEHHA fish consumption advisories in various languages through flyer distribution at community events, bait and tackle stores, harbormaster offices, and WIC community offices. <u>1,075 flyers in various languages were distributed at 20 locations within the County</u>. ▪ EHS staff <u>spoke with 1,128 residents at 4 events</u> where information on the Fish Smart in San Francisco Bay, California Coast, and Monterey Bay Aquarium’s Seafood Watch Programs was provided. ▪ Maintained the smchealth.org/fishsmart webpage which <u>received 4,212 views</u>. ▪ EHS created three social media posts and shared them on both Facebook and Twitter for a total of six posts. One of the posts was also <u>shared to over 124,000 households countywide on Nextdoor.com</u>. <u>Posts combined had a reach or impression total of 16,961</u>, depending on the platform. <u>Combined, the posts had 1,250 engagements</u>. ▪ On February 13th, 2020, 13 surveys were conducted at the Pacifica Pier to discuss the OEHHA fish consumption guidelines. Results showed that 92% of respondents eat the fish they caught and shared at least some types of the fish they caught with their friends or family. <u>When asked if they knew that certain fish were not safe to eat due to high mercury and PCB levels, 84% indicated they were aware of this</u>.
2020/21	<p>During FY 2020/21, EHS conducted the following activities that target at-risk populations (e.g., subsistence fisherman) via its Fish Smart program:</p> <ul style="list-style-type: none"> ▪ Completed annual sign audits and updated and maintained tracking sheet and Google sign location map.

Fiscal Year	Summary of Accomplishments
	<ul style="list-style-type: none"> ▪ Scouted and reached out to potential new posting locations. ▪ Added links to the smchealth.org/fishsmart website for Spanish, Chinese, and Tagalog Coast & Bay safe-to-eat fish guides (PDF format). ▪ Provided <u>nine new OEHHA coast signs</u> to State Parks to put up along the coast. ▪ Provided <u>one new OEHHA coast sign</u> for Pillar Point Harbor's new fishing pier. ▪ Communicated with OEHHA on obtaining Google analytic page views from the Bay Area and discussed salmon on the protected species list concern. ▪ Communicated with Alameda County's Fish Smart Program lead to obtain ideas for FY 2021/22. ▪ <u>Called, mailed, or visited 15 partner locations</u> to discuss Fish Smart Program promotion and <u>provided 1150 flyers</u> in English, Spanish, Tagalog and Chinese. ▪ Sent out a Constant Contact email that linked to an upcoming Monterey Bay Aquarium Seafood Watch webinar as well as the OEHHA bay and coast guidelines PDF. <u>Results: sent to 103 residents with an open rate of 44% (compared to industry average of 28%).</u> ▪ Worked with our contractor SGA to create Google ads that aired in March 2021 in English & Spanish that <u>received a total of 455,724 impressions and 3,676 clicks to the website.</u> ▪ As of 6/01/2021, smchealth.org/fishsmart had <u>2,763 page visits</u> of which <u>1,848 were new visitors.</u>
2021/22	<p>During FY 2021/22, EHS conducted the following activities that target at-risk populations (e.g., subsistence fisherman) via its Fish Smart program:</p> <ul style="list-style-type: none"> ▪ Completed annual sign audits and updated and maintained tracking sheet and Google sign location map. ▪ Added links to the smchealth.org/fishsmart website for Vietnamese Coast & Bay safe-to-eat fish guides (PDF format). ▪ <u>Visited 29 partner locations</u> to discuss Fish Smart Program promotion and <u>provided 2,250 flyers</u> in English, Spanish, Tagalog, Vietnamese and Chinese. ▪ Worked with our contractor SGA to create Google ads that aired between April and June 2022 in English that <u>received a total of 1,082,569 impressions and 11,787 clicks to the website.</u> ▪ As of 6/15/2022, smchealth.org/fishsmart had <u>12,153 page visits</u> of which <u>10,523 were new visitors.</u> ▪ Began Fish and Shellfish Advisory Signage Grant application process through State Water Resources Control Board (SWRCB) and California Conference of Directors of Environmental Health (CCDEH) to obtain funding to create new signage at SMC Fish Smart locations.

FUTURE ACTIONS

SMCWPPP activities that are planned for FY 2022/23 to assist San Mateo County municipalities comply with requirements in Provisions C.11/12 of the reissued regional municipal stormwater permit (MRP 3.0) to reduce mercury and PCBs loads in stormwater runoff and report on the load reductions are described in the separate report mentioned earlier (*Updated Control Measures Plan for PCBs and Mercury in San Mateo County Stormwater Runoff, SMCWPPP, September 30, 2021*). Appendix 11 contains the report.

During FY 2022/23, SMCWPPP also plans to continue to assist San Mateo County municipalities comply with the MRP risk reduction program requirements by coordinating with and reporting on the Fish Smart program conducted by EHS:

- EHS will continue to maintain signs and scout new locations to place signs to reach subsistence fishermen. Fish consumption messaging via social media will continue. Discussions with fishermen and their families at local events will continue as well as providing consumption guidelines to marinas and targeted retail and community locations.
- SMCWPPP will continue to work with EHS staff to document the risk reduction program and provide an update in the SMCWPPP FY 2022/23 Annual Report.

SECTION 12

C.12 PCBs CONTROLS

INTRODUCTION

MRP Provision C.12, PCBs Controls, implements stormwater runoff-related actions required by the San Francisco Bay PCB Total Maximum Daily Load (TMDL) water quality restoration program. SMCWPPP performs a variety of activities to address PCBs in stormwater runoff in compliance with MRP Provision C.12. Many of these activities address mercury in addition to PCBs and are described in the previous chapter (Section 11, Mercury Controls) rather than this section.

IMPLEMENTATION OF MRP PROVISIONS

C.11/12.a. Implement Control Measures to Achieve Mercury/PCBs Load Reductions

Efforts by SMCWPPP and San Mateo County municipalities to address MRP Provisions C.11/12.a., Implement Control Measures to Achieve Mercury/PCBs Load Reductions, are described in a separate report (*Updated Control Measures Plan for Mercury and PCBs in San Mateo County Stormwater Runoff, SMCWPPP, September 30, 2022*) that is presented in Appendix 11.

C.11/12.b. Assess Mercury/PCBs Load Reductions from Stormwater

For a description of efforts by SMCWPPP and San Mateo County municipalities to address MRP Provisions C.11/12.b., Assess PCBs Load Reductions from Stormwater, please see Section 11 (C.11 Mercury Controls) and the separate report mentioned previously (*Updated Control Measures Plan for PCBs and Mercury in San Mateo County Stormwater Runoff, SMCWPPP, September 30, 2022*). Appendix 11 contains the report.

It is important to note that per the documentation in SMCWPPP's FY 2019/20 Annual Report, the estimated PCBs load reduction across the permit area over the time period of FY 2013/14 through FY 2019/20 was 3,017 g/yr, indicating that the MRP regional performance criterion of 3,000 g/yr of PCBs load reduced by July 2020 was achieved.¹

C.11/12.c. Plan and Implement Green Infrastructure to Reduce Mercury/PCBs Loads

Permittees were required to submit in their FY 2019/20 Annual Report an estimate of the amount and characteristics of land area that will be treated through green infrastructure implementation by 2020,

¹It is important to note that the MRP allows Permittees to meet the regional criterion as a group – criteria for individual counties would only apply when the regional group criterion was not met.

2030, and 2040, including all data used and a full description of models and model inputs relied on to generate this estimate.

Permittees were also required to submit in their FY 2019/20 Annual Report a Reasonable Assurance Analysis (RAA) to demonstrate quantitatively that PCBs reductions of at least 3 kg/yr will be realized by 2040 through implementation of green infrastructure projects. The MRP requires this submittal to include all data used and a full description of models and model inputs relied on to make the demonstration and documentation of peer review of the RAA.

San Mateo County Permittees fulfilled the above MRP requirements via development of a separate report that was submitted with SMCWPPP's FY 2019/20 Annual Report (*Pollutant Control Measures Implementation Plan and Reasonable Assurance Analysis for San Mateo County, California, Scenarios to Achieve PCBs and Mercury San Francisco Bay TMDL Wasteload Allocations, September 30, 2020*).

C.11/12.d. Prepare Implementation Plan and Schedule to Achieve TMDL Wasteload Allocations

As described in more detail in Section 11 (C.11 Mercury Controls), MRP Provisions C.11/12.d. require that Permittees prepare a plan and schedule for mercury and PCBs control measure implementation and a corresponding RAA demonstrating quantitatively that sufficient control measures will be implemented to attain the mercury and PCBs TMDL wasteload allocations by 2028 and 2030, respectively. San Mateo County Permittees fulfilled this requirement via development of a separate report that was submitted with SMCWPPP's FY 2019/20 Annual Report (*Pollutant Control Measures Implementation Plan and Reasonable Assurance Analysis for San Mateo County, California, Scenarios to Achieve PCBs and Mercury San Francisco Bay TMDL Wasteload Allocations, September 30, 2020*).

C.12.e. Evaluate PCBs Presence in Caulks/Sealants Used in Storm Drain or Roadway Infrastructure in Public Rights-of-Way

MRP 2.0 Provision C.12.e. requires that Permittees collect samples of caulk and other sealants used in storm drains and between concrete curbs and street pavement and investigate whether PCBs are present in such material and in what concentrations. BASMAA has completed a regional investigation that addresses this requirement. SMCWPPP reported on the results of the investigation in its FY 2017/18 Annual Report.

C.12.f. Manage PCB-Containing Materials and Wastes during Building Demolition Activities So That PCBs Do Not Enter Municipal Storm Drains

MRP Provision C.12.f. requires that Permittees develop and implement or cause to be developed and implemented an effective protocol for managing materials with PCBs concentrations of 50 parts per million or greater in applicable structures² at the time such structures undergo demolition, so that PCBs do not enter municipal storm drain systems. A Permittee is exempt from this requirement if it provided evidence acceptable to the Executive Officer in its FY 2016/17 Annual Report that the only buildings that existed pre-1980 within its jurisdiction were single-family residential and/or wood-frame buildings.³

² Applicable structures are buildings built or remodeled from January 1, 1950 through December 31, 1980, with the following exemptions: single-family residential buildings, wood-framed buildings, and partial building demolitions.

³The City of Clayton in Contra Costa County provided acceptable evidence and is exempt from this provision.

Permittees were required to develop a protocol by June 30, 2019 that includes each of the following components, at a minimum:

- The necessary authority to ensure that PCBs do not enter municipal storm drains from PCBs-containing materials in applicable structures at the time such structures undergo demolition;
- A method for identifying applicable structures prior to their demolition; and,
- Method(s) for ensuring PCBs are not discharged to the municipal storm drain from demolition of applicable structures.

By July 1, 2019 and thereafter, Permittees are required to:

- Implement or cause to be implemented the PCBs management protocol for ensuring PCBs are not discharged to municipal storm drains from demolition of applicable structures via vehicle track-out, airborne releases, soil erosion, or stormwater runoff; and,
- Develop an assessment methodology and data collection program to quantify in a technically sound manner PCBs loads reduced through implementation of the protocol for controlling PCBs during demolition of applicable structures.

On behalf of MRP Permittees, BASMAA conducted a multi-year regional project to assist MRP Permittees to address Provision C.12.f. The BASMAA project, which began in FY 2016/17 and was completed in March 2019, assisted Permittees in developing local programs to manage PCBs-containing materials during building demolition. It developed guidance materials, tools and training materials and conducted outreach. SMCWPPP actively participated in the project, including providing BASMAA's project manager.

At the outset of the project, a BASMAA Steering Committee was convened to provide project oversight and guidance during the project. The Steering Committee included BASMAA Directors, countywide stormwater program staff, and Permittee staff from various relevant municipal departments. The Steering Committee met periodically throughout the project. In addition, a project TAG, a small balanced advisory group formed from industry, regulatory, and Permittee representatives to provide review and input on selected project work products, was convened. The TAG was comprised of representatives from industry and state/federal regulatory agencies, and Permittees. Other efforts to engage key stakeholders included an industry stakeholder roundtable meeting (August 2017) and two larger stakeholder group meetings (December 2017 and May 2018) that included industry, regulatory and municipal representatives. During FY 2018/19, Permittees tailored the BASMAA products for local use, adopted the program (e.g., via local policy or ordinance), and trained local staff to implement the new program starting July 1, 2019.

Key BASMAA project deliverables provided to each Permittee to use as appropriate given local procedures and needs included:

- A protocol for pre-demolition building survey for priority PCBs-containing building materials;
- Model language for municipal adoption (e.g., ordinance) of the new program to manage PCBs materials during building demolition and model supporting staff report and resolution;
- CEQA strategy and model notice of exemption;

- Supplemental demolition permit model application materials, including forms, process flow charts, and applicant instructions; and
- An analysis to assist municipalities that pursue cost recovery.

Other project deliverables included:

- A coordination/communication strategy for the project;
- A technical memorandum summarizing any new information & decisions needed by BASMAA at outset, including an annotated table of regulatory drivers and relevant requirements;
- A technical memorandum with the state of the practice for identifying PCBs-containing building materials (developed to inform development of the pre-demolition building survey protocol listed below);
- Industry stakeholder outreach materials and a fact sheet for municipal staff;
- A spreadsheet tool used to develop the prioritized list of potential PCBs-containing building materials that the demolition program will focus on;
- A conceptual approach for an assessment methodology and data collection program to quantify PCBs loads reduced through managing PCBs-containing materials during building demolition.

During FY 2018/19, the BASMAA project concluded by conducting the following outreach and training tasks:

- Prepared training materials for municipal staff on adoption and implementation of the new program;
- Developed outreach materials and a standard presentation to inform industry stakeholders including developers, planning firms, urban planning non-governmental organizations, demolition firms, property owners, property managers, and realtors about the new program to manage PCBs in building materials during demolition;
- Using the above training materials, conducted training workshops (in-person and a webinar) for key municipal and countywide stormwater program staff;
- Conducted a webinar for industry stakeholders; and
- Developed a list of Bay Area opportunities, including contact information and dates, for municipal and/or stormwater program staff to conduct additional outreach to industry stakeholders using the above industry outreach materials.

In addition, during FY 2018/19 and FY 2019/20, San Mateo County and other MRP Permittees worked together through the BASMAA Monitoring and Pollutants of Concern Committee (MPC) to develop a framework to comply with data collection/evaluation and reporting requirements under Provision C.12.f. As mentioned previously, these requirements include developing an assessment methodology and data collection program to quantify PCBs loads reduced through implementation of the new program. The regional process developed includes the following steps:

1. The municipality informs demolition permit applicants that their projects are subject to the MRP Provision C.12.f requirements, necessitating, at a minimum, an initial screening for priority PCBs-containing materials.

2. For every demolition project, applicants complete and submit a version of BASMAA's model "PCBs Screening Assessment Form" (Screening Form) or equivalent to the municipality.
3. The municipality reviews the Screening Form to make sure it is filled out correctly and is complete and works with the applicant to correct any deficiencies.
4. The municipality then issues the demolition permit or equivalent, according to its procedures.⁴
5. For Applicable Structures only, the municipality submits completed Screening Forms and any supporting documents (consultant's report from PCBs building survey, QA/QC checklist, and lab reports) to its countywide program; forms for exempt sites need not be submitted. Forms should be submitted to the countywide programs electronically if feasible, and at a minimum annually, but quarterly is preferred.
6. The countywide programs compile the completed Screening Forms and any supporting documents. The countywide program then works with the other MRP countywide programs through BASMAA to manage and evaluate the data, and to assist Permittees with associated MRP reporting requirements.

All San Mateo County Permittees began implementing the program on or before July 1, 2019. Appendix 12 includes a memorandum prepared by SMCWPPP in compliance with MRP reporting requirements in Provision C.12.f. iii(4). The memorandum provides documentation of (a) the number of applicable structures that applied for a demolition permit during the reporting year, and (b) a running list of the applicable structures that applied for a demolition permit (since the date the PCBs control protocol was implemented) that had material(s) with PCBs at 50 ppm or greater, with the address, demolition date, and brief description of PCBs control method(s) used (*Program for Management of PCBs during Building Demolition – Data Summary through FY 2021/22 for San Mateo County MRP Permittees*).

C.12.g. Fate and Transport Study of PCBs: Urban Runoff Impact on San Francisco Bay Margins

MRP Provision C.12.g. requires Permittees to conduct or cause to be conducted studies concerning the fate, transport, and biological uptake of PCBs discharged from urban runoff to San Francisco Bay margin areas. This requirement is being addressed through a multi-year project by the San Francisco Bay Regional Monitoring Program (RMP) to develop a series of conceptual models of PCBs in Priority Margin Units (PMUs). SMCWPPP's FY 2016/17 Annual Report included a workplan developed by BASMAA that describes how these information needs will be accomplished, including the studies to be performed and a preliminary schedule. SMCWPPP's March 30, 2020 Integrated Monitoring Report includes a summary of the findings and results of the studies completed, planned, or in progress and the implications of the studies on potential control measures to be investigated, piloted, or implemented in future permit cycles.

⁴ Municipalities should require that applicants fill out and certify a Screening Form for every demolition. For non-Applicable Structures, applicants simply check the boxes, certify, and submit to municipality. Then the municipality can authorize the demolition (e.g., issue a demolition permit). In general, municipalities should have a completed and certified Screening Form before authorizing a demolition, unless they are a small community that is exempt or has some other arrangement with Regional Water Board staff. Municipalities do not need to track non-Applicable Structures otherwise.

C.12.h. Risk Reduction Program

SMCWPPP is assisting San Mateo County municipalities to comply with the risk reduction program requirements by coordinating with and reporting on the Fish Smart program conducted by San Mateo County Environmental Health Services (EHS). Please see Section 11 for additional details.

FUTURE ACTIONS

SMCWPPP activities that are planned for FY 2022/23 to assist San Mateo County municipalities comply with requirements in Provisions C.11/12 of the reissued regional municipal stormwater permit (MRP 3.0) to reduce mercury and PCBs loads in stormwater runoff and report on the load reductions are described in the separate report mentioned earlier (*Updated Control Measures Plan for PCBs and Mercury in San Mateo County Stormwater Runoff, SMCWPPP, September 30, 2022*). Appendix 11 contains the report.

During FY 2022/23, SMCWPPP also plans to:

- Continue to participate in the RMP PCBs Work Group to help oversee RMP studies concerning the fate, transport, and biological uptake of PCBs discharged from urban runoff to San Francisco Bay margin areas. A continued focus will be the conceptual model for Steinberger Slough in San Mateo County and associated monitoring fieldwork by the RMP.
- Assist San Mateo County municipalities to implement their programs to manage PCBs during building demolition and compile, evaluate and report the new data generated by the programs.
- Assist San Mateo County municipalities to comply with the risk reduction program requirements by coordinating with and reporting on the Fish Smart program conducted by EHS (see Section 11).

SECTION 13

C.13 COPPER CONTROLS

INTRODUCTION

Provision C.13 of the MRP addresses copper control measures identified in the San Francisco Bay Basin Water Quality Control Plan (commonly referred to as the Basin Plan). The Regional Water Board has deemed these controls are necessary to support copper site-specific objectives in San Francisco Bay. C.13 includes the following sub-provisions:

- C.13.a. Manage waste generated from cleaning and treating copper architectural features, including copper roofs, during construction and post-construction;
- C.13.b. Manage discharges from pools, spas and fountains that contain copper-based chemicals; and
- C.13.c. Industrial Sources.

In FY 2021/22, Permittees and the Countywide Program continued to conduct activities related to complying with Provision C.13. Local copper control actions are documented in each Permittee's individual Annual Report. This section summarizes related activities conducted by the Countywide Program.

IMPLEMENTATION OF MRP PROVISIONS

C.13.a. Copper Architectural Features

Provision C.13.a. requires Permittees to manage waste from cleaning and treating copper architectural features, including copper roofs, during construction and post-construction.

During FY 2021/22, SMCWPPP continued to train municipal staff on the MRP requirements and BMPs for architectural copper installation, cleaning, and treating. The trainings utilized a SMCWPPP factsheet entitled "Requirements for Architectural Copper: Protect water quality during installation, cleaning, treating, and washing!" which targets suppliers and installers of copper materials and is available on the SMCWPPP website (flowstobay.org). Municipal construction site stormwater inspectors received the information from a presentation at the SMCWPPP Construction Site Stormwater Inspections Training on March 20, 2022 (see Section 6 for more details).

C.13.b. Manage Discharges from Pools, Spas and Fountains

Provision C.13.b. requires Permittees to manage discharges from pools, spas and fountains that contain copper-based chemicals by adopting local ordinances. These requirements are implemented by individual Permittees and are reported on in their Annual Reports. Guidance on these requirements for illicit discharge inspectors is provided through SMCWPPP's CII Subcommittee and public outreach on related

BMPs is provided through SMCWPPP's PIP Subcommittee. A fact sheet entitled *Best Management Practices for Pools, Hot Tubs, and Fountain Water Discharges* was developed in FY 2018/19 and includes information on avoiding the use of copper-based algaecides. The [fact sheet](#) is available on the SMCWPPP website (flowstobay.org). Section 15 discusses related public outreach by SMCWPPP to promote pool, spa, and fountain discharge BMPs through social media posts.

C.13.c. Industrial Sources

Provision C.13.c. requires Permittees to ensure through routine industrial facility inspections that proper BMPs are in place at industrial facilities likely to use copper or have sources of copper. SMCWPPP's CII Subcommittee assists San Mateo County municipal agency staff with understanding this MRP requirement and SMCWPPP develops MRP compliance support materials, as necessary. In addition, in June 2010 BASMAA developed pollutants of concern commercial/industrial inspector training materials and a guidance manual that address industrial sources of copper. These materials are available on SMCWPPP's members only website. Industrial inspectors also receive information on this topic in a guidance document prepared by SMCWPPP entitled *Stormwater Inspector Guidance on Meeting Annual MRP C.4.d Training Requirements* (June 1, 2019).

FUTURE ACTIONS

FY 2022/23 activities planned by SMCWPPP to assist San Mateo County Permittees comply with MRP requirements in Provision C.13 of the reissued regional municipal stormwater permit (MRP 3.0) include the following:

- Continue to provide information on MRP requirements regarding architectural sources of copper to construction site and building inspectors at New Development Subcommittee meetings, SMCWPPP's FY 2022/23 Construction Site Inspector Workshop, and at presentations to CALBIG or other partner organizations;
- Provide guidance to San Mateo County Permittees via SMCWPPP's CII Subcommittee and/or SMCWPPP stormwater business inspector training workshops and materials to assist them with conducting routine industrial facility inspections that ensure proper BMPs are in place at industrial facilities likely to use copper or have sources of copper; and
- Continue to provide outreach material and guidance via SMCWPPP's CII and PIP Subcommittees regarding pool, spa, and fountain discharge BMPs.



SECTION 15

C.15 EXEMPTED AND CONDITIONALLY EXEMPTED DISCHARGES

INTRODUCTION

The objective of MRP Provision C.15, Exempted and Conditionally Exempted Discharges, is to exempt unpolluted non-stormwater discharges from the MRP's general non-stormwater discharge prohibition (Provision A.1) and to conditionally exempt non-stormwater discharges that are potential sources of pollutants. This section describes SMCWPPP's countywide activities conducted to help its member agencies implement this provision. SMCWPPP helps municipal staff understand the MRP's requirements and makes various MRP compliance support materials available for their use. The SMCWPPP CII Subcommittee, discussed in Section 4, facilitates and coordinates providing this assistance to the member agencies for a variety of different types of non-stormwater discharges that may be conditionally exempted.

In addition, during FY 2021/22 SMCWPPP's PIP component conducted selected activities to help San Mateo County Permittees comply with public outreach requirements in Provision C.15.b.iv. Individual Residential Car Washing Discharge, C.15.b.v. Swimming Pool, Hot Tub, Spa and Fountain Water, and Provision C.15.b.vi. Irrigation Water, Landscape Irrigation, and Lawn or Garden Watering. These activities are described below.

IMPLEMENTATION OF MRP PROVISIONS

Provision C.15.b.iv. Individual Residential Car Washing


During FY 2021/22, SMCWPPP continued previous years' outreach efforts through social media posts to encourage residents to use professional car wash companies rather than washing their cars at home (Figure 15-1). The practice of using commercial car washes helps keep soaps, automotive pollutants, and environmental toxins from washing into San Mateo County storm drains. Through social media posts, residents were directed to learn more about why they should choose car wash companies and best practices to use at home if they need to wash at home. The SMCWPPP webpage shown in Figure 15-2 received 364 pageviews.



San Mateo Countywide Water Pollution Prevention Program

Flows To Bay is in San Mateo County.
Published by Social Marketing · May 21 ·

Time to wash your car? Consider taking it to a car wash and letting the professionals do all the handy work for you instead. Professional car washes have the tools necessary to keep contaminated water from landing in sewer systems. Still prefer to do it yourself? We have a couple of tips that can reduce the water used and avoid water runoff. Check them out here: <https://bit.ly/Car-Washes>



494 People reached 11 Engagements ↑ +1.0x average Distribution score [Boost post](#)


7 1 Share

Like Comment Share

Comment as Flows To Bay

Flows To Bay is in San Mateo County.
Published by Social Marketing · October 13, 2021 ·

Are you thinking of giving your car a wash? Take it to the pros and help keep harmful chemicals from flowing to our waterways.
Read about commercial car wash benefits here: bit.ly/Car-Washes



296 People reached 6 Engagements ↓ -1.5x lower Distribution score [Boost post](#)


3 1 Share

Like Comment Share

Comment as Flows To Bay

Flows To Bay
Published by Social Marketing · January 22 ·

Car looking a little dirty? Take it to the pros and help keep harmful chemicals from flowing to our waterways. Read about commercial car wash benefits here: <https://bit.ly/Car-Washes>



430 People reached 7 Engagements ↓ -1.1x average Distribution score [Boost post](#)

1 1 Share

Like Comment Share

Comment as Flows To Bay

Figure 15-1. Examples of Facebook posts about car washing



The screenshot shows the 'Automotive Care - Flows to Bay' page on flowstobay.org. The page has a green header with navigation links for 'English', 'Español', '中文', 'Tagalog', 'Events Calendar', 'Contact', 'Blog', and a search bar. Below the header is a secondary navigation menu with links for 'ABOUT FLOWS TO BAY', 'PREVENTING STORMWATER POLLUTION', 'DATA & RESOURCES', 'GET INVOLVED', and 'PERMITTEES'. The main heading is 'Car Washing Tips'. On the left, there is a sidebar with 'ON THIS PAGE' listing various maintenance tips, a 'SEARCH SITE' section with a search input and button, and 'QUICK LINKS' for community events, blog, illegal dumping reports, and newsletters. The main content area features a photograph of a car being washed in an automatic car wash. Below the photo, a paragraph explains that driveway car washing creates runoff that goes into storm drains, picking up pollutants and using a lot of water. Two bullet points provide best practices: 'Leave it to the pros' (commercial washers are more efficient) and 'Get on the grass' (DIY washing on permeable surfaces allows absorption and filtering). A small green arrow icon is visible at the bottom right of the text area.

Figure 15-2. Automotive maintenance webpage

Provision C.15.b.v. Swimming Pool, Hot Tub, Spa, and Fountain Water Discharges

During FY 2021/22, SMCWPPP continued public outreach and educational efforts to encourage implementation of appropriate BMPs in commercial, municipal, and residential facilities. SMCWPPP shared with member agencies BMP fact sheets that specifically target swimming pools, hot tubs, spas, and fountain water discharges (Figure 15-3) and promoted best practices through social media posts (Figure 15-4).



San Mateo Countywide Water Pollution Prevention Program



BEST MANAGEMENT PRACTICES FOR SWIMMING POOLS, HOT TUBS & FOUNTAIN WATER DISCHARGES
Homeowners | Landscapers | Swimming Pool/Spa Service Workers | Contractors

Information about using Best Management Practices (BMPs) to prevent swimming pool, hot tub, and fountain waters from entering storm drain systems and polluting local waterways.

WHY SHOULD WE BE CONCERNED WITH POOL, HOT TUBS, AND FOUNTAIN WATER DISPOSAL?
Water from pools, hot tubs, and fountains is NOT just water. It also may potential pollutant sources such as chlorine, copper, algaeicides, colored dye, chemicals/salts that are harmful to our creeks and waterways. You may never drain your pool water in the street or storm drain system, even if the water is dechlorinated.

Federal, State, and local regulations prohibit discharge of anything but rain water in the storm drain.

Implementing the proper Best Management Practices (BMPs) is easy and is required for compliance with stormwater pollution prevention regulations.

CLEANING

- Never clean a filter in the street, gutter, or storm drain.
- Rinse cartridge filters onto a dirt area and spade filter residue into the soil.
- Keep backwash discharges out of the street and storm drain. Backwash sand and diatomaceous earth filters onto a dirt area. Dispose of spent filter materials in the trash.
- If you don't have a suitable dirt area, contact your wastewater treatment authority listed on the back of this filter for instructions on discharging to the sanitary sewer.

DRAINING

- Never drain into a street, gutter or storm drain.
- Discharge water to a sanitary sewer clean-out.
- If you are on a septic system or have no sanitary sewer clean-out, contact your wastewater treatment authority listed in this brochure for guidance.

MATERIAL STORAGE & HANDLING

- Store chemicals in a clean, dry and covered area.
- If landscaping materials are left outside, cover with a tarp or plastic sheeting to protect from urban runoff.

A PROPERLY MAINTAINED POOL, HOT TUB, AND FOUNTAIN WILL REDUCE THE NEED FOR DRAINING

MAINTAINING

- Clean regularly, maintain proper chlorine levels and maintain water filtration and circulation.
- Manage pH and water hardness to minimize copper pipe corrosion that can stain your pool and end up in our creeks and the Bay.
- Minimize algae buildup to prevent the need for toxic algaeicides.
- Ask your pool maintenance service for help resolving persistent algae problems without using copper algaeicides.

DID YOU KNOW...?
Copper is a pollutant that threatens aquatic life in our creeks and the Bay. It is used as an algacide in pools, spas and fountains, and copper pipes are commonly used in pool plumbing.

flowstobay.org For More Information About Stormwater Pollution Prevention email info@flowstobay.org
UPDATED APRIL 2019



BEST MANAGEMENT PRACTICES FOR SWIMMING POOLS, HOT TUBS & FOUNTAIN WATER DISCHARGES
Homeowners | Landscapers | Swimming Pool/Spa Service Workers | Contractors

Protect the Bay, the Ocean, and Yourself! Keep swimming pools, hot tub, and fountain water out of storm drains, creeks, and the Bay.

DOING THE JOB RIGHT: CHECKLIST OF BMPs

- Never drain your pool water into the street or storm drain system, even if the water is dechlorinated.
- Always drain your residential pool water into a sewer line. For convenience, use the sewer clean-out connection in your yard.
- You can also access the sewer system drain in your toilet, bathtub or sink inside your home. Be cautious that you do not flood your home if you use this option.
- If you are on a septic system or have no sanitary sewer clean-out, contact your wastewater treatment authority listed in this filter for guidance.
- Filters should be cleaned and rinsed over a dirt area or all rinse water should be captured and filtered to remove any solids prior to being discharged into the sewer system.
- Keep backwash discharges out of the street and storm drain. Backwash sand and diatomaceous earth filters onto a dirt area. Dispose of spent filter materials in the trash.
- Rinse cartridge filters onto a dirt area and spade filter residue into the soil.
- If you don't have a suitable dirt area, contact your wastewater treatment authority listed in this brochure for instructions on discharging to the sanitary sewer.

4 TIPS FOR FINDING YOUR CLEAN-OUT

Sanitary sewer clean-outs are most often found along the sewer line, which is usually aligned with the sewer lines for the house. However, not all cities use the same method to mark their sewer systems. If you have trouble locating your clean-out, contact your local wastewater treatment authority listed in this filter for guidance. See the "Local Pollution Control Agencies" below.

- Look for an "S" stamped into the curb or sidewalk near your house. It marks where the sewer line is. Your clean-out may be along it.
- Look for a slight linear depression in your yard between your house and the street. This is often an indicator of the location of a sewer line, and your clean-out may be on it.
- If your kitchen or bathroom is on an exterior wall, look outside along that wall for the clean-out.
- Stand on the sidewalk looking toward your house. Line up the main water sources in your house (bathrooms, kitchens, washers, etc.) The clean-out is often located on that line, in front of or behind your house.

Wastewater Treatment Plants

Burlingame Waste Water Treatment Facility	(650) 342-3727
Milbrae Water Pollution Control Plant	(650) 259-2388
North San Mateo County Sanitation District	(650) 991-8200
Pacific's Calera Creek Water Recycling Plant	(650) 738-4660
San Mateo Waste Water Treatment Plant	(650) 522-7300
Sewer Authority Mid CoastSide	(650) 736-0124
Silicon Valley Clean Water	(650) 832-0243
South San Francisco/San Bruno Water Quality Control Plant	(650) 877-8555


flowstobay.org The San Mateo Countywide Water Pollution Prevention Program acknowledges the Santa Clara Valley Urban Runoff Pollution Prevention Program for developing and sharing the content this brochure.

Figure 15-3. Swimming pool, hot tub, spa, and fountain water discharge BMP fact sheet

Flows To Bay in San Mateo County
Published by Social Marketing • March 21 •

Do you have plans to drain your swimming pool, hot tub, or fountain? Make sure to discharge the water into a sanitary sewer clean-out and NOT into the street or storm drain. Storm drains flow directly into our local creeks, the Bay, and Pacific Ocean untreated. If there are chemicals from pools, hot tubs, or fountains that enter our storm drain system, they can make our waterways unsafe for recreational contact and fishing—and unsafe for the living creatures who call these waters home.

Learn more here: bit.ly/Pool-Discharge




120 People reached | 1 Engagement | -3.6x lower Distribution score | Boost a post

1 Like | Comment | Share

Comment as Flows To Bay

Flows To Bay
Published by Social Marketing • September 5, 2021 •

If not handled properly, the chemicals you use for swimming pools, spas, hot tubs, and fountains could contaminate our waterways! Be sure to follow these tips and tricks to make sure you're handling those pool chemicals properly: bit.ly/Pool-Discharge




950 People reached | 37 Engagements | +2.0x higher Distribution score | Boost a post

25 Likes | 4 Shares | Comment | Share

Comment as Flows To Bay

Flows To Bay
Published by Social Marketing • August 1, 2021 •

In this hot summer weather, taking a dip in the swimming pool may offer much needed relief! If you do have a swimming pool, it's important to maintain it properly to prevent harmful pool chemicals from contaminating the environment. If you have any questions about the best, most sustainable way to maintain your pool or hot tub, check out our tips at bit.ly/Pool-Discharge



THIS SUMMER...
Help keep pool chemicals out of our waterways by following best maintenance practices!

517 People reached | 16 Engagements | +1.1x average Distribution score | Boost a post

8 Likes | 2 Shares | Comment | Share

Comment as Flows To Bay

Figure 15-4. Examples of Facebook posts about swimming pool, hot tub, spa, and fountain water discharge



Provision C.15.b.vi. Irrigation Water, Landscape Irrigation, and Lawn or Garden Watering

In FY 2021/22, SMCWPPP implemented the following outreach activities to promote the use of less-toxic options for pest control and landscape management, and the use of drought tolerant, native vegetation to minimize landscape irrigation demands:

- Conducted outreach to San Mateo County residents to support and promote eco-friendly alternatives to toxic pesticides (Figures 15-5 and 15-6, Tables 15-1 and 15-2). This promotion took place on social media, during two webinars we conducted, the SMCWPPP newsletter, and blog. Additional messaging was provided through SMCWPPP’s point-of-purchase program, where OWOW materials were distributed that educate residents about eco-friendly pesticide alternatives and six tabling event at local hardware stores.
- Continued to promote water-conservation tips via social media and wrote a blog that feature water conservation (Figure 15-7).
- Promoted planting of drought tolerant, native vegetation through our online media channels, including social media (Figures 15-8 and 15-9, Tables 15-3 and 15-4) and the SMCWPPP newsletter and blog. Messaging focused on the environmental benefits of planting native plants, including their tolerance to drought (Figure 15-10).
- Held a webinar in March titled “Spring Blooming: Eco-Friendly Weed Management” in which our IPM expert (Charlotte with OWOW) presented about IPM strategies for managing weeds. The webinar had 187 registrants and 88 attendees (Figure 15-11).

Table 15-1. Summary of Facebook posts on pesticide pollution prevention topics

Post Focus	Reach	Engagements (likes, comments, and shares)	Clicks
Integrated Pest Management (28 posts)	23,548	260	388
Hiring a Pest Control Operator (6 posts)	5,715	95	94
Links Between Pesticides & Water Quality (8 posts)	4,555	85	29

Table 15-2. Summary of Instagram posts on pesticide pollution prevention topics

Post Focus	Reach	Engagements (likes, comments, shares, and saves)
Integrated Pest Management (40 posts)	6,956	376
Hiring a Pest Control Operator (5 posts)	612	40
Links Between Pesticides & Water Quality (9 posts)	727	53



Flows To Bay is in San Mateo County
 Published by Social Marketing · September 15, 2021

Spraying chemical pesticides can be seriously harmful to bees and other pollinators. It's always best to use less toxic pesticide alternatives, and follow these tips for reducing the impact pesticides have on pollinators.

Visit ipm.ucanr.edu/bee precaution to look up bee precaution pesticide ratings by product. Thanks for this resource UC Master Gardener Program of San Mateo and San Francisco Counties!

Also, you can visit bit.ly/Pesticides-No-Thanks for more information on ... See more

Tips for minimizing harm to pollinators when applying pesticides:

- Use less toxic pesticide alternatives
- Do not apply to flowering plants
- Apply between sunset and midnight

406 People reached 4 Engagements ↓ -1.1x average Distribution score Boost post

3 1 Share

Flows To Bay is in San Mateo County
 Published by Social Marketing · October 26, 2021

Chemical pesticides are not the only way to treat sick plants! A more environmentally friendly approach is to address the underlying issue and prevent the sickness in the first place. One example of this is watering your plants in the early morning rather than evening so they have time to dry out before nighttime. This will help prevent attracting fungal diseases and slugs.

Learn more about Integrated Pest Management here: <https://bit.ly/Pesticides-No-Thanks>

IPM TIP!

Water plants in the early morning so they have time to dry out before nighttime. This will prevent wet soil from attracting slugs and fungal diseases at night.

1,039 People reached 55 Engagements ↑ +2.2x higher Distribution score Boost post

29 1 Comment 11 Shares

IPM Tips

White grubs can damage lawns, and are a tasty treat for raccoons and moles, causing them to tunnel and dig up grass. An application of **beneficial nematodes** in the fall can help get rid of grubs. Avoid fertilizing two weeks before and after application. Irrigate the lawn before applying them and make sure to apply in the early evening.

flowstobay.org @earth.ally

flowstobay
 San Mateo County

flowstobay Here's a new tip from Pest Management Expert @earth.ally on how to deal with grubs in your lawn! Hint: try applying some beneficial nematodes.

#IPM #gardentips #gardening #ecofriendly #grubs #nematodes

Edited · 34w

View insights

Liked by sea_hugger and 8 others

OCTOBER 12, 2021

Add a comment... Post

Figure 15-5. Facebook posts on pesticide pollution prevention topics



Figure 15-6. Instagram posts on pesticide pollution prevention topics

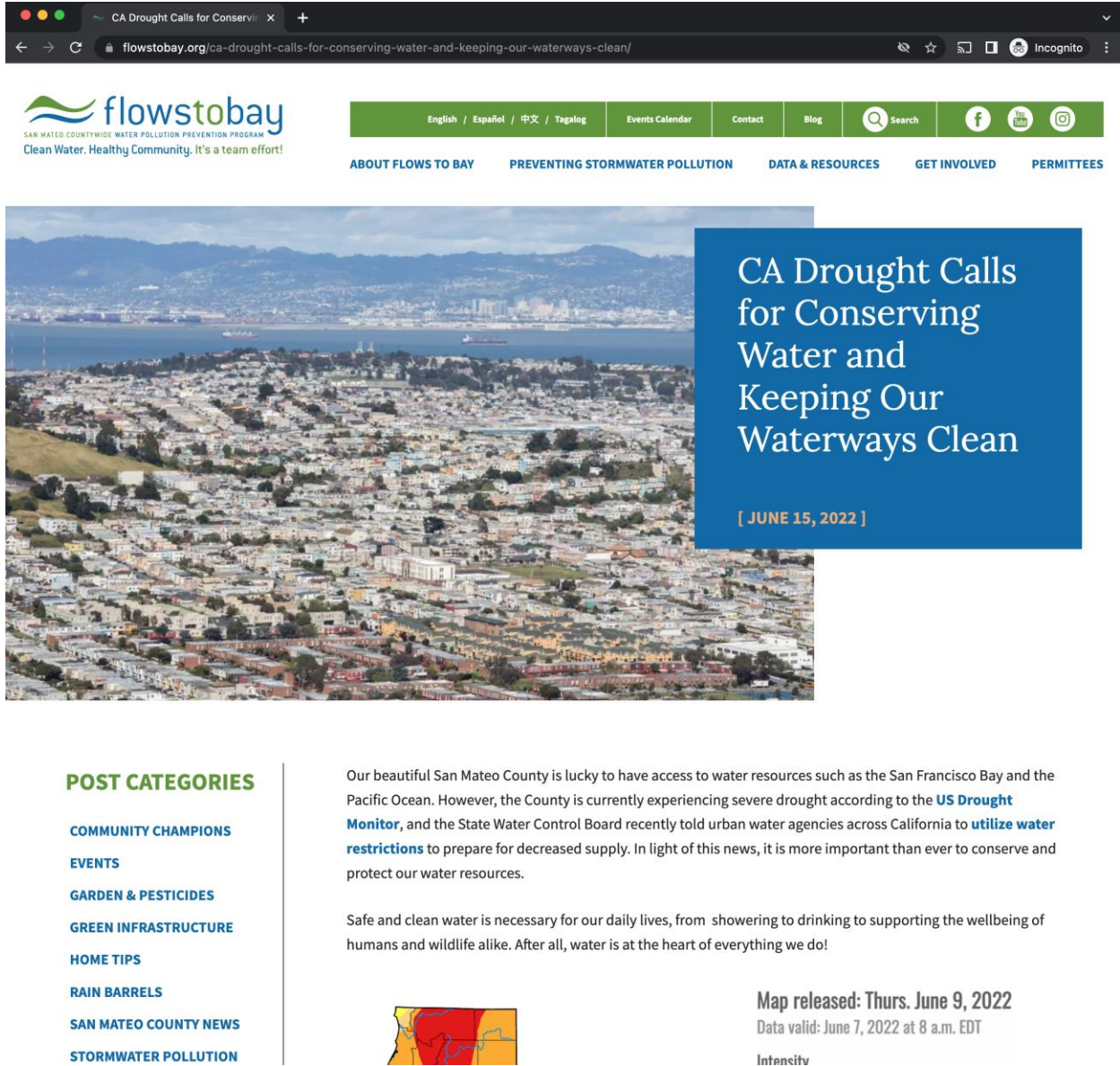


Figure 15-7. Screenshot of blog on SWMPPP’s website that featured water conservation tips

Table 15-3. Summary of Facebook posts promoting landscape management and the use of drought-tolerant, native vegetation

Post Focus	Reach	Engagements (likes, comments, and shares)	Clicks
Drought Tolerant, Native Vegetation (11 posts)	8,630	314	235
Best Practices for Hiring Landscape Professionals (1 post)	681	22	14



Table 15-4. Summary of Instagram posts promoting landscape management and the use of drought-tolerant, native vegetation

Post Focus	Reach	Engagements (likes, comments, shares, and saves)
Drought Tolerant, Native Vegetation (13 posts)	2,003	133
Best Practices for Hiring Landscape Professionals (2 posts)	224	21

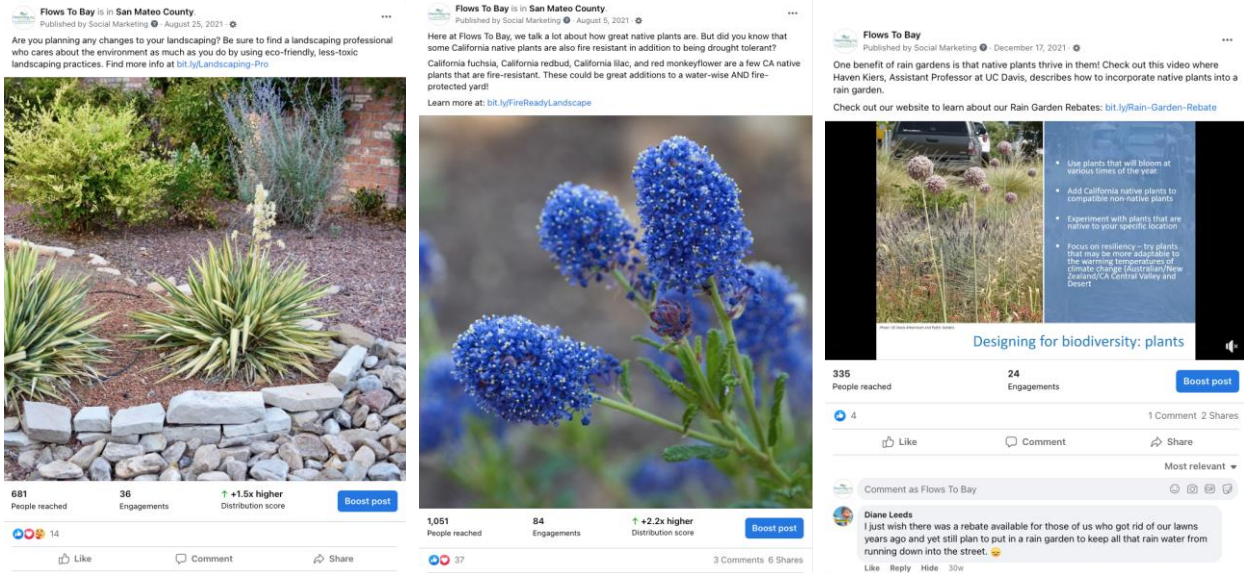


Figure 15-8. Facebook posts promoting landscape management and the use of drought-tolerant, native vegetation

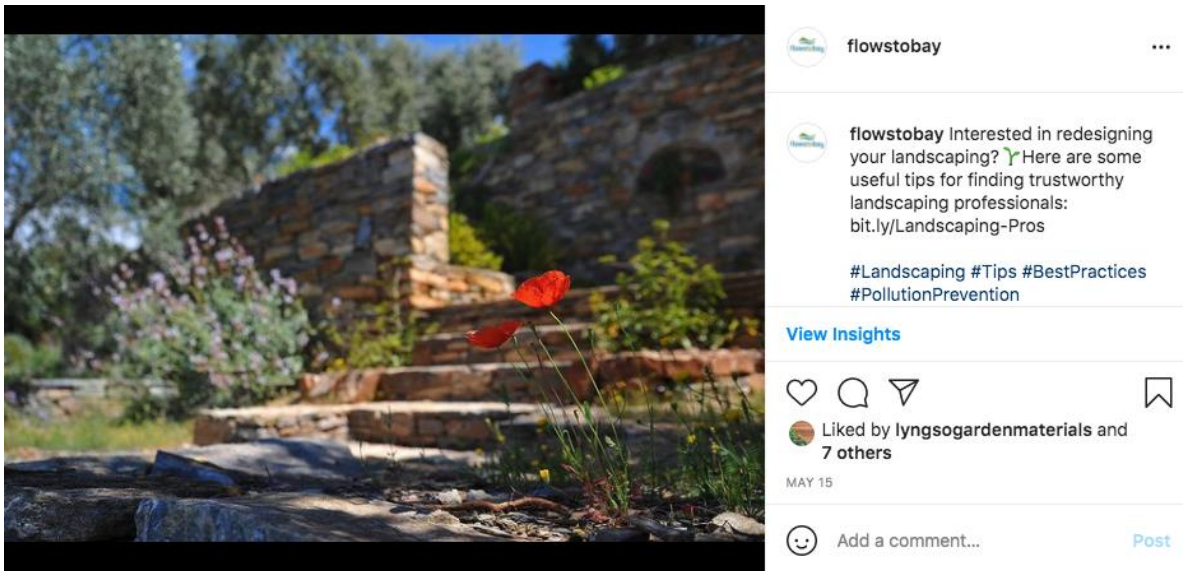


Figure 15-9. Instagram post promoting landscape management and the use of drought-tolerant, native vegetation

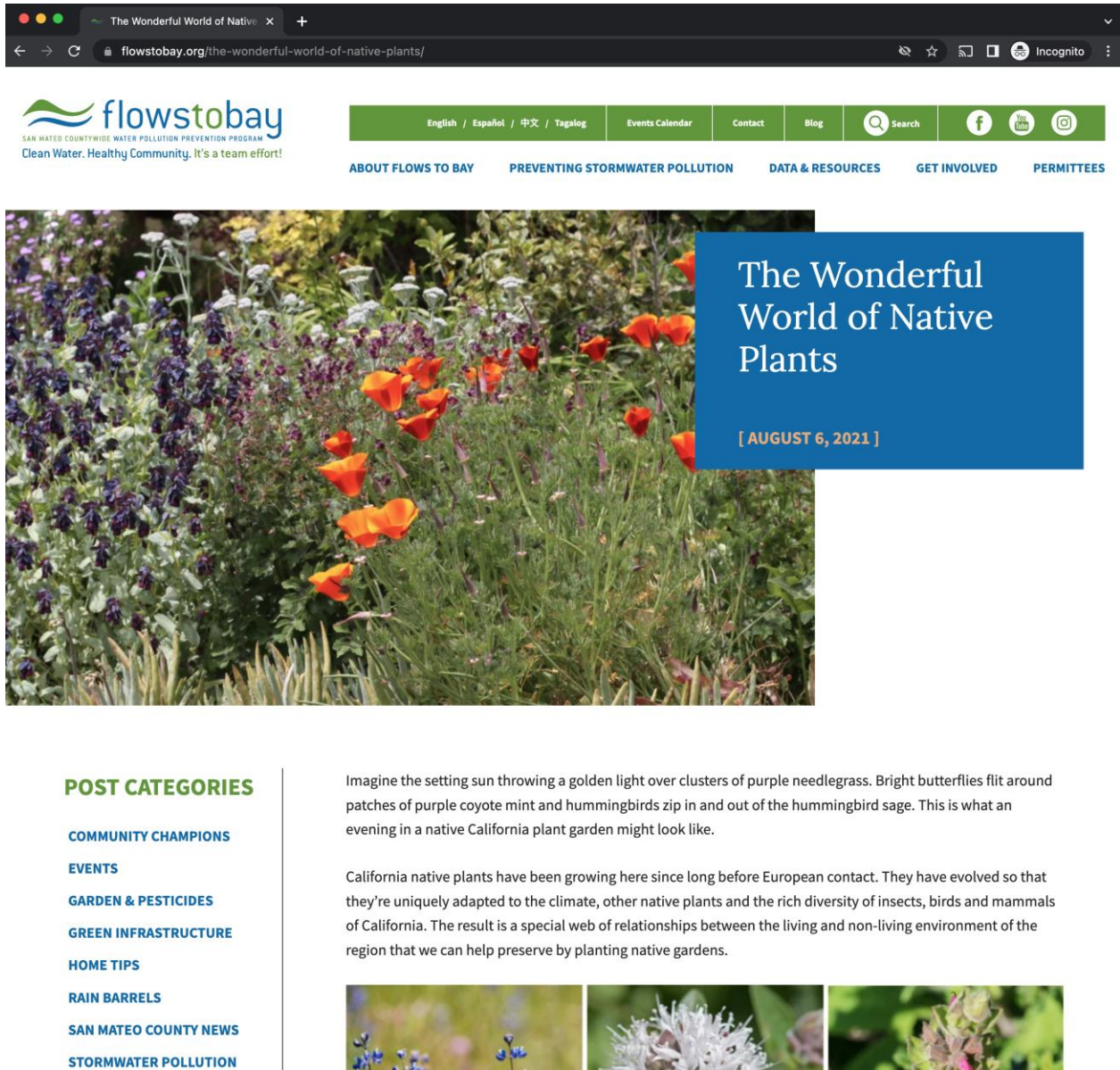


Figure 15-10. Screenshot of blog on SWMPPP’s website that featured native plants



Eco-Friendly Weed Management Webinar

With the rains that San Mateo County received this winter, you may be looking forward to a thriving garden this spring. However, you may also find yourself dealing with pesky weeds. Join our free webinar to learn how to identify weeds and deal with them in a safe and eco-friendly way using herbicides only as a last resort! The webinar will take place online on **Saturday, March 12, 2022 from 10 - 11:30 am** with a Q&A session at the end.

All San Mateo County residents 18 years or older who take a short 3-minute survey after the webinar will be entered into our raffle for a \$100 gift card to your choice of either Hassett Ace Hardware, Home Depot, or Lyngso Garden Materials to assist with your spring weed management!

Figure 15-11. Screenshot of newsletter sent on Feb. 26 promoting a webinar on reducing herbicide use

FUTURE ACTIONS

In FY 2022/23, SMCWPPP will continue to assist member agencies to comply with requirements in the reissued regional municipal stormwater permit (MRP 3.0) related to conditionally exempt non-stormwater discharges, including conducting selected types of related outreach.

Appendix 1

- Stormwater Committee – Attendance List for FY 2021/22

2021-22 Stormwater Committee Attendance																
Agency	Representative	Position	July	Aug	Sept	Oct	Nov 4 (sp. mtg.)	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	
Atherton	Robert Ovadia	Public Works Director	X	X		X	X	X	Canceled	X	X	X	X	Canceled	Canceled	
Belmont	Peter Brown	Public Works Director	X	X	X	X	X			X	X	X	X			
Brisbane	Randy Breault	Public Works Director/City Engineer	X	X	X	X	X	X			X	X	X			X
Burlingame	Syed Murtuza	Public Works Director	O	X	X	X		X			O	X	X			
Colma	Brad Donohue	Director of Public Works and Planning	X	O		X	X	O			O	X	O			
Daly City	Richard Chiu	Public Works Director		X	X	X	X	X			X	X	X			X
East Palo Alto	Kamal Fallaha	City Engineer	O					O								
Foster City	Dante Hall (through Nov)/Louis Sun	Acting/Public Works Director		O	O						X	X	X			X
Half Moon Bay	Maziar Bozorginia	City Engineer	X	X	X		X	X			X	X	X			X
Hillsborough	Paul Willis	Public Works Director		X	X	X	X	X			X	X	X			X
Menlo Park	Nikki Nagaya	Public Works Director	X	X	X	X	X	X					X			X
Millbrae	Andrew Yang	Senior Engineer	X	X	X	X	X	X			X	X	X			X
Pacifica	Lisa Petersen	Public Works Director/City Engineer	X		X	O	X	X			X	X	X			X
Portola Valley	Howard Young	Public Works Director	X	X	X	X		X			X	X	X			X
Redwood City	Saber Sarwary	Supervising Civil Engineer	X					X			X		X			
San Bruno	Hae Won Ritchie (through Dec) Matthew Lee	Interim/Public Works Director	X	X	X	X	X	X			X	X	X			X
San Carlos	Steven Machida	Public Works Director	X	X	X	X	X	X			X		X			X
San Mateo	Azalea Mitch	Public Works Director	X		X	X		X			X	X	X			X
South San Francisco	Eunejune Kim	Public Works Director	X	X	X	X	X	X				X	X			
Woodside	Sean Rose	Public Works Director	X			X	X	X			X		X			X
San Mateo County	Jim Porter (through July)/Ann Stillman	Public Works Director/Interim Public Works Director	O	X	X	X	X	X		X	X	X	X			
Regional Water Quality Control Board	Tom Mumley	Assistant Executive Officer														

"X" - Committee Member Attended

"O" - Other Jurisdictional Representative Attended

Appendix 2

- Municipal Maintenance Subcommittee – Attendance List for FY 2021/22

SMCWPPP Municipal Maintenance Subcommittee Attendance FY 2021/22

NAME	MUNICIPALITY	3/23/2022	6/29/2022
Ryan Moran	Belmont	✓	
Marcus Escobedo	Belmont	✓	✓
Brandon Tyler	Belmont		✓
Tim Murray	Belmont		✓
Keegan Black	Brisbane		✓
Jennifer Lee	Burlingame	✓	
Sibely Calles	Daly City	✓	
Michelle Daher	East Palo Alto		✓
Amir Mahmoudi	East Palo Alto		✓
Greg Baeza	Foster City	✓	✓
Taniela Mapa	Foster City	✓	✓
Laura Galli	Foster City		✓
Hugo Torres	Menlo Park		✓
Christopher Falzon	Millbrae	✓	✓
Vicki Sherman	Redwood City	✓	✓
Adrian Lee	Redwood City		✓
Ted Chapman	San Bruno	✓	
Sean Morris	San Bruno		✓
Vatsal Patel	San Carlos		✓
Sven Edlund	San Mateo	✓	✓
John Allan	San Mateo County	✓	
Selena Gonzalez	San Mateo County	✓	
Sultan Henson	San Mateo County	✓	✓
Casey Stevenson	San Mateo County		✓
Krista McDonald	San Mateo County		✓
Sultan Henson	San Mateo County	✓	✓
Marissa Garren	South San Francisco		✓
Casey Stevenson	San Mateo County Mosquito and Vector Control		✓
Ryan Thorndike	San Mateo County Mosquito and Vector Control	✓	✓
Kelly Carroll	CSG/ Half Moon Bay/ Colma	✓	✓
Reid Bogert	C/CAG		✓
Kristin Kerr	EOA, Inc.	✓	✓
Kathy Woo	EOA, Inc.	✓	
Eliza Perkins	EOA, Inc.		✓

Appendix 3

- New Development Subcommittee – Attendance List for FY 2021/22
- Biotreatment Soil Media – Tree Design Work Group Meeting Summary 1/26/2022
- Annual Development Workshop – Moving Ahead with GI and LID Implementation August 18, 2021
 - Workshop Agenda
 - Workshop Attendance
 - Workshop Evaluation Summary
- Annual Development (C.3) Workshop June 22, 2022
 - Workshop Agenda
 - Workshop Attendance
 - Workshop Evaluation Summary



New Development Subcommittee

FY 2021-22 Meeting Attendance

Representing	Name	Phone Number	Aug	Nov	Feb	May
Atherton	Ralph Robinson	650-752-0544	X			
Belmont	Anwar Mirza	650-637-2985	X	X		
	Elizabeth Wada	650-595-7468	X	X	X	X
Brisbane	Ken Johnson	415-508-2120	X	X		
	Julia Ayres			X	X	
Burlingame	Jennifer Lee	650-558-7381	X	X	X	X
	Martin Quan		X			
Colma	Muneer Ahmed	650-757-8894	X	X	X	X
	Kelly Carroll	408-921-4480	X	X	X	X
County of San Mateo	Camille Leung	650-363-1826	X	X		X
	John Allan	650-363-4071	X	X	X	X
	Melody Eldridge	650-363-1812		X	X	
	Julie Casagrande				X	X
	Selena Gonzalez					X
	Sultan Henson				X	X
C/CAG – SMCWPPP	Reid Bogert	650-599-1419,33	X	X	X	X
Daly City	Sibely Calles	650-991-8054	X	X	X	X
	Carmelisa Morales	650-991-8156	X	X	X	X
East Palo Alto	Michelle Daher	650-853-3126				
EOA-SMCWPPP	Jill Bicknell	408-720-8811 x1	X	X	X	X
	Peter Schultze-Allen	510-832-2852 x128	X	X	X	X
Paradigm	Steve Carter					X
	Dustin Bambic					X
Foster City	Taniela Mapa	650-286-3270			X	X
Half Moon Bay	Kelly Carroll	408-921-4480	X	X	X	X
	Maziar Bozorgina/Jonathan Woo	650-726-7177	X			
Hillsborough	Natalie Gribben/Kelly Carroll	650-375-7444	X		X	X
	Doug Belcik	650-375-7444	X		X	X
	Irfan Aziz		X	X	X	X
Menlo Park	Rambod Hakhamaneshi	650-330-6740			X	X
Millbrae	Andrew Yang	650-259-2351	X			
	Sam Fielding		X		X	X
	Roscoe Mata			X		
	Kelly Carroll	650-522-2506		X	X	X
Pacifica	Helen Gannon	650-738-7444			X	X
	Bonny O'Connor	650-738-3767	X	X		
Portola Valley	CheyAnne Brown	650-851-1700	X	X	X	X
Redwood City	James O'Connell	650-780-5923		X	X	X
San Bruno	Matt Neuebaumer	650-616-7042		X	X	X
	Joanna Kwok	650-616-7052			X	X
San Carlos	Vatsal Patel	650-802-4212		X		X
	Mohit Chaudhary				X	
San Mateo (City)	Bradley Harms	650-522-7333	X	X	X	X
	Gustavo Lopez		X	X	X	X
	Tracy Scramaglia			X	X	X
	Babak Kaderi/Karen Magallanes		X	X	X	X
	Ryan Brunmeier		X			
	Sarah Scheidt					X
	Sven Edlund	650-522-7296	X	X		X
San Mateo County RCD	Noah Katz/Nicole Schmidt	650-712-7765 x117				X
South S.F.	Andrew Wemmer	650-829-3840	X	X	X	X
Woodside	Dong Nguyen/Muneer Ahmed	650-851-6790	X	X	X	X

Bay Area Municipal Stormwater Collaborative
Development Subcommittee
Biotreatment Soil Media (BSM) – Tree Design Work Group
Wednesday, January 26, 2022
Meeting Summary

Attending:

Jill Bicknell, SCVURPPP

Peter Schultze-Allen, SMCWPPP/SCVURPP

Annalise Elder, County of Santa Clara

Naresh Duggal, County of Santa Clara

Chris Curry, County of Santa Clara

Kit Jory, City of Fremont

Thomas Eddy, City of San Jose

Connie Goldade, CD+A

Charlie Drechsler, City of Redwood City

Igor Lacan, UC Cooperative Extension

Megan Wheeler, SF Estuary Institute

Kelly Havens, Geosyntec

Brad Hunt, City of Palo Alto

Peter Gollinger, City of Palo Alto

Rachel Roberts, DeepRoot GI

Daniel Krug, County of San Mateo

Reid Bogert, SMCWPPP

Catherine Martineau, Canopy

Russell Hansen, City of San Jose

Jim Scanlin, ACCWP

The attendees introduced themselves and discussed the agenda for the meeting.

Peter reviewed the summary of the May 2021 Work Group meeting along with the background and purpose of the Work Group:

To produce one or more designs for tree well filters (aka stormwater trees) that meet the requirements and needs of both trees and the municipal regional stormwater permit (MRP) and to share information on the integration of trees and stormwater management.

[Trees in GSI Survey](#): Igor Lacan, from UC Cooperative Extension, discussed the results of the survey that he created to collect information on the trees and bioretention systems in the SF Bay Area. To date, six responses to the survey have been collected. Igor asked the Work Group to solicit colleagues and others for more responses. The survey questions include type of tree species planted, soil media used and the results/condition of the bioretention areas and trees in them.

[Santa Clara Valley Urban Forestry Alliance](#) (SCVUFA): Chris Curry, Naresh Duggal and Annalise Elder from the County of Santa Clara presented a summary of the activities and goals of SCVUFA. The Work Group agreed to coordinate efforts and share information with SCVUFA going forward.

[Composted Wood Mulch specification for Biotreatment Areas](#). Peter shared information on the final version of the wood mulch specification that is now posted on the [SCVURPPP](#) and [SMCWPPP](#) program websites. The product will also be known as Biotreatment Wood Mulch (BWM). The next step is to work with Bay Area composters and BSM vendors to develop a list of companies that can supply the product.

The next meeting of the Work Group will be in the Fall of 2022 – date to be determined.



Annual Development Workshop

Moving Ahead with GI and LID Implementation

August 18, 2021

9:00 AM – 2:00 PM

via Zoom

WORKSHOP TOPICS/SCHEDULE/SPEAKERS

9:00 AM	Basic Training: Permit Requirements for Provision C.3 <i>Low Impact Development and Green Infrastructure</i>	Jill Bicknell, <i>EOA</i>
9:45 AM	BREAK	
9:50 AM	Welcome <i>Logistics and Agenda Overview</i>	Reid Bogert, <i>SMCWPPP</i>
10:00 AM	Update on Upcoming Stormwater Permit Requirements	Jill Bicknell, <i>EOA</i>
10:15 AM	SMCWPPP Program Update - Schools and GI	Reid Bogert, <i>SMCWPPP</i>
10:30 AM	BREAK	
10:40 AM	GI Projects around the Bay: <ul style="list-style-type: none">• City of Burlingame – Rotary Project• City of Berkeley – Precast Pervious Concrete Slabs• City of San Mateo – Frontage Requirements and Projects• Questions & Answers	Lisha Mai, <i>City of Burlingame</i> Peter Schultze-Allen, <i>EOA</i> Sven Edlund, <i>City of San Mateo</i>
11:30 AM	Maintenance Mechanisms/Approaches for Public GI Systems <ul style="list-style-type: none">• Permittee processes - contracting, in-house, private• Challenges, common problems• Questions & Answers	Panel Discussion Sarah Scheidt, <i>City of San Mateo</i> James O'Connell, <i>City of Redwood City</i>
12:00 PM	LUNCH BREAK	
12:20 PM	GI Projects around the Bay (continued): <ul style="list-style-type: none">• San Pablo Ave Stormwater Spine Project• Orange Memorial Park Regional Stormwater Facility• Questions & Answers	Josh Bradt, <i>San Francisco Estuary Partnership</i> Bianca Liu, <i>City of South San Francisco</i> Rob Dusenbury, <i>Lotus Water</i>
1:10 AM	Technical Details, Processes and Projects: <ul style="list-style-type: none">• Silva Cells in Regulated Project Frontages• County of San Mateo GI Feasibility Analyses• Biotreatment Soil Media Submittal Procedures• Questions & Answers	Rachel Roberts, <i>DeepRoot</i> Julie Casagrande, <i>County of SM</i> Peter Schultze-Allen, <i>EOA</i>
2:00 PM	Adjourn	

Attendance Record - SMCWPPP C.3 Workshop - August 18, 2021

	First Name	Last Name	Agency Name
1	Reid	Bogert	C/CAG
2	Connie	Goldade	CD+A
3	Bozhena	Palatnik	City of Belmont
4	Elizabeth	Wada	City of Belmont
5	Keegan	Black	City of Brisbane
6	Keegan	Black	City of Brisbane
7	Randy	Breault	City of Brisbane
8	Lisha	Mai	City of Burlingame
9	Sibely	Calles	City of Daly City
10	Carmelisa	Morales	City of Daly City
11	Adrian	Biggs	City of East Palo Alto
12	Greg	Baeza	City of Foster City
13	Matthew	Chan	City of Foster City
14	Frank	Fanara	City of Foster City
15	Laura	Galli	City of Foster City
16	Allen	Smith	City of Foster City
17	Rambod	Hakhamaneshi	City of Menlo Park
18	Eric	Hinkley	City of Menlo Park
19	Scott	Jaw	City of Menlo Park
20	Edress	Rangeen	City of Menlo Park
21	Sam	Fielding	City of Millbrae
22	Zoe	Covello	City of Pacifica
23	Raymund	Donguines	City of Pacifica
24	Lawrence	Henriquez	City of Pacifica
25	Bonny	O'Connor	City of Pacifica
26	Paolo	Baltar	City of Redwood City
27	Alex	Chan	City of Redwood City
28	James	O'Connell	City of Redwood City
29	Theresa	Santos	City of Redwood City
30	Patti	Schrotenboer	City of Redwood City
31	Joanna	Kwok	City of San Bruno
32	Greg	Albert	City of San Mateo
33	Greg	Albert	City of San Mateo

	First Name	Last Name	Agency Name
34	Ryan	Brunmeier	City of San Mateo
35	Sven	Edlund	City of San Mateo
36	Bradley	Harms	City of San Mateo
37	Gustavo	Lopez	City of San Mateo
38	Karen	Magallanes	City of San Mateo
39	Sarah	Scheidt	City of San Mateo
40	Bianca	Liu	City of South San Francisco
41	Thomas	Siphongsay	City of South San Francisco
42	Andrew	Wemmer	City of South San Francisco
43	Sonal	Aggarwal	County of San Mateo
44	Bryan	Albini	County of San Mateo
45	John	Allan	County of San Mateo
46	Zack	Azzari	County of San Mateo
47	Olivia	Boo	County of San Mateo
48	Julie	Casagrande	County of San Mateo
49	A	DeGuzman	County of San Mateo
50	Melody	Eldridge	County of San Mateo
51	Selema	Gonzalez	County of San Mateo
52	Hanieh	Houshmandi	County of San Mateo
53	Emmett	Jackson	County of San Mateo
54	Kelsey	Lang	County of San Mateo
55	Richard	Lee	County of San Mateo
56	Camille	Leung	County of San Mateo
57	Anthony	Lum	County of San Mateo
58	Michelle	Manalo	County of San Mateo
59	Wencyn	Ng	County of San Mateo
60	Sina	Oshaghi	County of San Mateo
61	Monika	Raman	County of San Mateo
62	John	Schabowski	County of San Mateo
63	Delaney	Selvidge	County of San Mateo
64	Chanda	Singh	County of San Mateo
65	Milton	Wong	County of San Mateo
66	Harry	Yip	County of San Mateo
67	Johnson	Young	County of San Mateo

	First Name	Last Name	Agency Name
68	Alex	Zhang	County of San Mateo
69	Michelle	Bocalan	CSG Consultants, Inc.
70	Mario	Camorongon	CSG Consultants, Inc.
71	Catherine	Chan	CSG Consultants, Inc.
72	Jeffrey	Lee	CSG Consultants, Inc.
73	Frank	Navarro	CSG Consultants, Inc.
74	Peniel	Ng	CSG Consultants, Inc.
75	Rachel	Roberts	Deeprout GI
76	Rob	Dusenbury	Lotus Water
77	Josh	Bradt	San Francisco Estuary Partnership
78	Victoria	Belli	Schaaf & Wheeler
79	Robin	Lee	Schaaf & Wheeler
80	Muneer	Ahmed	Town of Colma
81	Irfan	Aziz	Town of Hillsborough
82	Douglas	Belcik	Town of Hillsborough
83	Sindhi	Mekala	Town of Woodside
84	Dan	Farah	Veolia North America
85	Laura	Suarez	Veolia North America



SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

EVALUATION SUMMARY

Attendance: 85

Evaluations: 41

SMCWPPP C.3 WORKSHOP
Wednesday, August 18, 2021

Overall, how informative did you find the webinar?

Very helpful **34** Somewhat helpful **7** Not helpful **0**

Comments on Overall Content

- Appreciated all the updates regarding the new MRP.
- Presenters provided very useful information on stormwater regulations and other relevant stormwater related issues. (x9)
- Great and well-prepared speakers. (x2)
- Overall, I have learned an incredible amount.
- Very interesting/insightful. (x2)
- It was enjoyable and helpful to see the variety of projects across the Bay Area. (x7)
- It was helpful to see photos and details involved in GI projects (such as identifying issues, lessons learned, funding, conceptual design, outreach, and construction). (x5)

Comments on Overall Structure

- Good webinar, very well organized (x5)
- Filled in the entire program with good information. (x2)
- It seemed like there were more topics that gave tools to either work on or plan for GI.
- I appreciated that the workshop didn't take the entire day.
- A lot jammed into the time. Some presentations were rushed.
- The lunch break was rushed.
- Hands-on exercises missing.
- Great! Well-structured and timed. Could have been shorter by 1 presentation.
- The slides made it easy to follow.
- It would be good to have the PPT slides ahead of time so that we have something to reference and take notes on during the workshop.



SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

Annual Development (C.3) Workshop
MRP 3.0 and GI-LID Maintenance, June 22, 2022

[Webinar Registration Link](#)

WORKSHOP AGENDA

9:00 AM	Basic Training: Current Permit Requirements for Provision C.3 Q&A	Peter Schultze-Allen, <i>EOA, Inc.</i>
9:45 AM	BREAK	
9:50 AM	Welcome <ul style="list-style-type: none">Logistics and Agenda Overview	Reid Bogert, <i>SMCWPPP</i>
10:00 AM	Regulatory Changes: Overview of New Permit Requirements (MRP 3.0) <ul style="list-style-type: none">Parcel-Based Regulated ProjectsRoad Maintenance and ReconstructionSpecial ProjectsGreen Infrastructure Implementation Q&A	Jill Bicknell, <i>EOA, Inc.</i>
11:00 AM	BREAK	
11:15 AM	Tips for a Successful O&M Inspection Program <ul style="list-style-type: none">Updating the Standard O&M AgreementExecuting the AgreementAnnual Inspection Reminders to Property OwnersConducting Inspections Q&A	Jennifer Lee, <i>City of Burlingame</i>
11:45 AM	Bioretention Maintenance Best Practices: <ul style="list-style-type: none">Overview of Bioretention Maintenance NeedsA New Approach for Identifying and Maintaining Plants in Biotreatment MeasuresMulch Types, Usage, and New Specification Q&A	Peter Schultze-Allen, <i>EOA, Inc.</i>
1:00 PM	ADJOURN	

Attendance Record - SMCWPPP C.3 Workshop - June 22, 2022

	First Name	Last Name	Agency Name
1	Reid	Bogert	C/CAG
2	Elizabeth	Wada	City of Belmont
3	Julia	Ayres	City of Brisbane
4	Keegan	Black	City of Brisbane
5	Jen	Lee	City of Burlingame
6	Sibely	Calles	City of Daly City
7	Jonathan	Woo	City of Half Moon Bay
8	Chris	Witschi	City of Menlo Park
9	Rambod	Hakhamaneshi	City of Menlo Park
10	Rene	Morales	City of Menlo Park
11	Andy	Wong	City of Millbrae
12	Roscoe	Mata	City of Millbrae
13	Lawrence	Henriquez	City of Pacifica
14	James	O'Connell	City of Redwood City
15	Patti	Schrotenboer	City of Redwood City
16	Theresa	Santos	City of Redwood City
17	Vicki	Sherman	City of Redwood City
18	Evan	Cai	City of San Carlos
19	Karen	Magallanes	City of San Mateo
20	Laura	Richstone	City of San Mateo
21	Michael	Titsworth	City of San Mateo
22	Ryan	Brunmeier	City of San Mateo
23	Sven	Edlund	City of San Mateo
24	Tracy	Scramaglia	City of San Mateo
25	Daniel	Garza	City of South San Francisco
26	Thomas	Siphongsay	City of South San Francisco
27	Aaron	Mao	County of San Mateo
28	Alan	Velasquez	County of San Mateo
29	Atkins	De Guzman	County of San Mateo
30	Camille	Leung	County of San Mateo

	First Name	Last Name	Agency Name
31	Johnson	Young	County of San Mateo
32	Julie	Casagrande	County of San Mateo
33	Krista	McDonald	County of San Mateo
34	Melody	Eldridge	County of San Mateo
35	Monika	Raman	County of San Mateo
36	Sam	Becker	County of San Mateo
37	Selena	Gonzalez	County of San Mateo
38	Sina	Oshaghi	County of San Mateo
39	Sultan	Henson	County of San Mateo
40	Zachary	Ruybal	County of San Mateo
41	Zack	Azzari	County of San Mateo
42	Babak	Kaderi	CSG Consultants, Inc.
43	Catherine	Chan	CSG Consultants, Inc.
44	Debbie	Bryan	CSG Consultants, Inc.
45	Kelly	Carroll	CSG Consultants, Inc.
46	Mario	Camorongan	CSG Consultants, Inc.
47	Mark	Lander	CSG Consultants, Inc.
48	Michelle	Bocalan	CSG Consultants, Inc.
49	Stephen	Tovmassian	CSG Consultants, Inc.
50	Cindy	Do	Lotus Water
51	Robin	Lee	Schaaf & Wheeler
52	sandra	carroll	Schaaf & Wheeler
53	Muneer	Ahmed	Town of Colma
54	Douglas	Belcik	Town of Hillsborough
55	Irfan	Aziz	Town of Hillsborough
56	Sindhi	Mekala	Town of Woodside
57	Laura	Suarez	Veolia North America



Workshop Evaluation Summary

57 Attendees

21-57 Responses per Question

Annual Development (C.3) Workshop MRP 3.0 and GI-LID Maintenance Zoom Meeting - Wednesday, June 22, 2022

What Did You Think of the Following Presentations?

1. **Basic Training: Current Permit Requirements for Provision C.3** – Peter Schultze-Allen, *EOA, Inc.*

37 very helpful 12 somewhat helpful 0 not helpful

2. **Regulatory Changes: Overview of New Permit Requirements (MRP 3.0)** – Jill Bicknell, *EOA, Inc.*

51 very helpful 6 somewhat helpful 0 not helpful

3. **Tips for a Successful O&M Inspection Program** – Jennifer Lee, *City of Burlingame*

42 very helpful 4 somewhat helpful 0 not helpful

4. **Bioretention Maintenance Best Practices** – Peter Schultze-Allen, *EOA, Inc.*

33 very helpful 7 somewhat helpful 0 not helpful

Did this workshop meet your expectations?

31 Yes 3 Somewhat 0 No

Are you willing to make a short presentation at future trainings?

7 Don't Call me, I'll Call You 10 I'll think about it 4 Yes

Do you have any general comments on the training?

- Great presentations, thank you. (x8)
- Too long. Might be a good idea to split up into two shorter sessions. (x2)
- O&M program example was helpful. It was a little less C.3 how-to-comply, which I was hoping to get for some of our new staff, but good overall.
- Some presenter's audios are very soft, hard to hear. Peter's audio is excellent.
- Jill's presentation was very informative and helpful to parse out the differences in the new permit. Due to the nature and the level of detail she needed to present on, it was hard to stay focused to retain all the information. I think her

presentation will be valuable reference later as I become more familiar with MRP 3.

- All the presentations were well done. Peter's presentations covered a lot of material I was already familiar with, so were not as useful to me as the other presentations. This is not a reflection on Peter's work.
- Better polling questions and more of them and more challenging to keep folks engaged

Do you have any ideas for topics for future trainings?

- Break up more into "new" and "advanced"? Also, hydromodification/BAHM is something I am lacking on, though maybe too much for these trainings.
- Implementing GI numerical requirements.
- Updates to the guidance I'm assuming
- Bioswale presentations, perhaps going over 6in minimum ponding depth, overflow pipe minimum raised above soil, perforated pipe types, etc.
- How to conduct inspections at C.3 regulated projects during construction to make sure everything is installed per plan
- Recommendations and strategies to obtain a dedicated revenue source for stormwater programs
- More C.3 training on the new MRP.
- It would be useful to discuss how agencies plan on coordinating private development and public projects to track how they are achieving the MRP 3.0 GI numerical requirements.

Appendix 4

- CII Subcommittee – Attendance List for FY 2021/22
- CII Stormwater Inspector Workshop – June 28, 2022
 - Workshop Agenda
 - Attendance List
 - Evaluations Summary

SMCWPPP Commercial/Industrial/Illicit Discharge (CII) Subcommittee Attendance – FY 2021/22

Name	Agency	10/5/21	12/7/21	3/1/22	6/7/22
Ralph Robinson	City of Atherton	✓			
Bozhena Palatnik	City of Belmont	✓	✓	✓	✓
Keegan Black	City of Brisbane	✓	✓		✓
Jennifer Lee	City of Burlingame	✓		✓	✓
Dan Ferah	City of Burlingame (Veolia)	✓	✓		
Manny Molina	City of Burlingame (Veolia)				✓
Richard Kraft	City of Burlingame (Veolia)				✓
Laura Suarez	City of Burlingame (Veolia)				✓
Louis Gotelli	City of Colma	✓		✓	
Ward Donnelly	City of Daly City	✓	✓	✓	✓
Sibely Calles	City of Daly City	✓	✓	✓	✓
Adreian Biggs	City of East Palo Alto				✓
Laura Galli	City of Foster City	✓			
Taniela Mapa	City of Foster City		✓	✓	✓
Scott Jaw	City of Menlo Park	✓	✓	✓	✓
Cliff Ly	City of Millbrae				✓
Lawrence Henriquez	City of Pacifica				✓
Vicki Sherman	City of Redwood City	✓	✓	✓	
Robert Wood	City of San Bruno		✓		
Vatsal Patel	City of San Carlos	✓	✓	✓	✓
Sarah Scheidt	City of San Mateo				
Bradley Harms	City of San Mateo	✓	✓		✓
Gustavo Lopez	City of San Mateo	✓	✓	✓	✓
Sven Edlund	City of San Mateo		✓		✓
Daniel Garza	South San Francisco	✓		✓	✓
Pat Ledesma	County of San Mateo	✓		✓	✓
John Allan	County of San Mateo	✓	✓	✓	
Sultan Henson	County of San Mateo			✓	✓
Susan Hiestand	Silicon Valley Clean Water (SVCW)	✓	✓	✓	✓
Kelly Carroll	CSG/ Half Moon Bay/ Colma/Portola Valley	✓		✓	✓
Nick Zigler	CSG/ Colma/ Half Moon Bay	✓			
Reid Bogert	SMCWPPP Staff	✓	✓	✓	✓
Kristin Kerr	EOA, Inc.	✓	✓	✓	✓
Kylie Kammerer	EOA, Inc.	✓	✓		
Eliza Perkins	EOA, Inc.			✓	



SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

**Commercial, Industrial and Illicit Discharge Stormwater Inspector
Training Workshop**

Sponsored by the Commercial/Industrial/Illicit Discharge (CII) Subcommittee

Tuesday, June 28, 2022

Zoom Meeting

AGENDA

9:00 AM	Welcome	Reid Bogert, C/CAG
9:10 AM	Assessing Creek Health in San Mateo County Watersheds	Paul Randall, EOA, Inc.
9:40 AM	Performing Stormwater Inspections Modules Part 1: Preventing Stormwater Pollution Part 2: Understanding the Permit	<i>West Valley Clean Water Program Videos</i>
9:50 AM	MRP 3.0 is Here: New Stormwater Permit Requirements	Kristin Kerr, P.E., EOA, Inc.
10:20 AM	Performing Stormwater Inspections Modules Part 3: Inspecting a Facility Part 4: Facility Inspection Debrief	<i>West Valley Clean Water Program Videos</i>
10:40 AM	Performing Stormwater Inspections to Identify Nonstormwater Discharges and Control Illicit Discharges	Patrick Ledesma, San Mateo County Environmental Health
11:10 AM	Summary Remarks	Kristin Kerr, P.E., EOA, Inc.
11:15 AM	Adjourn	

Attendance at this workshop is acceptable for 2.0 Contact Hours toward maintaining CWEA certifications.

**SMCWPPP Commercial, Industrial and Illicit Discharge Stormwater Inspector Training Workshop
June 28, 2022**

	First Name	Last Name	Agency/Company
1	David	Martinez	City of Belmont
2	Keegan	Black	City of Brisbane
3	Batool	Zaro	City of East Palo Alto
4	Ben	Zarrabi	City of East Palo Alto
5	Kevin	Lewis	City of East Palo Alto
6	Pete	Garcia	City of Foster City
7	Taniela	Mapa	City of Foster City
8	Scott	Jaw	City of Menlo Park
9	Cliff	Ly	City of Millbrae
10	Lawrence	Henriquez	City of Pacifica
11	Adalberto	Munguia	City of Redwood City
12	Cory	Cattaneo	City of Redwood City
13	Sergio	Rodriguez	City of Redwood City
14	Vicki	Sherman	City of Redwood City
15	Jason	Claire	City of Redwood City
16	Victor	Castaneda	City of Redwood City
17	Bradley	Harms	City of San Mateo
18	Eric	Morkve	City of San Mateo
19	Gustavo	Lopez	City of San Mateo
20	Sven	Edlund	City of San Mateo
21	Natasha	Gutierrez	City of South San Francisco
22	Nelson	Yuk	City of South San Francisco
23	Thomas	Siphongsay	City of South San Francisco
24	Jay	Gonzales	CSG Consultants
25	Kareem	Arabi	CSG Consultants
26	Kelly	Carroll	CSG Consultants
27	Amy	DeMasi	San Mateo County
28	Andy Myers	Myers	San Mateo County
29	Krista	McDonald	San Mateo County
30	Sabrina	Mih	San Mateo County
31	Sultan	Henson	San Mateo County
32	Carson	Beck	San Mateo County Environmental Health
33	Dan	Rompf	San Mateo County Environmental Health
34	Dirk	Jensen	San Mateo County Environmental Health
35	Erin	Thomas	San Mateo County Environmental Health
36	Jason	Buenaflor	San Mateo County Environmental Health
37	Patrick	Ledesma	San Mateo County Environmental Health
38	Wesley	Won	San Mateo County Environmental Health
39	Jennifer	Gonzales	San Mateo County Environmental Health
40	Benjamin	Padua	Silicon Valley Clean Water
41	Mark	Swenson	Silicon Valley Clean Water
42	Muneer	Ahmed	Town of Colma
43	Laura	Suarez	Veolia
44	Manuel	Molina	Veolia-Burlingame

SMCWPPP CII Stormwater Inspector Training Workshop

Sponsored by the Commercial/Industrial/Illicit Discharge (CII) Subcommittee

Zoom Meeting

Tuesday June 28, 2022

1. Poll Question: How many times have you attended SMCWPPP CII Subcommittee Stormwater Inspector workshops before?

- This is my first – **14**
- 1-2 – **7**
- 3-5 – **5**
- 6-10 – **5**
- Not enough fingers to count – **1**

2. Poll Question: What types of other inspections do you currently do?

- Commercial Business Stormwater Inspections (C.4) - **24**
- Illicit Discharges (C.5) - **19**
- Pretreatment Program facility inspections - **8**
- Restaurant FOG Inspections – **8**
- NOI Industrial Facility Stormwater Inspections (C.4) – **13**
- CUPA Inspections- **10**
- Construction site stormwater inspection (C.6) – **12**
- Health Department Inspections – **2**

3. Poll Question: Which type of training do you prefer?

- In-person classroom **6**
- Virtual online training **14**
- Either **13**

4. How useful was the presentation “Assessing Creek Health in San Mateo County Watersheds” (Paul Randall, EOA, Inc.)?

Very Useful **18**

Somewhat Useful **5**

Not Useful **0**

Comments (optional):

- It would be helpful if we could provide more information on the water quality trends and maybe link with it what we have been doing to improve impaired water bodies. I did appreciate Paul acknowledging that repeatable data is needed. We historically have not

collected data that facilitates trend interpretation.

- Great informative class.
- It was refreshing to see a purpose of doing these inspections and reinforce that there should be no pollutants in the drain.
- Very interesting and relevant.
- I appreciate Reid and Paul's slide shows that tied together the importance of our inspections with the impact on aquatic life.
- Very informative and give us more reason to take stormwater violation seriously.
- Loved learning about the efforts to assess the health of the creeks and the different species being monitored.

5. How useful were the “Performing Stormwater Inspections Modules 1-4” (West Valley Clean Water Program Videos)?

Very Useful **19**

Somewhat Useful **4**

Not Useful **0**

Comments (optional):

- I’m looking forward to seeing the fourth video.
- The videos are well done.
- It was useful in terms of re-evaluating what is to be inspected and why.
- Lindsey spoke clearly and walked us through a typical inspection which was greatly appreciated as she explained the reasons behind what an area of concern was.
- Enjoyed the virtual inspection with Lindsey.
- Great videos with excellent quality.
- Loved the videos from the West Valley Clean Water Authority!

6. How useful was the presentation “MRP 3.0 is Here: New Stormwater Permit Requirements” (Kristin Kerr, EOA, Inc.)?

Very Useful **18**

Somewhat Useful **5**

Not Useful **0**

Comments (optional):

- It’s probably very useful for municipal inspectors that cover the entire MRP.
- Good information based on permits required for different project applications.
- It is very beneficial to learn of the new updates for this coming July 1st permit. Highlighting the changes in blue was appreciated, as what the breakdown of the various permit sections, C.4, C.5 etc.
- Good to know the latest regulatory requirement.

7. How useful was the presentation “County Environmental Health Stormwater Business Inspection Case Studies” (Patrick Ledesma, San Mateo County Environmental Health)?

Very Useful **19**

Somewhat Useful **4**

Not Useful **0**

Comments (optional):

- Great job
- During these trainings, I always think it is good to differentiate between rainwater and potable water. Defining the commonly used acronyms was a great reminder and good information for the newer inspectors. Noting that we too are adhering to a permit's guidelines was a good reminder.

8. What did you find most valuable in this workshop?

- The videos (3)
- MRP requirements (2)
- I liked the poll questions - that was a neat interactive thing to have throughout
- The step-by-step approach on explaining the inspections and the details about their importance, and the presentation "Assessing Creek Health in San Mateo County Watersheds" as it was something new for me.
- All of it was great!
- Being able to participate by asking questions and needing answers as such problems due exist.
- Good review of Countywide Stormwater Program and overview of MRP 3.
- I appreciate the different agencies working together and openly communicating so we are all on the same page and will deliver a similar message to the public.
- Presentation on Assessing Creek Health in San Mateo County Watersheds (3)
- Case studies and updates.

9. What would you like to see in future workshops?

- More case studies (2)
- More demonstrative and examples of industrial, commercial, and construction inspections
- Please direct more emphases on NPDES and how some treatment plants located on our coastal cities play a major role in discharging. There are many things that you must consider with water and its distribution sources.
- More of the same, a mixture of refresher training, new permit developments, examples of actual and potential discharges.
- Creek health data (2)
- I think we could dedicate more time to questions and answers, but I appreciate that you did not make us wait until the end as the momentum on that specific topic can get lost.
- Actual impact to creeks and lakes from storm water violations

10. Did this training meet your expectations?

Yes 23 No 0

11. General Comments

- Good job – thank you!
- Thanks
- Excellent workshop.
- Also, it would be really good to provide the differences between organic and inorganic

materials and where they may come from, cross-connections found to infiltrate storm drains, and the reasons for maintaining storm drains to try and eliminate offsets within the inverts to prevent vegetation.

- Case Studies are always good.
- Loved it, thank you. I will take the time to read the new permit and update my message to owners/operators/the public appropriately. Thank you for information on the C.4. map.

Appendix 6

- CALBIG Meeting: Construction Site Stormwater Compliance –2021
 - Attendance List
- Construction Site Stormwater Inspections Training – March 30, 2022
 - Workshop Agenda
 - Attendance List
 - Evaluations Summary

CALBIG C.6 Presentation - October 2021 - Attendance Record

	First Name	Last Name	Organization
1	Farris	Hix	4LEAF & Leigh Simpson
2	Michael	Gorman	CALBIG
3	Sven	Edlund	City of San Mateo
4	Theresa	Engle	City of San Mateo
5	Calvin	Iwan	City of San Mateo
6	Taye	Nguyen	City of San Mateo
7	Mike	Titsworth	City of San Mateo
8	Kelly	Carroll	CSG Engineers
9	Jay	Gonzales	CSG Engineers
10	John	Arellano	Daly City
11	David	Hirzel	David Hirzel Design
12	Irfan	Azziz	Hillsborough
13	Doug	Belick	Hillsborough
14	Asahel Issac	Ocon	Hillsborough
15	Will	Racanelli	Hillsborough
16	Fred	Cullum	Independent Code Consultants
17	Henry	Calilong	Redwood City
18	Steve	Beams	Santa Clara County
19	Jeff	Benbow	WC-3
20	Joe	Rossback	WC-3



SAN MATEO COUNTYWIDE
Water Pollution Prevention Program
Clean Water. Healthy Community.

**Construction Site Stormwater Inspection
Training for Municipal Inspectors**

Wednesday, March 30, 2022

[Zoom Meeting](#), 9am - 12pm

Meeting ID: 853 3114 6776, Passcode: 863545
Dial-In Audio: (669)-900-6833

AGENDA

9:00 AM	Welcome	Reid Bogert, C/CAG
9:10 AM	Regulatory Basics and MRP 3.0 Update	Kristin Kerr, P.E., <i>EOA Inc.</i>
9:45 AM	Caltrans Erosion and Sediment Controls	Jack Broadbent, Supervising Landscape Architect, <i>Caltrans</i>
10:50 AM	Break	
11:00 AM	Construction Site Best Management Practices	Peter Schultze-Allen, <i>EOA, Inc.</i>
11:25 AM	Compost Socks vs. Fiber Rolls: The Smackdown!	Peter Schultze-Allen, <i>EOA Inc.</i>
11:50 AM	Q&A, Evaluations and Wrap Up	All
12:00 AM	Adjourn	

SMCWPPP C.6 Construction Workshop Attendance

March 30, 2022 9am-12pm

	First Name	Last Name	Agency
1	Ralph	Robinson	City of Atherton
2	David Martinez	Martinez	City of Belmont
3	Jared	Barrilleaux	City of Belmont
4	Keegan	Black	City of Brisbane
5	Jerred	Cayabyab	City of Burlingame
6	Jennifer	Lee	City of Burlingame
7	Richard	Kraft	City of Burlingame
8	Andrew	Gin	City of Daly City
9	Carmelisa	Morales Lopez	City of Daly City
10	Dean	Ricasa	City of Daly City
11	Ben	Zarrabi	City of East Palo Alto
12	Taniela	Mapa	City of Foster City
13	Scott	Jaw	City of Menlo Park
14	René	Morales	City of Menlo Park
15	Chris	Witschi	City of Menlo Park
16	Helen	Gannon	City of Pacifica
17	Lawrence	Henriquez	City of Pacifica
18	Jamie	Mosler	City of Pacifica
19	Ramon	Bernardo	City of Redwood City
20	Kahner	Hughes	City of Redwood City
21	Patti	Schrotenboer	City of Redwood City
22	Carlos	Varela	City of Redwood City
23	Mohit	Chaudhary	City of San Carlos
24	Justin	Erickson	City of San Carlos
25	Sven	Edlund	City of San Mateo
26	Bradley	Harms	City of San Mateo
27	Gustav	Lopez	City of San Mateo
28	Daniel	Garza	City of South San Francisco
29	Thomas	Siphongsay	City of South San Francisco
30	Nelson	Yuk	City of South San Francisco
31	Damien	Adams	County of San Mateo
32	Zack	Azzari	County of San Mateo
33	Scott	Burklin	County of San Mateo
34	Summer	Burlison	County of San Mateo
35	Armando	Carlos	County of San Mateo
64	Randall	Cohen	County of San Mateo
36	Melody	Eldrige	County of San Mateo
37	Theresa	Engle	County of San Mateo
38	Greg	Fontana	County of San Mateo
39	Aaron	Francis	County of San Mateo
40	Selena	Gonzalez	County of San Mateo
41	Hanieh	Houshmandi	County of San Mateo
42	Richard	Lee	County of San Mateo
43	Anthony	Lum	County of San Mateo

	First Name	Last Name	Agency
44	Michelle	Manalo Mason	County of San Mateo
45	Adolfo	Orellana	County of San Mateo
46	Ryan	Rasmussen	County of San Mateo
47	Joshua	Rawley	County of San Mateo
48	Ryan	Reynolds	County of San Mateo
49	Diana	Shu	County of San Mateo
50	Harry	Yip	County of San Mateo
51	Atkins	De Guzman	County of San Mateo
52	Sonal	Aggarwal	County of San Mateo
53	Kelly	Carroll	CSG Consultants
54	Catherine	Chan	CSG Consultants
55	Jen	Chen	CSG Consultants
56	Jay	Gonzales	CSG Consultants
57	Rocky	Kayali	CSG Consultants
58	Arash	Kimia	CSG Consultants
59	Irfan	Aziz	Town of Hillsborough
60	Douglas	Belcik	Town of Hillsborough
61	Isaac	Ocon	Town of Hillsborough
62	Sindhi	Mekala	Town of Woodside
63	Laura	Suarez	Veolia



Workshop Evaluation Summary

64 Attendees
24 - 32 Responses per Question

C.6 Construction Site Stormwater Inspection Training for Municipal Inspectors

Zoom Meeting Wednesday, March 30, 2022
9am – 12pm

What Did You Think of the Following Presentations?

- 1. Regulatory Basics and MRP 3.0 Update** –Kristin Kerr, *EOA, Inc.*
23 very helpful 8 somewhat helpful 0 not helpful
- 2. Caltrans Erosion and Sediment Controls** – Jack Broadbent, *Supervising Landscape Architect, Caltrans*
27 very helpful 1 somewhat helpful 0 not helpful
- 3. Construction Site Best Management Practices** – Peter Schultze-Allen, *EOA, Inc.*
25 very helpful 7 somewhat helpful 0 not helpful
- 4. Compost Socks vs. Fiber Rolls: The Smackdown!** – Peter Schultze-Allen, *EOA, Inc.*
23 very helpful 1 somewhat helpful 0 not helpful

Did this workshop meet your expectations?

26 Yes 4 Somewhat 0 No

Are you willing to make a short presentation at future trainings?

12 Don't Call me, I'll Call You 11 I'll think about it 2 Yes

Do you have any general comments on the training?

- Great presentation!
- Very helpful. Thank you.
- Good information especially enjoyed the Caltrans erosion control info.
- Great workshop.
- Very informative and valuable information was provided.

- I thought the training was really good, informative and I appreciated the change up of topics/speakers with inclusion of the Caltrans speaker and latest regarding compost vs. fiber rolls which made the workshop feel current and relevant.
- Great training as always! The compost rolls have been pushed hard to municipal staff in the last few years and I think we've gotten the message. I know I have and no longer use straw. I think the disconnect is in how to get contractors to convert. We cannot dictate BMPs, only their results. Is there a way to push the man hour reduction in installation of compost over straw and let that drive the switch? Love to hear more on converting contractors away from past less-effective methods.
- The training was very informative.
- Good mix of new and review; enjoyed the Caltrans segment and the videos and think poll questions are good for interactions.
- Good training overall.
- It was informative.
- Good work by all. Interesting erosion control discussion.

Do you have any ideas for topics for future trainings?

- Inspection of storm drains, marking inlets with emblems. A program where we can all use the same emblems.
- Provide the workshop itinerary ahead of the presentation so we can add notes during the workshop. I found myself taking notes and not being able to keep up with the slides.
- Practical measures of erosion control applications for land developments of mixed use.
- Maybe a lesser amount on compost socks. I concur they are more effective than wattles and in other uses as well, but the last few trainings have been heavy on the compost and light on others. Possible topics: better BMPs for stabilized construction entrance/exit as rumble strips don't really work well; street-sweeping, the types of sweepers and their effectiveness - some just smear it around and others actually work - why? These are some of the common BMPs encountered that aren't done well/perform well but technically are all the contractor is required to do to address tracking. A tire wash requirement is a last resort. What modifications will make a difference? That discussion I'm sure would be of interest to many.

Appendix 7

- Public Information and Participation Subcommittee – Attendance List– FY 2021/22
- Rain Barrel Outreach Program Survey Report
- Rain Barrel Outreach Program
 - Social Media posts and ads
 - Content Toolkit
 - Digital Newsletter
 - Shared Content by Community Partners
 - Example of Relevant Blogs
- Rain Garden Outreach Program
 - Flows To Bay webpage
 - Social Media Posts and ads
 - Digital Newsletter
- Blog Posts Examples and Metric Analytics
- Greening School Yards

Appendix 7

Appendix 7a: PIP Subcommittee Meeting Attendance

Public Information and Participation Subcommittee		FY 21-22	
AGENCY	NAME	10/5/2021	3/17/2022
C/CAG	Reid Bogert	x	x
Atherton	Nestor Delgado		
Atherton	Jacob Garcia		
Atherton	Ralph Robinson	x	
Belmont	Diane Lynn		
Belmont	Julie Freitas		
Brisbane	Shelley Romriell		
Brisbane	Keegan Black	x	
Burlingame	Jennifer Lee	x	x
Colma	Muneer Ahmed		
Colma	Kelly Carroll	x	x
Colma	Jeffrey Le		
Colma	Nick Zigler	x	
Daly City	Ward Donnelly		
Daly City	Sibely Calles	x	x
Daly City	Stephen Stolte		
East Palo Alto	Michelle Daher		
East Palo Alto	Jorge Luna		
East Palo Alto	June Canter		
Foster City	Taniela Mapa		x
Half Moon Bay	Mark Lander		
Half Moon Bay	Kelly Carroll	x	x
Half Moon Bay	Jeffrey Le		
Half Moon Bay	Veronika Vostinak		
Half Moon Bay	Colleen Lettire		
Half Moon Bay	Nick Zigler	x	
Hillsborough	Sara Bachmann	x	x
Menlo Park	Candice Almendral		
Menlo Park	Alexandria Skoch		

Menlo Park	Scott Jaw	x	x
Millbrae	Andrea Pappajohn	x	x
Pacifica	Yessika Dominguez		
Pacifica	Michelle Trayer	x	x
Pacifica	Kevin Sandberg (intern)		
Portola Valley	Ali Taghari		
Portola Valley	Brandi de Garmeaux		
Redwood City	Vicki Sherman	x	x
Redwood City	Christopher Fajikos		
Redwood City	Adrian Lee		
San Bruno	Jim Burch		
San Carlos	Vatsal Patel	x	x
San Mateo City	Gustavo Lopez		
San Mateo City	Sven Edlund	x	x
San Mateo City	Kellie Benz (Public Works)		
San Mateo City	Bradley Harms (Env Compliance)	x	x
San Mateo County	Aaron Francis		x
San Mateo County	Andrea Chow		
San Mateo County	Edelzar Garcia		
San Mateo County	Susan Wright		
San Mateo County	John Allan	x	x
San Mateo County	Kim Springer		
San Mateo County Health			
South San Francisco	Daniel Garza		
South San Francisco	Andrew Wemmer		
South San Francisco	Nelson Yuk	x	x
South San Francisco	Christina Tai		
Woodside	Dong Nguyen		
SGA	Suzi Senna	X	x
SGA	Paige Rosenberg	X	x
EOA	Peter Schultz-Allen	x	x
Caltrain	Carolyn Critz	x	x
BAWSCA	Kyle Ramey		x

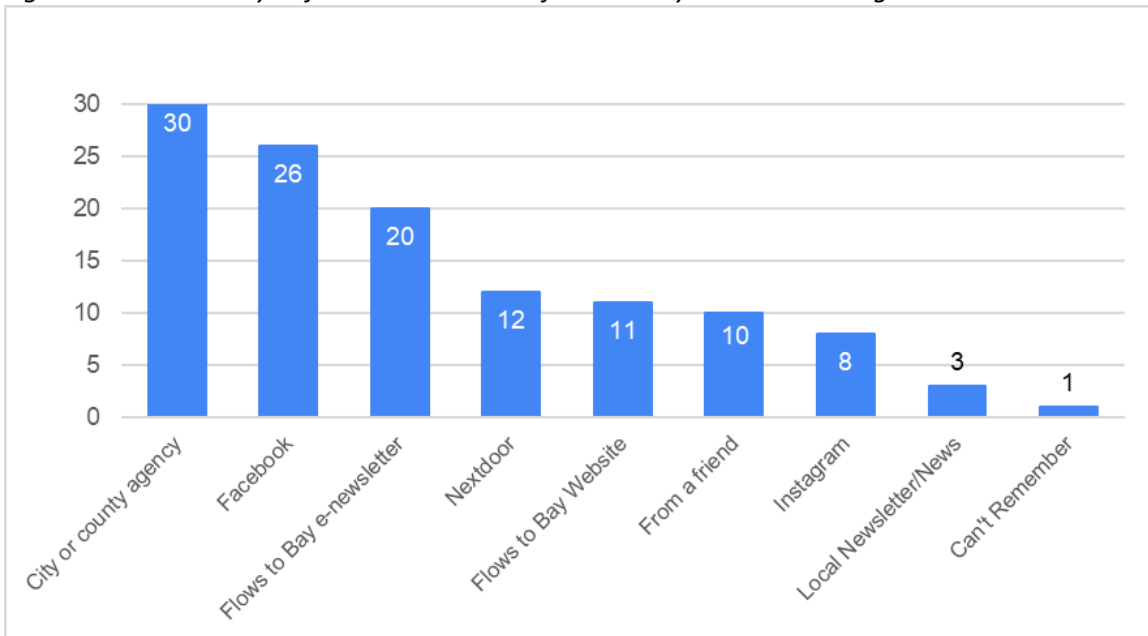
Appendix 7b: Rain Barrel Outreach Program Survey Report

The survey was sent to 395 individuals and received 148 responses. After removing duplicates (i.e. full responses from the same individual), 121 lines of response remained. However, any open responses that weren't reflected in both answers from the same individual were combined. Any suspicious responses and associated email addresses (potential spam/bot responses) were tested with <https://tools.emailhippo.com/>.

Program Awareness

As indicated in Figure 1, the majority of respondents first heard about the Flows to Bay Rain Barrel Program via one of three ways: a city or county agency (~25%), Facebook (~22%), or the Flows to Bay e-newsletter (~17%).

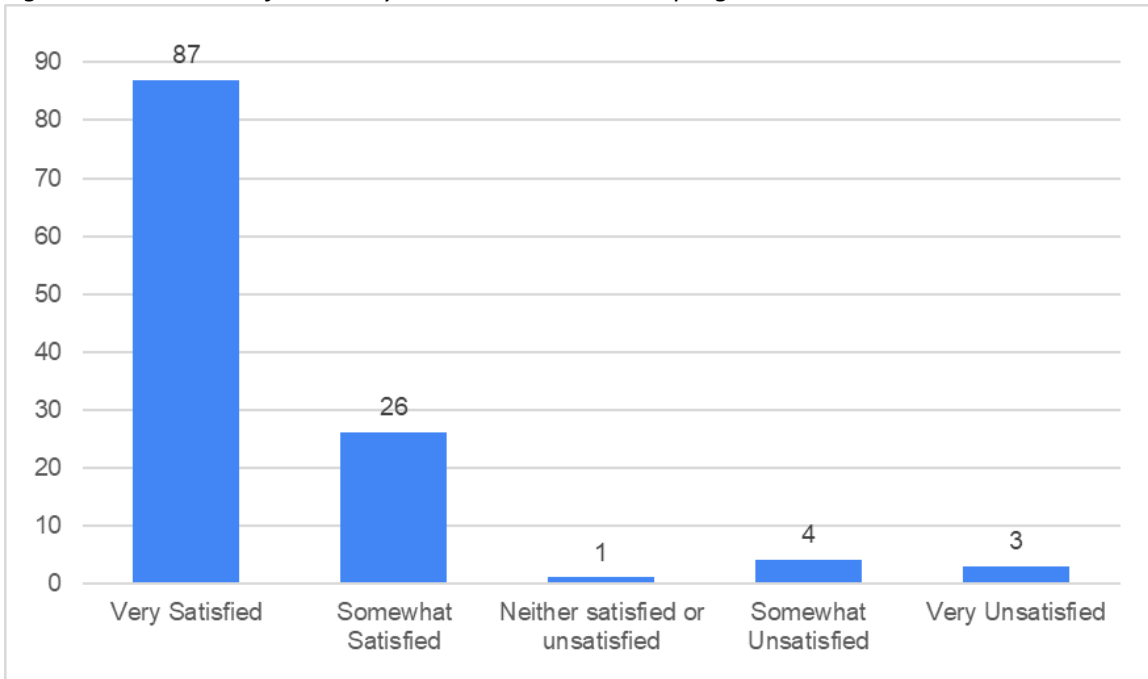
Figure 7b-1. How did you first hear about the flows to Bay Rain Barrel Program?



Resident Satisfaction with Program

Respondents were very satisfied with this rain barrel program, with 72% indicating that they were “very satisfied” and 21% indicating “somewhat satisfied.” Only 6% of respondents were either somewhat or very dissatisfied with the program.

Figure 7b-2. How satisfied were you with this rain barrel program?



Residents were given an opportunity to elaborate on their satisfaction or dissatisfaction as indicated in Figure 2. The majority of residents were pleased with the overall convenience of the program, while the highest concern area was the rebate process.

Positive comments were noted as follows:

- **Convenience:** 31 (26%) of respondents noted that the purchase and pickup process was seamless and convenient. 9 (7.4%) of respondents similarly commented that the installation process was easy.
- **Program assistance:** 16 (13%) of respondents were pleased with overall program communication materials, found the videos to be helpful, and noted that their questions were answered thoroughly and efficiently.
- **Rain barrels:** 12 respondents (10%) commented on the attractiveness and quality of the rain barrels.
- **Cost:** 10 (8%) participants said that the price of the rain barrels was great, especially when accounting for the rebate.

Participant concerns have been synthesized as follows:

- **Rebate process:** 14 (12%) respondents had concerns regarding the rebate timeline and overall responsiveness to questions regarding rebate questions.
 - 2 respondents were dealing with vague rebate eligibility with their local water district (i.e. County level vs local level rebates)
 - 3 respondents were confused with the rebate process (lost track of how to get one or online rebate process was glitchy)

- **Rain barrel build:** only 2 respondents had concerns regarding the rain barrel build.
 - 1 commented that they wish the valves were metal, not plastic
 - 1 had concerns regarding leaking, which may have been due to a fall
- **Rain barrel availability:** 4 respondents wish they could obtain more rain barrels
- **Installation:** 4 respondents had difficulty in installing their rain barrels.
 - 2 noted low response rate from contact list of installers
 - 1 was overwhelmed with installation process
 - 1 found directions to be unclear (not explaining that you may need to cut your rain gutters)

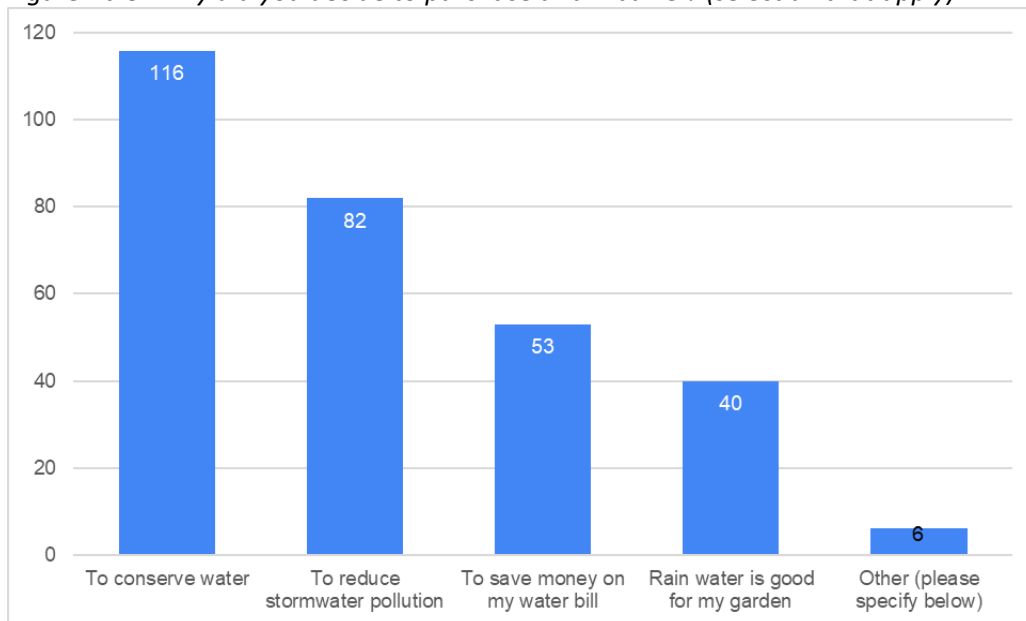
Motivators for Rain Barrel Purchase

Indicated in figure 3, the strongest motivators for residents is water conservation, with 96% of respondents indicating “to conserve water” as one of the reasons they purchased a rain barrel. Additionally, 68% of respondents noted that they purchased a rain barrel since “rain water is good for my garden.” Saving money ranked third in terms of motivators (44% of respondents), followed by reducing stormwater pollution (33%).

For those that responded with “other,” the following answers were provided:

- “To use a teaching tool for my classes”
- “Reinforce these important ideas for our family, including our young child that has an interest in waterways and loves the beach.”
- “We are installing a new gutter downspout, so we might as well add a rain barrel.”
- “Top off my fish pond”
- “Rebate”
- “To help reach a part of my yard that was difficult to water otherwise”

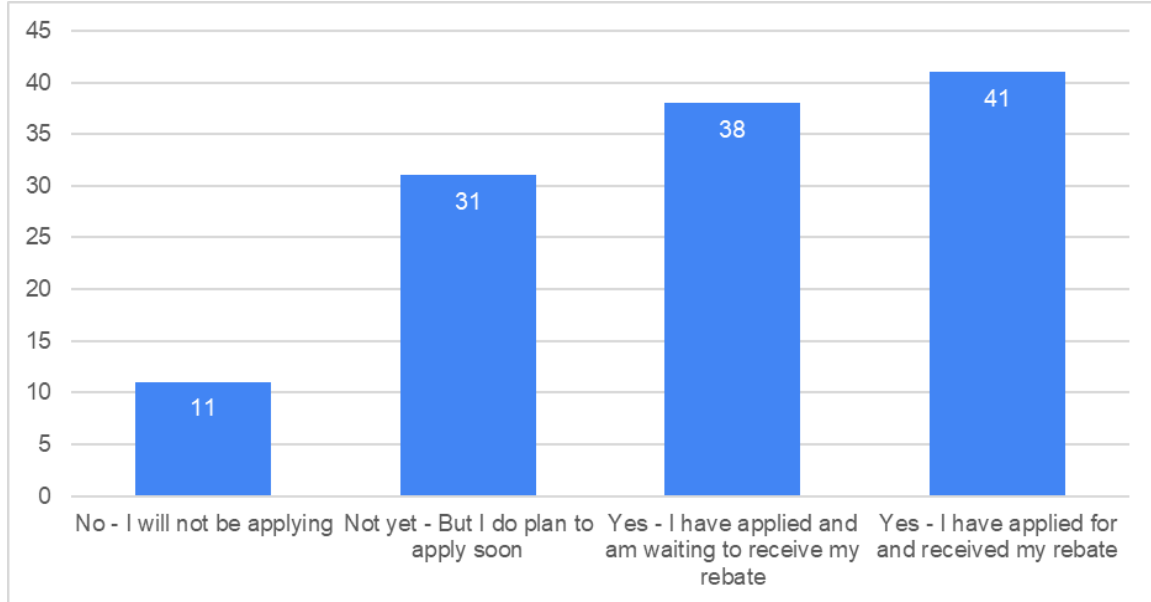
Figure 7b-3. Why did you decide to purchase a rain barrel? (select all that apply)



Rebate Application Process

65% of respondents have already applied for a BAWSCA rain barrel rebate for their purchased barrels, roughly half (52%) of which have already received their rebate and half of which are still awaiting their rebate. 26% of respondents plan to apply soon and 9% will not be applying.

Figure 7b-4. Have you applied for a BAWSCA rain barrel rebate for your purchased barrels?



Barriers to applying for a rebate were provided as follows

- 4 missed the deadline (and wishes application window was longer than 90 days)
 - 2 needed to provide photo of installed rain barrel and it has not yet been installed
- 2 didn't know how or lost information on how to apply
- 2 were not qualified for the rebate because
 - Barrel was not installed to collect roof water, or
 - Not planning to change downspout system (currently underground system)
- 1 wasn't aware of the rebate
- 1 lost receipt
- 1 didn't bother, (another noted that there was too much paperwork)

Additional Feedback Provided

Positive Feedback

- **Pickup Process:** 8 respondents commented on the ease in overall engagement process (i.e. from ordering to pickup) due to program organization
 - Ex; "The whole experience was terrific. Pick up was incredibly well organized and staffed with friendly people. I really hope this program becomes a regular thing, I have many more I want to purchase."

- **General:** 5 respondents were very appreciative of the program and how it allows residents to engage in the environmentally friendly practice of rainwater harvesting
 - Ex; “Loved this program. I want to make changes to my environmental impact, but sometimes all the information out there can be overwhelming. This was a simple way to make a dent in my water usage.”
 - Ex; “Thanks for offering this. It made it easier than shopping for different barrels and having to do research to find the right one and how to install it.”
- **Incentive:** 8 respondents commented on how the rebate was a great incentive and overall benefits of the program outweighed any associated costs in participating.
 - Ex; “Thanks for this wonderful program! I've always wanted to get rain barrels and this was the impetus I needed. Plus the rebate helps make it affordable.”
 - Ex; “The barrels are a bit more expensive than a DIY project, but because the barrels are attractive, narrow, and come with all the supplies, the benefits outweigh the initial cost.”
- **Installation:** 3 respondents commented on the ease of installation, particularly with the provided educational materials
 - Ex; “Having the video really helped setting up the rain barrel.”

Constructive Feedback

Installation: 6 comments referred to the installation process. In particular, residents were concerned about replacing or cutting gutters, varying gutter pieces, and different downspouts – and having information on how to handle these issues. Respondents expressed interest in having more educational materials and potentially sharing experiences/photos with one another.

- Ex; “we need to replace some/all? of our gutters... but I've not found anyone local available to fix gutters in a timely manner.”
- Ex; “Though the installation instructions provided via Flows To Bay website were helpful, not all downspouts are made the same style, shape, and size.”

Opportunities to Share information: sharing participant photos, creating a team, workshops

- Ex; “It might be helpful to provide a few DIY diverter ideas and/or post photos from those who participated in the program.”
- Ex; “We may create a team and share the experience with other people. I believe still a lot of people do not know how to install or are afraid of installing by themselves like me.. if we can have more workshops it will be nice too.”
- Ex; “a lot more people would use it if they knew about it. Someone in my neighborhood posted his barrel project on nextdoor.com and had dozens of people thanking him for the information.”

Rebate Process: 15 respondents commented on the rebate process, including issues with the online application, clarity on process, and the delay/timeline in obtaining their rebate. Respondents expressed interest in greater assistance with the online process, clarification on

eligibility, an extended application window, and a way of accessing rebate status. Furthermore, interest was expressed in having the rebate automatically be applied to the rain barrels.

Online Application

- Ex; “I wanted to apply for a rebate and was unsuccessful online. Requested help from multiple people and never received it.”
- Ex; “The Bawsca website had bugs - wasn’t able to set up an account after signing in. Had to send an email to Droplet people nor was there a straightforward way to contact someone to help... Make it user friendly if you want more people to participate and benefit from the program.”

Clarification on Process/Eligibility

- Ex; “Received part of rebate from Millbrae water but called and told that the State would also send part of the rebate. Would've appreciated knowing that”
- Ex; “I was surprised that I was only eligible for the Pilot Program rebate since my San Mateo CalWater is not a participating agency.”
- Ex; “Vague info to clarify water organization eligibility (website could be more clear on Cal Water for San Carlos residents).”

Rebate Process Logistics

- Ex; “It would be nice to receive an email or text indicating that my rebate is being processed.”
- Ex; “Please make the window to apply for the rebate longer.”
- Ex; “It would be nice if the rebate is automatically applied to reduce paperwork and make it more appealing”

Number of rain barrels/rebates: 4 residents commented that they would like greater availability of rain barrels and accompanying rebates.

- Ex; “Would like to have the same rebate available for 2 more barrels per address!”
- Ex; “Would like to have more barrels and maybe a little more affordable price.”

Rain Barrels: only 2 residents commented on the physical nature of the rain barrels

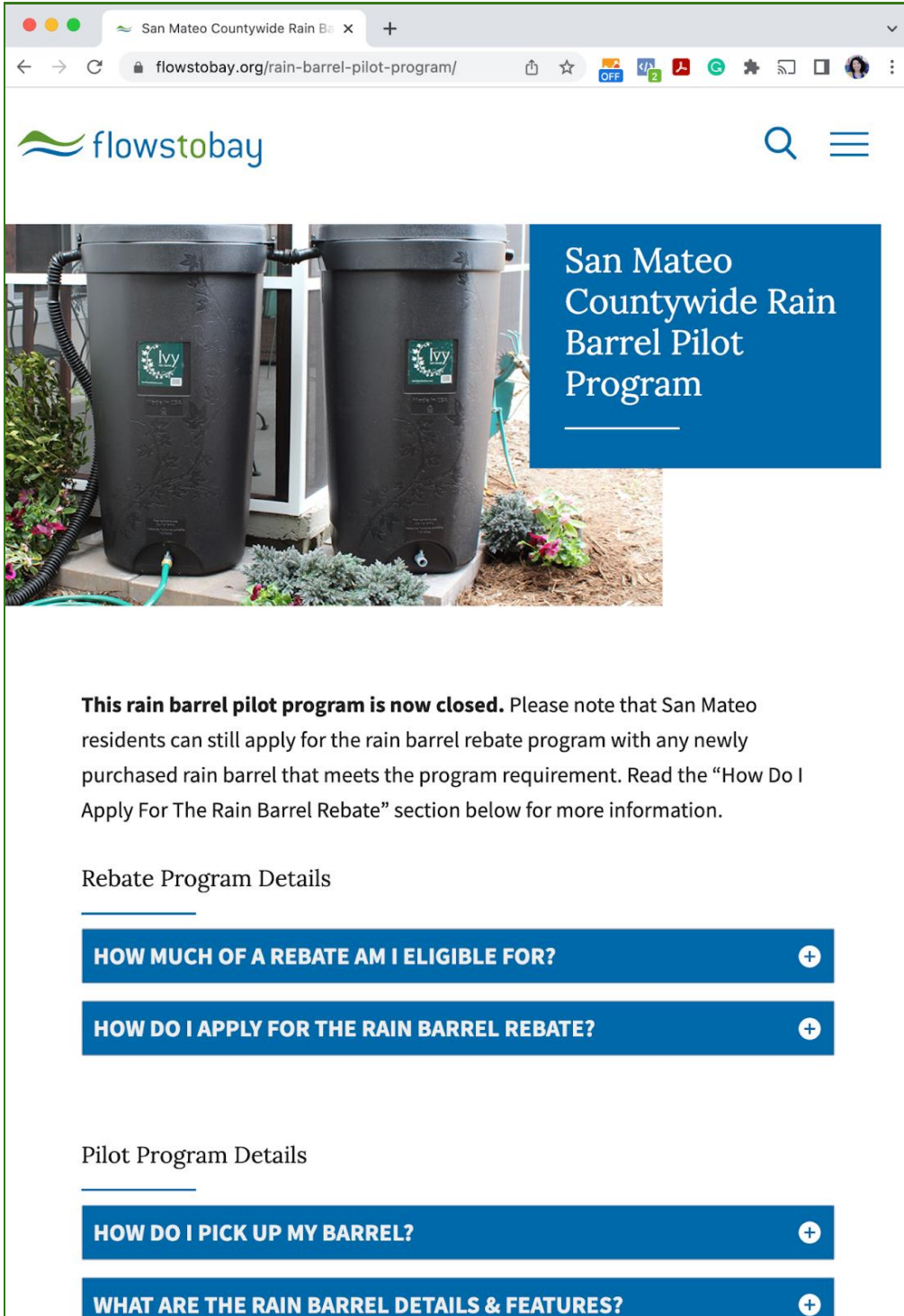
- “I just think it would be great to go with bigger containers”
- “Need to get another part (plug) for the bottom of one barrel which leaks.”

Miscellaneous Feedback

- **Pickup:** “One thing I wish could have been done is the pickup whenever you are available vs via last name time slot.”
- **Program Timing:** “Please consider doing the program prior to the rainy season July-Aug ready for Oct.”
- **Referral Incentives:** “Instead of spending on advertising the program, maybe offering incentives for the referrals might help too.”
- **Access to Information:** “I had a hard time finding my old email with the video tutorial showing how to set up the rain barrels... Another link to that video would have been helpful in the subsequent email reminders...”

Appendix 7c: Rain Barrel Outreach Program

Figure 7c-1. Rain Barrel Outreach Program – Flows To Bay Webpage



San Mateo Countywide Rain Barrel Pilot Program

This rain barrel pilot program is now closed. Please note that San Mateo residents can still apply for the rain barrel rebate program with any newly purchased rain barrel that meets the program requirement. Read the “How Do I Apply For The Rain Barrel Rebate” section below for more information.

Rebate Program Details

- HOW MUCH OF A REBATE AM I ELIGIBLE FOR?
- HOW DO I APPLY FOR THE RAIN BARREL REBATE?

Pilot Program Details

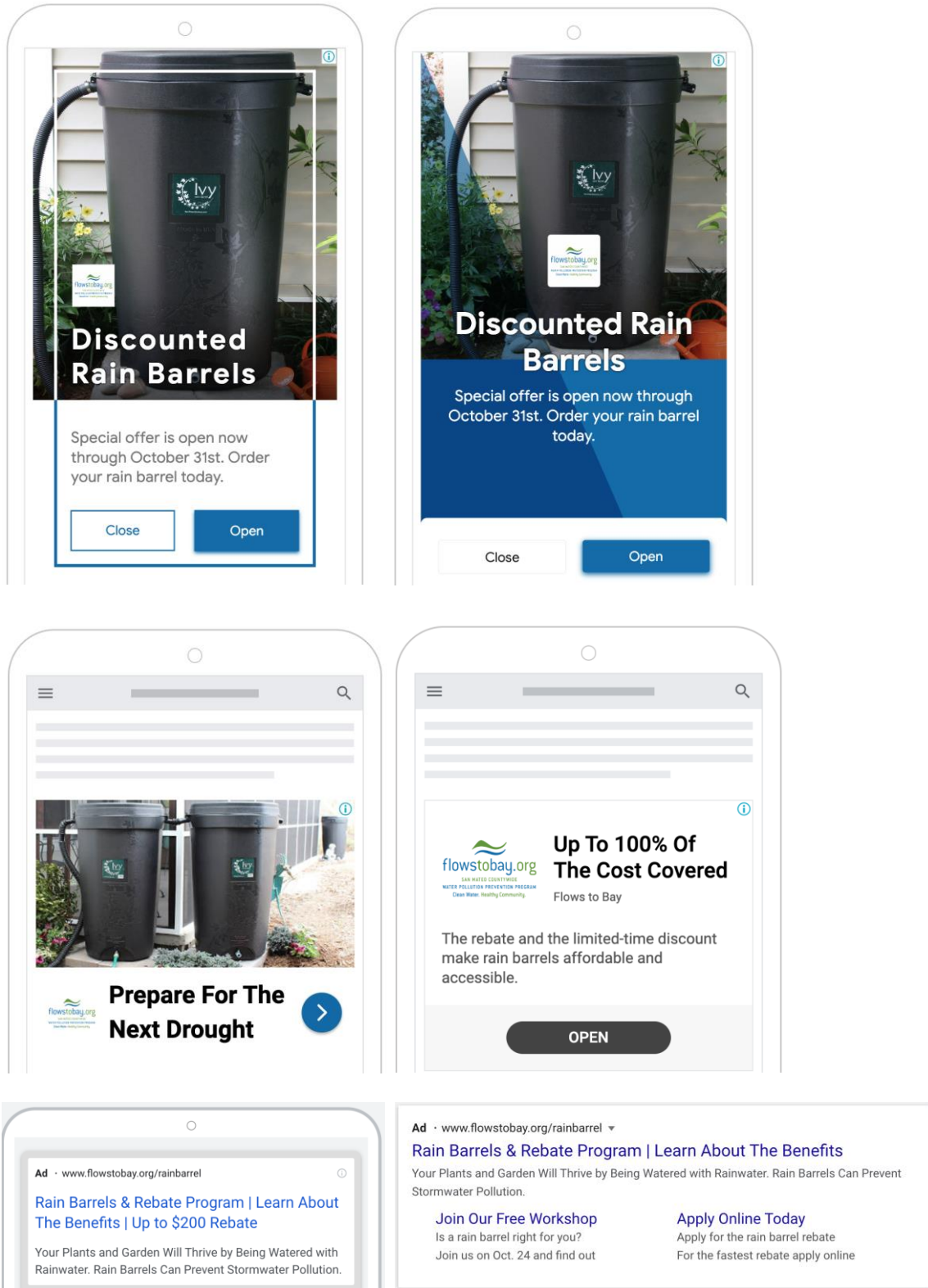
- HOW DO I PICK UP MY BARREL?
- WHAT ARE THE RAIN BARREL DETAILS & FEATURES?

Figure 7c-2. Rain Barrel Outreach Program – RainWater Solution e-Commerce Site



The screenshot shows a web browser window with the URL <https://www.rainwatersolutions.com/products/smc/>. The page title is "San Mateo Countywide Rain Barrel Pilot Program". Below the title is a blue circular icon with a water drop. To the left is a photograph of a black 50-gallon Ivy Rain Barrel. To the right of the photo, the text reads: "Purchase your Classic Black 50 gallon Ivy Rain Barrel for \$80.00 each. Limit 2 barrels per purchase. All sales final. Qualifying applicants can also apply for the countywide rebate. Learn more here." Below this is a red "SOLD OUT" notice: "SOLD OUT. Please add your name to the [waitlist](#) and be notified when a new sale is scheduled." This is followed by an "IMPORTANT - PLEASE READ" section: "All purchased rain barrels through this program MUST be picked up during the distribution event taking place on Saturday, January 29, 2022, from 9 am to 12 pm at [Lyngso Garden Materials in San Carlos](#). There will NOT be an alternative pick-up date, time, or location. The rain barrel will NOT be shipped to you." A green deadline notice states: "Deadline to order is Sun., Jan. 16th at 11pm PST or until supplies last." At the bottom, a light blue box contains the pickup details: "Pickup: Saturday, January 29, 2022 9:00 am to 12:00 pm" and an "Add to Calendar" button.

Figure 7c-3. Rain Barrel Outreach Program - Google Responsive Display, Text, and Search Ads



The figure displays six mobile device screens illustrating different ad formats for the Rain Barrel Outreach Program:


- Top Left (Responsive Display Ad):** Shows a single black rain barrel with the 'Ivy' logo. Text reads: "Discounted Rain Barrels". Below the image, it says: "Special offer is open now through October 31st. Order your rain barrel today." Buttons for "Close" and "Open" are at the bottom.
- Top Right (Responsive Display Ad):** Shows a single black rain barrel with the 'Ivy' logo. Text reads: "Discounted Rain Barrels". Below the image, it says: "Special offer is open now through October 31st. Order your rain barrel today." Buttons for "Close" and "Open" are at the bottom.
- Middle Left (Responsive Display Ad):** Shows two black rain barrels. Text reads: "Prepare For The Next Drought" with a blue arrow button.
- Middle Right (Text Ad):** Features the 'flowstobay.org' logo and text: "Up To 100% Of The Cost Covered". Below, it says: "The rebate and the limited-time discount make rain barrels affordable and accessible." An "OPEN" button is at the bottom.
- Bottom Left (Search Ad):** Shows the ad title: "Rain Barrels & Rebate Program | Learn About The Benefits | Up to \$200 Rebate". The description reads: "Your Plants and Garden Will Thrive by Being Watered with Rainwater. Rain Barrels Can Prevent Stormwater Pollution."
- Bottom Right (Search Ad):** Shows the ad title: "Rain Barrels & Rebate Program | Learn About The Benefits". The description reads: "Your Plants and Garden Will Thrive by Being Watered with Rainwater. Rain Barrels Can Prevent Stormwater Pollution." Below are two call-to-action buttons: "Join Our Free Workshop" (with subtext "Is a rain barrel right for you? Join us on Oct. 24 and find out") and "Apply Online Today" (with subtext "Apply for the rain barrel rebate For the fastest rebate apply online").

Figure 7c-4. Rain Barrel Outreach Program – Social Media Posts and Ads

Flows To Bay
January 9 · 🌱

Stacie is a San Mateo resident who bought two rain barrels from our Rain Barrel Pilot program. She plans to use them to capture rainwater and store it to water her beautiful rose garden with in the summer.


Read more about Stacie's rain barrel journey here: <https://bit.ly/blog-stacie>



Flows To Bay
November 15 · 🌱

This weekend we distributed 330 rain barrels to San Mateo County residents. That adds up to a capacity to capture 16,500 gallons of rainwater for every 1/8 of an inch of rain falling on a 500 square foot roof area. That's a lot of water conservation and pollution prevention!

A huge thanks to our partner **The City of San Mateo Public Works** for making this rain barrel event a success!



Flows To Bay
Sponsored · 🌱

Big Announcement Alert 📢 For a limited-time, San Mateo County residents and business owners have the opportunity to purchase up to two high-quality 50-gallon barrels for \$80 each. Qualifying rain barrel rebate applicants can get up to 100% of the cost reimbursed (pre-tax)! Get the details here: <https://www.flowstobay.org/rain-barrel-pilot-program/>


Save Water

Reduce Water Bills

Prevent Pollution

Order your rain barrel online by **October 31, 2021.**

Pick up in person on **November 13, 2021**



Barriles de lluvia de 50 galones de alta calidad por \$80 (antes de impuestos o reembolso)

Haga su pedido en línea antes del **16 de enero.**

Recójalo en persona el **29 de enero.**

[flowstobay.org](https://www.flowstobay.org)




Figure 7c-5. Rain Barrel Outreach Program – Content Toolkit Distribute To Partner Agencies & Organizations ([Material Link Here](#))

COMMUNICATIONS CONTENT

SAN MATEO COUNTYWIDE RAIN BARREL PILOT PROGRAM

[Flows To Bay](#), in partnership with [Rain Water Solutions](#), has rolled out a limited-time pilot rain barrel program. With this program, San Mateo County residents and businesses can purchase up to two high-quality, 50-gallon rain barrels for a cost of \$80 each. Qualifying applicants can also apply for the countywide rebate, which can cover up to 100% of the per-barrel price (pre-tax).

Using this toolkit, you can share this rain barrel program opportunity with your community. The toolkit includes:

- An FAQ sheet
- Ready-to-use Facebook and Instagram posts
- Ready-to-use newsletter content

How to use this toolkit: Copy and paste the text provided and download the images to use.



[Downloadable Images Can Be Found Here](#)



FAQ SHEET

HOW DO I PURCHASE A RAIN BARREL WITH THIS PILOT?

Rain barrels can be purchased securely online through the [Rain Water Solutions site](#) via credit card. Purchases can be made through January 16, 2022 or until supplies last. There is a limit of 2 rain barrels per purchase.

[Purchase a Rain Barrel Here](#)

HOW DO I PICK UP MY BARREL?

All purchased rain barrels must be picked up during the distribution event taking place on Saturday, January 29, 2022, from 9 am to 12 pm. The rain barrel will NOT be shipped to you.

The pickup location will be [Lyngso Garden Materials in San Carlos](#). The rain barrels will fit in the backseat of most 4-door sedans or hatchbacks and can be nested to fit 2 barrels. Each rain barrel weighs 16 pounds when empty. [Learn More About Picking Up Your Rain Barrel Here](#)

WHAT ARE THE RAIN BARREL DETAILS & FEATURES?

The Ivy rain barrel comes with everything you need to assemble, collect, and use rainwater. Barrels can easily be connected together with no added cost. All components are included with the purchase price:

- 50-gallon barrel
- 6' overflow hose
- locking child-proof lid
- 3/4" HDPE ball valve

HOW DO I INSTALL THE RAIN BARREL?

Download a printed version of the [installation instructions here](#) or watch [this short 6 minutes video](#) to learn how to install the Ivy Rain Barrel.

WHAT ARE THE BENEFITS OF OWNING A RAIN BARREL?

The benefits of owning a rain barrel include:

1. Allowing you to water your garden with rainwater, which is better for your plants because it is free of the additives that go into tap water.
2. Moderating flooding and decreasing erosion in your yard during the rainy season.
3. Protecting local creeks, the San Francisco Bay, and the Ocean by reducing urban runoff that transports litter, motor oil, and other pollutants into storm drains.

HOW MUCH OF A REBATE AM I ELIGIBLE FOR?

All San Mateo County residents are eligible for up to two \$50 rebates on rain barrels sized 50-99 gallons. Customers of the below 9 water districts are eligible for up to two \$100 rebates on barrel sized 50-99 gallons. (Rebate is for \$100 or the total cost of the rain barrel, excluding sales tax, whichever is less.)

[Answer 3 Quick Questions To Find Out How Much of a Rebate You're Eligible For](#)

Participating Water Districts


Limit of two rebates per single-family residential account or four rebates per multi-family resident or commercial account. Rebate amounts for residents of the cities of Brisbane/Guadalupe Valley MID, Burlingame, Daly City, Menlo Park, Millbrae, Redwood City, and San Mateo as well as residents services by the Mid-Peninsula Water District and North Coast County Water District.

HOW DO I APPLY FOR THE RAIN BARREL REBATE?

Review the [rebate requirements checklist](#), and once all the items are done, you can [apply for your rebate here](#).

Figure 7c-6. Rain Barrel Outreach Program – Digital Newsletter Example


View this email in your browser



flowstobay.org
SAN MATEO COUNTYWIDE WATER POLLUTION PREVENTION PROGRAM
Clean Water. Healthy Community.

Our Discounted Rain Barrel Pilot Program Is Back

Rain Barrel Pilot Program | Rain Barrel Installation Workshop | Rain Garden Installation



Rain Barrel Pilot Program

We are excited to announce that we are bringing back our very successful Rain Barrel Pilot Program for a limited time! San Mateo County residents once again have the opportunity to purchase up to two high-quality 50-gallon barrels for \$80 each. This is a significant discount from the barrel's \$130 **retail value**.

Additionally, San Mateo County residents may qualify for a rebate that can cover up to 100% of the barrel cost (pre-tax). You can find out how much of a rebate you qualify for and program details **[on our website](#)**.

Sign-ups are open until Jan. 16 or while supplies last. Once you place an order, you will need to pick up your rain barrel(s) on Saturday, January 29, 2022, between 9 am and 12 pm at **[Lyngso Garden Materials](#)** in San Carlos. There will not be an alternative pick-up date, time, or location and the rain barrel can not be shipped to you.

Learn How To Save Here

Figure 7c-7. Rain Barrel Outreach Program – Shared Content by Community Partners

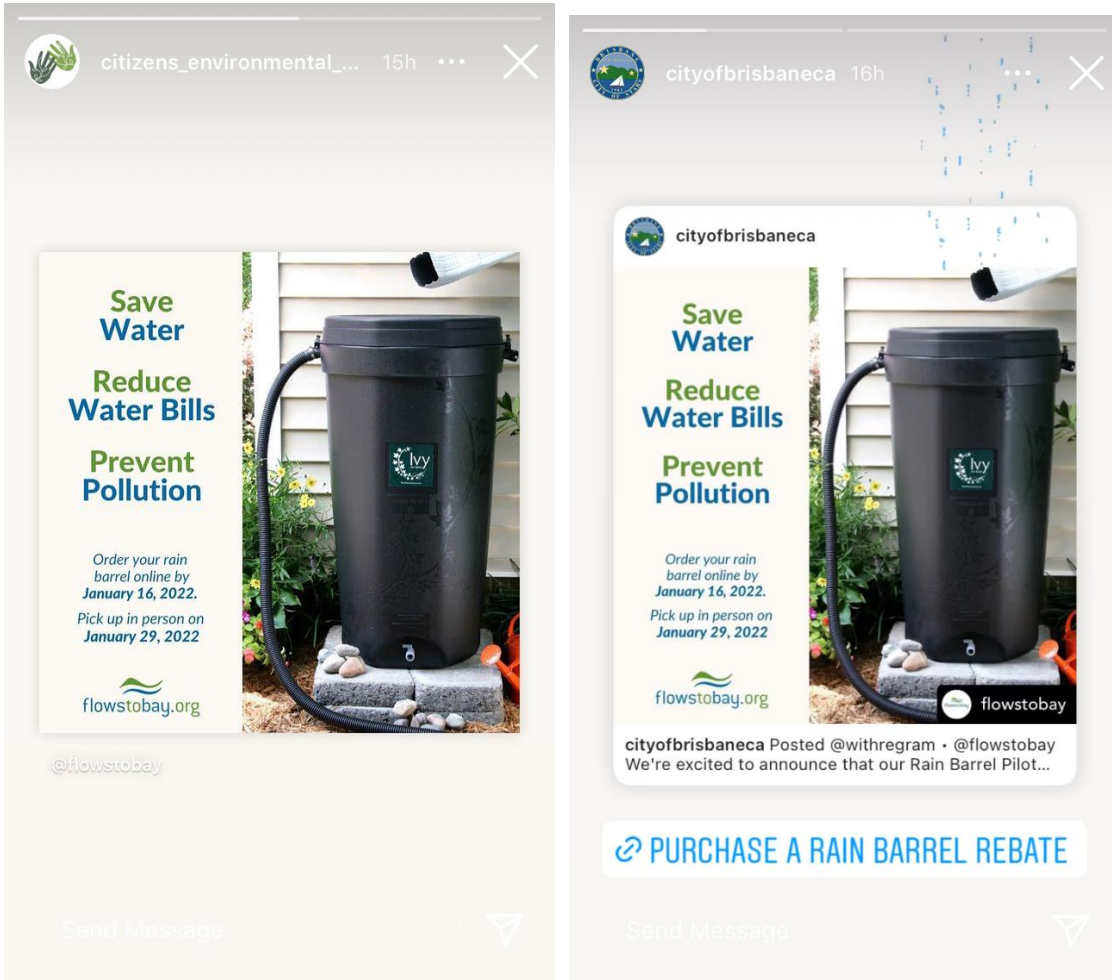
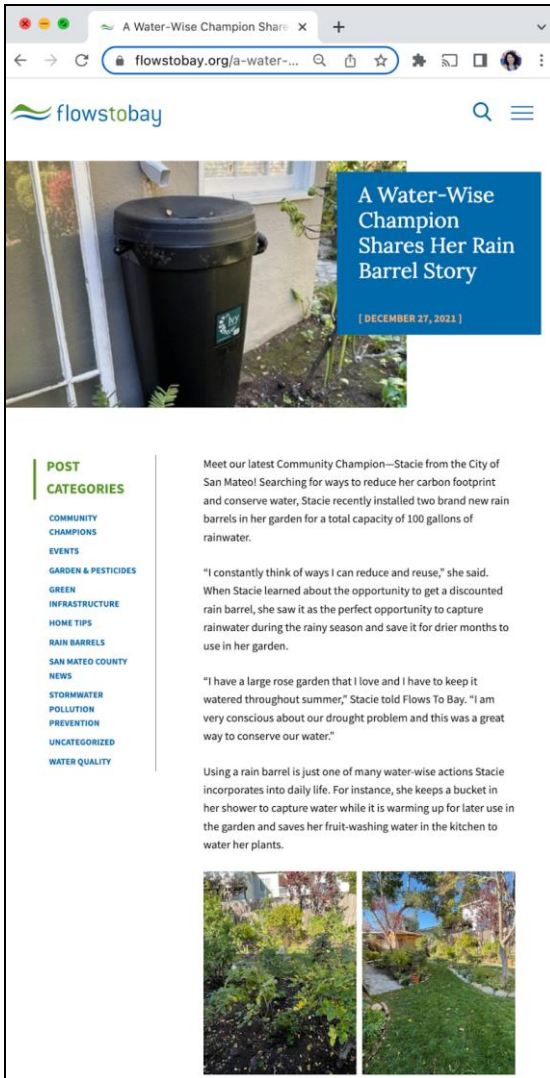


Figure 7c-8. Rain Barrel Outreach Program – Example of Relevant Blogs



A Water-Wise Champion Shares Her Rain Barrel Story
[DECEMBER 27, 2021]

POST CATEGORIES


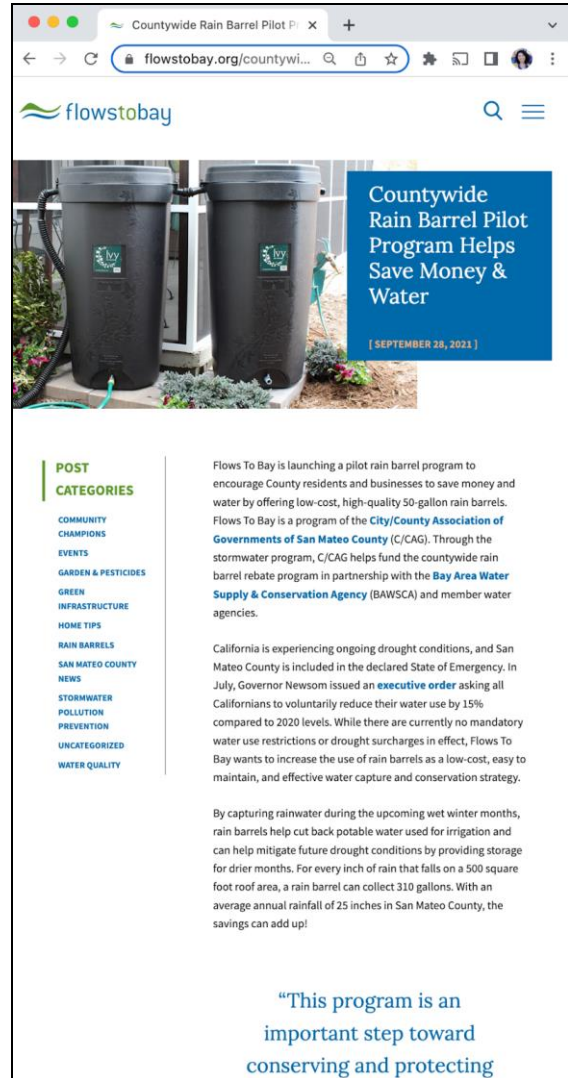
- COMMUNITY CHAMPIONS
- EVENTS
- GARDEN & PESTICIDES
- GREEN
- INFRASTRUCTURE
- HOME TIPS
- RAIN BARRELS
- SAN MATEO COUNTY NEWS
- STORMWATER
- POLLUTION PREVENTION
- UNCATEGORIZED
- WATER QUALITY

Meet our latest Community Champion—Stacie from the City of San Mateo! Searching for ways to reduce her carbon footprint and conserve water, Stacie recently installed two brand new rain barrels in her garden for a total capacity of 100 gallons of rainwater.

"I constantly think of ways I can reduce and reuse," she said. When Stacie learned about the opportunity to get a discounted rain barrel, she saw it as the perfect opportunity to capture rainwater during the rainy season and save it for drier months to use in her garden.

"I have a large rose garden that I love and I have to keep it watered throughout summer," Stacie told Flows To Bay. "I am very conscious about our drought problem and this was a great way to conserve our water."

Using a rain barrel is just one of many water-wise actions Stacie incorporates into daily life. For instance, she keeps a bucket in her shower to capture water while it is warming up for later use in the garden and saves her fruit-washing water in the kitchen to water her plants.

Countywide Rain Barrel Pilot Program Helps Save Money & Water
[SEPTEMBER 28, 2021]

POST CATEGORIES

- COMMUNITY CHAMPIONS
- EVENTS
- GARDEN & PESTICIDES
- GREEN
- INFRASTRUCTURE
- HOME TIPS
- RAIN BARRELS
- SAN MATEO COUNTY NEWS
- STORMWATER
- POLLUTION PREVENTION
- UNCATEGORIZED
- WATER QUALITY

Flows To Bay is launching a pilot rain barrel program to encourage County residents and businesses to save money and water by offering low-cost, high-quality 50-gallon rain barrels. Flows To Bay is a program of the **City/County Association of Governments of San Mateo County (C/CAG)**. Through the stormwater program, C/CAG helps fund the countywide rain barrel rebate program in partnership with the **Bay Area Water Supply & Conservation Agency (BAWSCA)** and member water agencies.

California is experiencing ongoing drought conditions, and San Mateo County is included in the declared State of Emergency. In July, Governor Newsom issued an **executive order** asking all Californians to voluntarily reduce their water use by 15% compared to 2020 levels. While there are currently no mandatory water use restrictions or drought surcharges in effect, Flows To Bay wants to increase the use of rain barrels as a low-cost, easy to maintain, and effective water capture and conservation strategy.

By capturing rainwater during the upcoming wet winter months, rain barrels help cut back potable water used for irrigation and can help mitigate future drought conditions by providing storage for drier months. For every inch of rain that falls on a 500 square foot roof area, a rain barrel can collect 310 gallons. With an average annual rainfall of 25 inches in San Mateo County, the savings can add up!

"This program is an important step toward conserving and protecting"

Appendix 7d: Rain Garden Outreach Program

Figure 7d-1. Rain Garden Outreach Program – Flows To Bay Webpage



The screenshot shows the 'flowstobay' website. At the top, there is a navigation bar with the logo and links for 'English / Español / 中文 / Tagalog', 'Events Calendar', 'Contact', 'Blog', 'Search', and social media icons for Facebook, YouTube, and Instagram. Below the navigation bar is a secondary menu with links: 'ABOUT FLOWS TO BAY', 'PREVENTING STORMWATER POLLUTION', 'DATA & RESOURCES', 'GET INVOLVED', and 'PERMITTEES'. The main content area features a large image of a rain garden in front of a house. Overlaid on the right side of this image is a blue banner with the text: 'Rain Gardens & Rebate Program', 'Rain gardens are an elegant way to capture rain water on your property and prevent stormwater pollution.', and 'Read on to learn more.' Below the main image, there is a sidebar on the left titled 'ON THIS PAGE' with a list of links: 'What Is A Rain Garden?', 'Rain Garden Before & After', 'Rain Gardens 101 Video Series', 'Rain Garden Rebate – Part of the Lawn Be Gone! Lawn Conversion Rebate Program', and 'Resources & Sample'. To the right of the sidebar is a section titled 'What Is A Rain Garden?' with a sub-header and a paragraph: 'A rain garden is a shallow landscaped depression that captures, cleans, and absorbs rainwater from a roof, driveway or street. This practice mimics natural hydrology by infiltrating and evapotranspiring stormwater runoff as it collects and moves through a rain garden.' Below the text is a small illustration of a rain garden with the text 'Native or climate-adapted plants'.

Figure 7d-2. Rain Garden Outreach Program – Social Media Posts and Ads


Flows To Bay is in **San Mateo County**.
Published by Social Marketing · February 5 ·

InMenlo published an article about the rain garden that we helped install at Belle Haven Elementary School in December! The rain garden will help make the school greener as well as capture and filter stormwater during rainy months.
Read it here: bit.ly/inmenlo-rain-garden



INMENLO.COM
Belle Haven Elementary receives new rain garden - InMenlo
By using specially designed vegetated areas, rain gardens are a great way to...

flowstobay
San Mateo County



0:27

- Use plants that will bloom at various times of the year.
- Add California native plants to compatible non-native plants
- Experiment with plants that are native to your specific location
- Focus on resiliency – try plants that may be more adaptable to the warming temperatures of climate change (Australia/New Zealand/CA Central Valley and Desert)

Designing for biodiversity: plants


39 views

flowstobay One benefit of rain gardens is that native plants thrive in them! Check out this video where Haven Kiers, Assistant Professor at UC Davis, describes how to incorporate native plants into a rain garden.

Check out our website to learn about our Rain Garden Rebates: bit.ly/Rain-Garden-Rebate

#raingarden #gardening #drought #nativeplants #sanmateocounty
December 17, 2021

flowstobay
San Mateo County



What is a Rain Garden?

Rain gardens are beautiful, useful, and easy to maintain lowered spots of landscape where stormwater runoff collects. Rocks and native or climate-adapted plants help filter the water. This results in cleaner runoff, which is better for the environment and can lower the risk of local flooding.

flowstobay.org

12 likes

flowstobay Get \$300 towards your new landscaping project with the Lawn Be Gone! Rebate program. You can replace a water-guzzling lawn with a beautiful, drought-friendly rain garden.

Learn more here: bit.ly/Rain-Garden-Rebate
October 13, 2021

flowstobay
San Mateo County



**Rain Gardens 101:
How to Design, Build,
and Maintain a
Rain Garden**

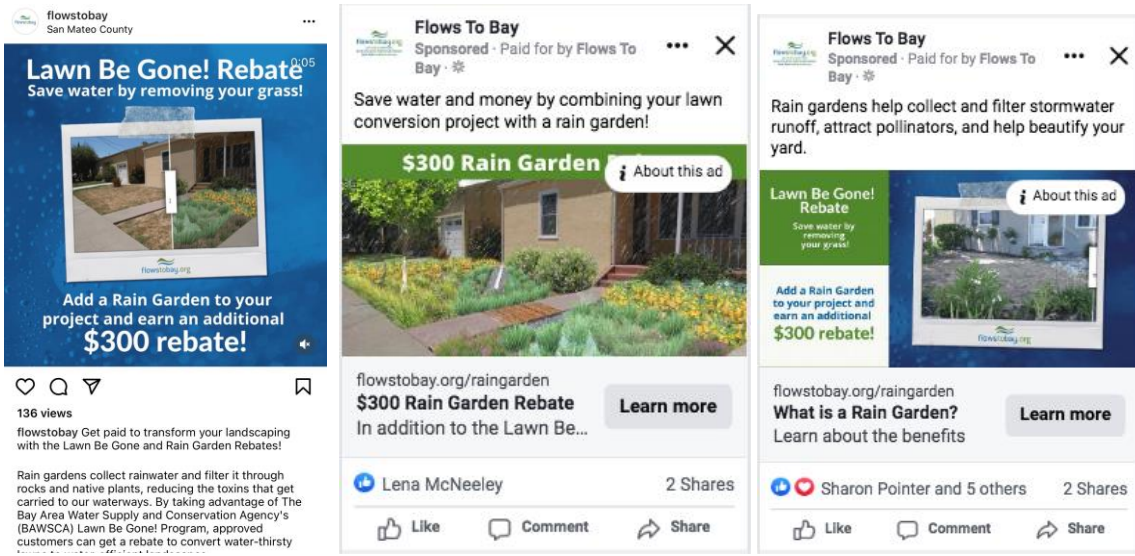
SATURDAY, OCT. 23 @ 10 AM
FREE ZOOM WEBINAR

flowstobay.org

11 likes

flowstobay Interested in building a rain garden in your yard but don't know where to start? Join us on October 23 for a workshop on the basics of rain garden design, implementation, and maintenance! Plus, one lucky attendee will win a \$100 gift card to their choice of Home Depot, Hassett Ace Hardware, or Lyngso Garden Materials.

Register today: <https://bit.ly/Oct-rain-garden-webinar>



flowstobay
San Mateo County

Lawn Be Gone! Rebate
Save water by removing your grass!
Add a Rain Garden to your project and earn an additional **\$300 rebate!**

136 views
flowstobay Get paid to transform your landscaping with the Lawn Be Gone and Rain Garden Rebates!
Rain gardens collect rainwater and filter it through rocks and native plants, reducing the toxins that get carried to our waterways. By taking advantage of The Bay Area Water Supply and Conservation Agency's (BAWSCA) Lawn Be Gone! Program, approved customers can get a rebate to convert water-thirsty lawns to rain gardens.

Flows To Bay
Sponsored · Paid for by Flows To Bay
Save water and money by combining your lawn conversion project with a rain garden!
\$300 Rain Garden Rebate
In addition to the Lawn Be...

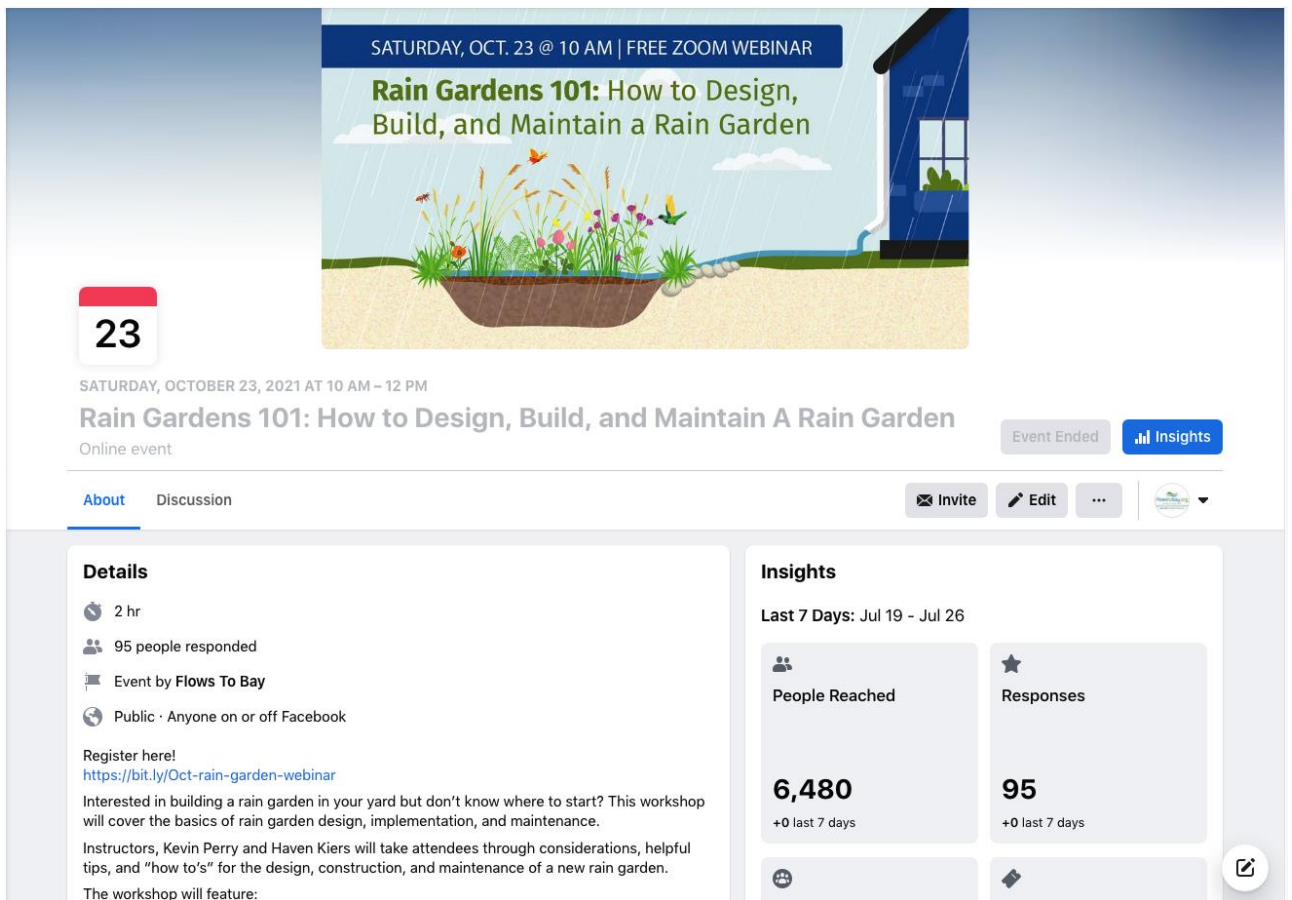
flowstobay.org/raingarden
\$300 Rain Garden Rebate
Learn more

Lena McNeeley 2 Shares
Like Comment Share

Flows To Bay
Sponsored · Paid for by Flows To Bay
Rain gardens help collect and filter stormwater runoff, attract pollinators, and help beautify your yard.
What is a Rain Garden?
Learn about the benefits

flowstobay.org/raingarden
What is a Rain Garden?
Learn more

Sharon Pointer and 5 others 2 Shares
Like Comment Share



SATURDAY, OCT. 23 @ 10 AM | FREE ZOOM WEBINAR

Rain Gardens 101: How to Design, Build, and Maintain a Rain Garden

23

SATURDAY, OCTOBER 23, 2021 AT 10 AM - 12 PM

Rain Gardens 101: How to Design, Build, and Maintain A Rain Garden
Online event

Event Ended Insights

About Discussion

Invite Edit ...

Details

- 2 hr
- 95 people responded
- Event by **Flows To Bay**
- Public · Anyone on or off Facebook

Register here!
<https://bit.ly/Oct-rain-garden-webinar>

Interested in building a rain garden in your yard but don't know where to start? This workshop will cover the basics of rain garden design, implementation, and maintenance.

Instructors, Kevin Perry and Haven Kiers will take attendees through considerations, helpful tips, and "how to's" for the design, construction, and maintenance of a new rain garden.

The workshop will feature:

Insights

Last 7 Days: Jul 19 - Jul 26

People Reached	Responses
6,480	95
+0 last 7 days	+0 last 7 days

Figure 7d-3. Rain Garden Outreach Program – Digital Newsletter Example



SATURDAY, OCT. 23 @ 10 AM | FREE ZOOM WEBINAR

Rain Gardens 101: How to Design, Build, and Maintain a Rain Garden

The start of the rainy season means this is the perfect time to install a new rain garden. Rain gardens are beautiful landscape features that collect and filter rainwater, reducing the toxins that get carried to our waterways.

If you're interested in building a rain garden but don't know where to start—this webinar is for you! Instructors, Kevin Perry and Haven Kiers will take attendees through considerations, helpful tips, and "how to's" for the design, construction, and maintenance of a new rain garden. The presentation will be approximately two hours with a Q&A session to follow, so bring your questions on **Saturday, October 23, 2021 starting at 10 AM.**

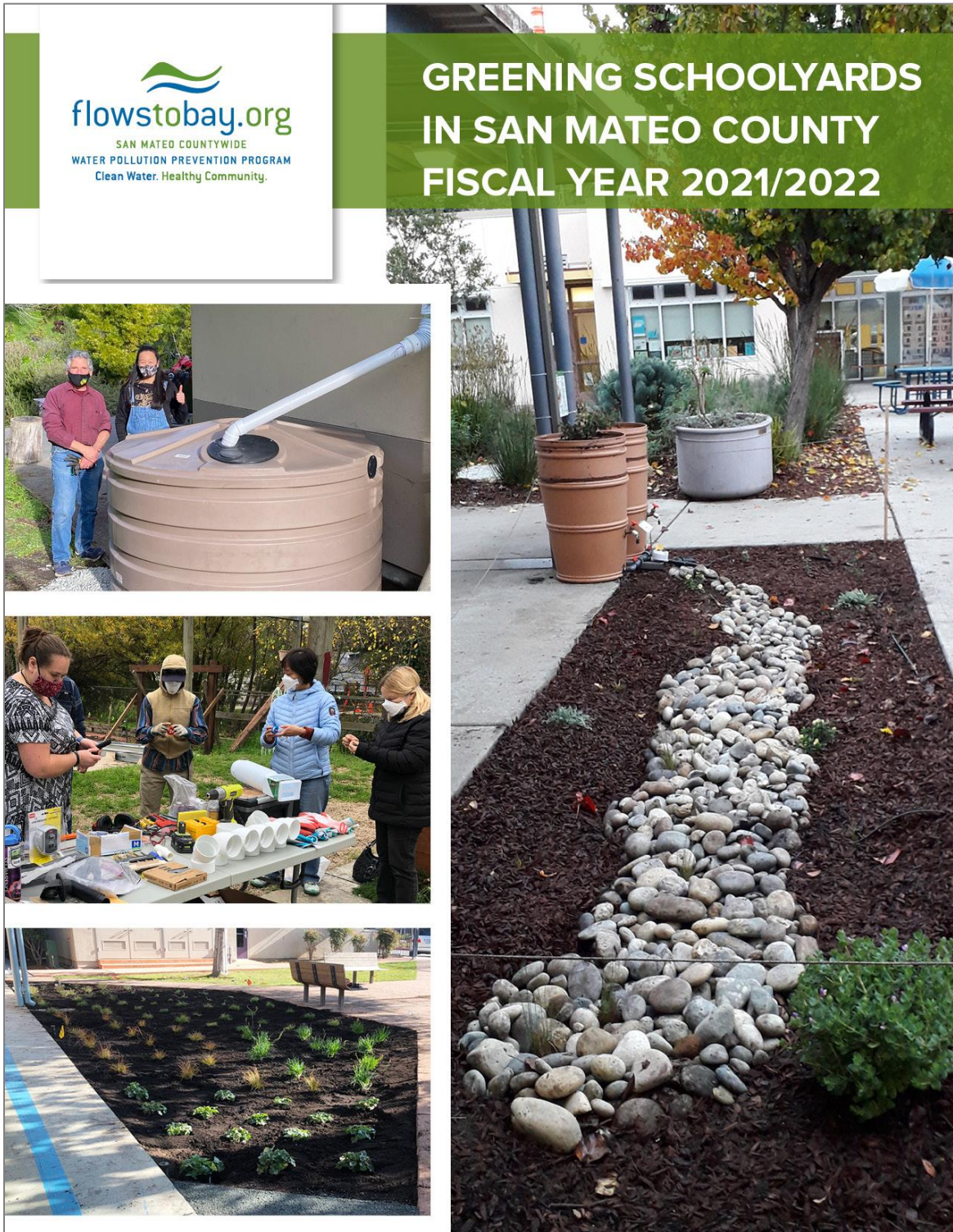
San Mateo County residents who take a short 3-minute survey after the webinar will be entered into our raffle. You'll have a chance to be the lucky attendee who wins a \$100 gift card to your choice of either Hassett Ace Hardware, Home Depot, or Lyngso Garden Materials to assist with your rain garden project!

LEARN MORE AND REGISTER HERE

Appendix 7e: SMCWPPP Blog and Analytics

Blog Title	Page Views	Unique Page Views	Time on Page	Bounce Rate
The Grades Are In for San Mateo County Beaches	463	444	0:07	71.84%
The Wonderful World of Native Plants	215	198	0:09:21	72.25%
Surfrider San Mateo: Making Waves for Ocean Protection	68	61	0:02	79.55%
Countywide Rain Barrel Pilot Program Helps Save Money & Water	147	136	0:01:24	67.86%
4 Tips To Have An Eco-Tastic Halloween!	51	45	0:02:55	75%
Orange Memorial Park Stormwater Capture Project	182	169	0:04:29	72.79%
Neil Panton is a Community Champion – No Butts About It	154	152	0:01:01	94.51%
How and When To Experience King Tides	285	262	0:03	83.20%
San Mateo County Residents Line Up To Help Conserve Water & Prevent Pollution	121	114	0:02:53	64.86%
Rain Gardens: Your Next Landscaping Project	126	115	0:03:28	62.07%
Belle Haven Elementary Rain Garden Installation Project	71	67	0:05:01	84.48%
A Water-Wise Champion Shares Her Rain Barrel Story	64	57	0:01:48	80.95%
2022 New Year's Resolutions For The Environment	39	38	0:00:44	93.75%
San Mateo County Residents Eager To Conserve Water With Rain Barrels	62	59	0:02:55	56.10%
Alejandra Warren Fell In Love with Zero Waste and So Can You	205	186	0:05:47	77.30%
Help Your Garden Bloom To Life This Spring With Eco-Friendly Weed Management Practices	158	150	0:03:44	76.42%
Celebrate Earth Day With Mindful Spring Cleaning	65	55	0:02:24	69.39%
How To Keep Our Waterways Clean For a Fresh Summer	60	58	0:04:42	80.00%
CA Drought Calls for Conserving Water and Keeping Our Waterways Clean	117	115	0:03:12	84.62%

Appendix 7f: Greening Schoolyards – School Campus Installations and Hands-On Workshops





GREENING SCHOOLYARDS IN SAN MATEO COUNTY

Greening Schoolyards in San Mateo County is part of the larger **Flows To Bay** public outreach and education program. It allows us to share our message about watershed protection, pollution prevention, and green stormwater infrastructure (GSI) with schools and the communities around them.

Through Greening Schoolyards, we install certain GSI projects on school campuses, including rain barrels, cisterns, and/or rain gardens. The goals of this project are to:

- 1 Conduct hands-on community-based events that engage schools and surrounding communities while educating and demonstrating to residents how they may install similar projects on their property.
- 2 Provide climate resilience benefits of GSI to school campuses which may include flood mitigation, reducing urban heat island effects, and increasing natural habitat for pollinators and birds.
- 3 Create an outdoor educational resource that may be used in classroom curricula to discuss the water cycle, environment, watersheds, and effects of climate change.

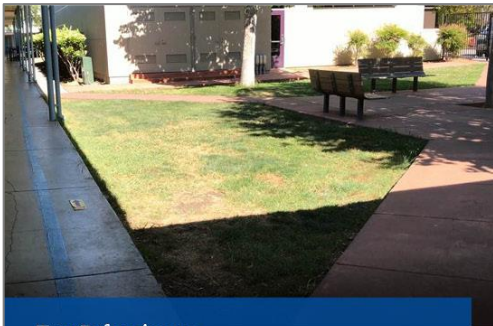


Program Details

- The school must also be able to host a community-based event (or events) on campus during the time of the installation. The event may be an in-person workshop or an online presentation to students.
- These measures will be limited to either a rain barrel or cistern, rain garden, or combination of two depending on our program's evaluation and availability of funds.
- Flows To Bay will cover all costs associated with the installation and community instruction.
- This program is on a first come, first serve basis until funds are no longer available.
- The school is responsible for ongoing maintenance and upkeep of the greening measure after installation.

Contact Information

If you are interested in participating or would like to learn more, contact Reid Bogert at info@flowstobay.org.



Top: Before image
Bottom: After image



Kevin Perry of Urban Rain Design created the rain garden landscape design and plant selection.



Octopus Agave (3)



Blue Elf Aloe (2)



Halmark Bulbine (10)



Purple Sage (12)



Coreopsis Moonbeam (12)



Rosada Coral Bells (15)



Berkeley's Sedge (26)



Orange Sedge (19)

PAST SCHOOL CAMPUS INSTALLATION PROJECTS

Belle Haven Elementary School, Menlo Park

Flows To Bay installed a rain garden on the campus of Belle Haven Elementary in December 2021. Representatives from C/CAG, the Ravenswood School District, and Climate Resilient Communities, met in June 2021 to visit the schools in Ravenswood School District after an initial meeting to explore ideas and opportunities for partnership.

An area with an existing downspout and irrigation system was jointly decided as the location for the new rain garden. The grass turf was replaced with California natives and covered with mulch with minimal excavation and help from community and school volunteers. The installation took place for the course of a 3-day weekend. Flows To Bay partnered with Lyngso Garden Materials to acquire donated materials for the rain garden.



Excavation of the existing turf.



A variety of native plants were chosen to provide habitat and attract pollinators.



Volunteers assisted in the planting of the new rain garden.



Post-installation photo of the cistern with plumbing components.

PAST SCHOOL CAMPUS INSTALLATION PROJECTS

Redwood High School, Redwood City

Flows To Bay installed a 660-gallon cistern on the campus of Redwood High School in January 2022. The water will be used to irrigate the nearby edible food garden inside three aboveground planter beds. A gravel base was added underneath the cistern for additional support. This installation was performed as part of a community workshop where attendees learned rain barrel basics, how rain barrels prevent stormwater pollution, and rain barrel maintenance best practices. After the presentation, attendees had the opportunity for hands-on learning and actively took part in the 2- hour installation where they were able to ask the presenter various rain barrel-related questions.

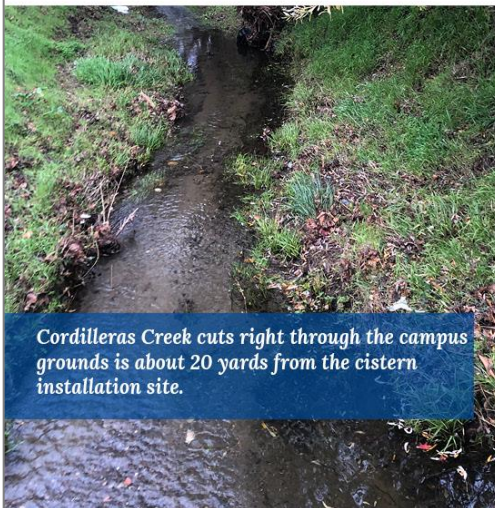
The installation site was near a portion of Cordilleras Creek, making the rain barrel installation even more impactful in terms of reducing runoff to a nearby waterway.



Rain barrel specialist, Chris Corvetti (left) and Redwood High School Vice Principal, Michael Kuliga.



Informational workshop with attendees and rain barrel specialist, Chris Corvetti.



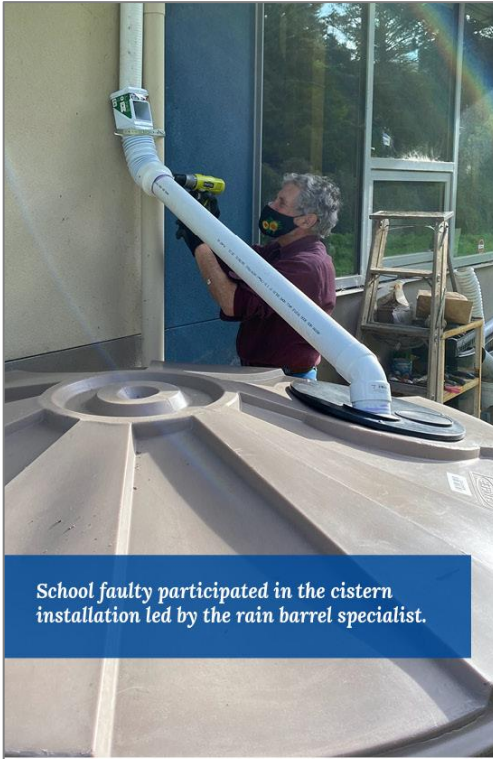
Cordilleras Creek cuts right through the campus grounds is about 20 yards from the cistern installation site.



Workshop attendees had the opportunity for hands-on participation and installation of the cistern



Other rain garden activity was happening on campus



School faculty participated in the cistern installation led by the rain barrel specialist.

PAST SCHOOL CAMPUS INSTALLATION PROJECTS

Westborough Middle School, South San Francisco

Flows To Bay installed a 660-gallon cistern on the campus of Westborough Middle School in January 2022. Teachers and their students wanted this cistern installed to help reduce local water pollution and provide a sustainable water source for surrounding plants, including many trees transplanted from areas with historical significance. The new rain cistern will also be used to irrigate the existing plants as well as new native plants the students are hoping to plant. The school will be installing a drip irrigation system to assist in watering their plants.

With an average annual rainfall of 22 inches in South San Francisco, the approximate 1,100sqft area of roof could capture over 15,000 gallons of water, potentially refilling either system 10+ times over the course of the year. The style and design of the wide and squat cistern do not require additional strapping or security measures.



Social studies teacher, Daniel Yanow (left) and science teacher, Corinna low (right) will be spearheading the student efforts with the cistern



The finished installation of a 220-gallon cistern utilizing under piping connected to a nearby downspout.

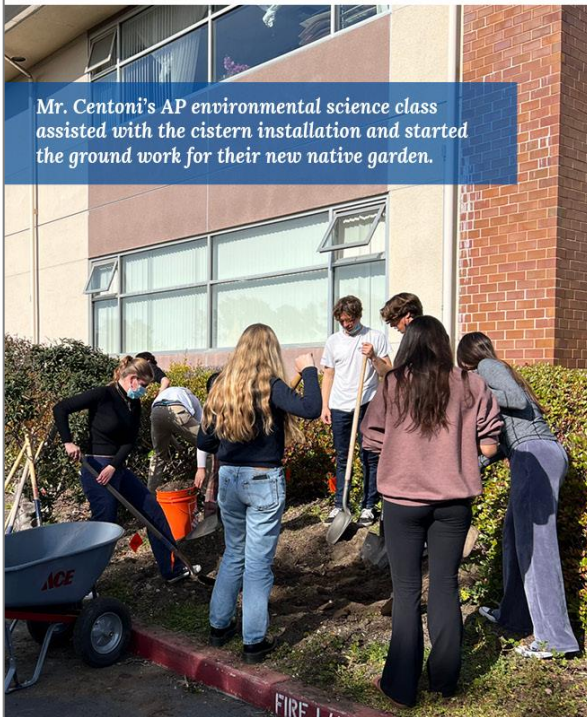
PAST SCHOOL CAMPUS INSTALLATION PROJECTS

Half Moon Bay High School, Half Moon Bay

With the assistance of Joseph Centoni, a teacher and science department chair at Half Moon Bay High School, and his AP environmental science class, Flows To Bay installed a 220-gallon cistern in April 2022. Prior to the installation day with the student, rain barrel specialist, Chris Corvetti, and Mr. Centoni leveled the ground and built a supporting gravel-filled foundation to ensure the stability since, once completely full, the cistern will weigh over 1,800 pounds.

The students also began installing a new native garden which will be watered by the cistern and its overflow once completed. The cistern will also help water surrounding park plants.

This is the first cistern installation that utilized underground piping to connect nearby downspout to the rain barrel. Mr. Centoni will use the rain barrel and garden as part of his class teachings.



Mr. Centoni's AP environmental science class assisted with the cistern installation and started the ground work for their new native garden.





The 205-gallon barrel was installed by members of the school and surrounding community

PAST SCHOOL CAMPUS INSTALLATION PROJECTS

Laurel Elementary School, San Mateo

Flows To Bay installed a 205-gallon cistern on the campus of Laurel Elementary in April 2022. The school was interested in rainwater capture as something that can be shared and discussed with students and to also help make the campus rainwater resilient. A fenced location was chosen that provided easy access to the water spout, but limited access to the rain barrel by the younger students. The location also provided an existing concrete foundation, so no additional foundation preparation was needed. Due to the height of the cistern, earthquake-proof strapping was added for additional stability and support.

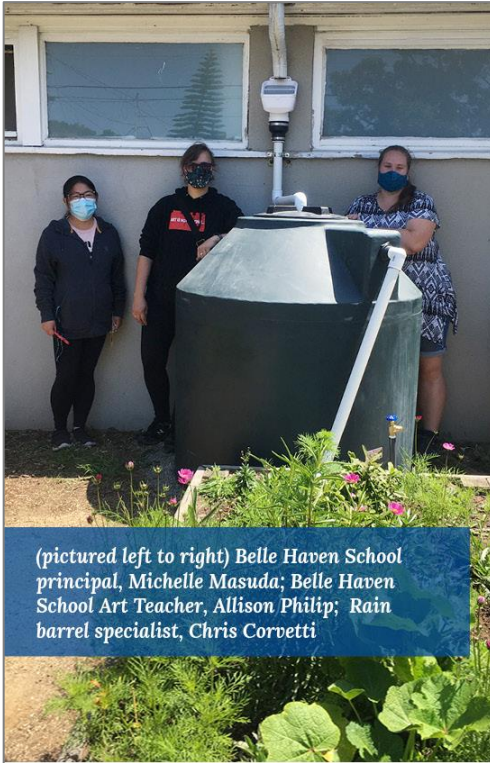
This installation was performed as part of a community workshop where attendees learned rain barrel basics, how rain barrels prevent stormwater pollution, and rain barrel maintenance best practices. After the presentation, attendees had the opportunity for hands-on learning and actively took part in the 2- hour installation where they were able to ask the presenter various rain barrel-related questions.



Informational workshop with attendees and rain barrel specialist, Chris Corvetti.



Workshop attendees had the opportunity for hands-on participation and installation of the cistern



(pictured left to right) Belle Haven School principal, Michelle Masuda; Belle Haven School Art Teacher, Allison Philip; Rain barrel specialist, Chris Corvetti

PAST SCHOOL CAMPUS INSTALLATION PROJECTS

Belle Haven Elementary School, Menlo Park

Flows To Bay installed a 305-gallon cistern on the campus of Belle Haven Elementary in April 2022. After having a rain garden installed in December 2021 (page 6), the school wanted to take further steps in making their campus rainwater resilient while finding a sustainable way to irrigate their planter box garden located in the kindergarten yard.

This installation was led by rain barrel specialist Chris Corvetti, Belle Haven principal Michelle Masuda, and Belle Haven art teacher Allison Philip.

This installation was performed as part of a community workshop where attendees learned rain barrel basics, how rain barrels prevent stormwater pollution, and rain barrel maintenance best practices. After the presentation, attendees had the opportunity for hands-on learning and actively took part in the installation where they were able to ask the presenter various rain barrel-related questions.



Rain barrel specialist taking workshop attendees in step-by-step instructions for installing a rain barrel.

Appendix 9

- Parks Maintenance & IPM Work Group Attendance List FY 2021/22
- Landscape Integrated Pest Management (IPM) Workshop – March 16, 2022
 - Workshop Agenda
 - Attendance List
 - Evaluations Summary
- Pest Control Point of Purchase Outreach
- Pest Control Contracting Outreach

**San Mateo Countywide Water Pollution Prevention Program
Parks Maintenance IPM Work Group Attendance List - FY 2021/22**

Contact Information			Attendance
MUNICIPALITY	REPRESENTATIVE	EMAIL	11/30/2021
Atherton	Sally Bentz-Dalton	sbentz@ci.atherton.ca.us	X
Belmont	Daniel Ourtiague	dourtiague@belmont.gov	
	Matt Ward	mward@belmont.gov	
Brisbane	Keegan Black	kblack@ci.brisbane.ca.us	X
	Joe Friars		X
Burlingame	Rich Holtz	Rholtz@burlingame.org	
	Cornelius Brosnan	cbrosnan@burlingame.org	X
Colma	Louis Gotelli	Louis.Gotelli@colma.ca.gov	
	Brian Dossey	brian.dossey@colma.ca.gov	
Daly City	Chris Caliendo	ccaliendo@dalycity.org	X
	Jeff Fornesi	jfornesi@dalycity.org	
	Sibely Calles	scalles@dalycity.org	
	Dennis Bray	dbray@dalycity.org	
	Nicholas Crescenzi	ncrescenzi@dalycity.org	
	Jeff Templin	jtemplin@dalycity.org	
East Palo Alto	Jay Farr	jfarr@cityofepa.org	
	Lenin Mecgar	lmecgar@cityofepa.org	
	Benjamin Zarrabi	bzarrabi@cityofepa.org	X
	Michelle Daher	mdaher@cityofepa.org	
Foster City	Greg Baeza	gbaeza@fostercity.org	X
	Frank Fanara	Ffanara@fostercity.org	X
	Taniela Mapa	tmapa@fostercity.org	X
Half Moon Bay	Katherine Sheehan	katherines@csgengr.com	
	Maziar Bozorginia	MBozorginia@hmbcity.com	
Hillsborough	Garry Francis	gfrancis@hillsca.org	
	Natalie Asai	nasai@HILLSBOROUGH.NET	
Menlo Park	Sheena Ignacio	smignacio@menlopark.org	
Millbrae	Ken Crosetti	kcrosetti@ci.millbrae.ca.us	
	John Gianoli	jgianoli@ci.millbrae.ca.us	
Pacifica	A. Clark	clarka@ci.pacifica.ca.us	
	Estevan Renteria	Lavorinip@ci.pacifica.ca.us	
	Raymond Donguines	donguinesr@ci.pacifica.ca.us	
Portola Valley	Howard Young	hyoung@portolavalley.net	
Redwood City	Lucas Wilder	LWilder@redwoodcity.org	X
	Terence Kyaw	TKyaw@redwoodcity.org	
	Dominique Herbert		X
	Tony Bravo		X
	Francisco Espinoza	fespinoza@redwoodcity.org	
San Bruno	Rene Walsh	rwalsh@ci.sanbruno.ca.us	
	Danielle Brewer	DBrewer@sanbruno.ca.gov	
	Dan Venezia	Dvenezia@sanbruno.ca.gov	

**San Mateo Countywide Water Pollution Prevention Program
Parks Maintenance IPM Work Group Attendance List - FY 2021/22**

Contact Information			Attendance
MUNICIPALITY	REPRESENTATIVE	EMAIL	11/30/2021
San Carlos	Arturo Burgueno	aburgueno@cityofsancarlos.org	
	Chris Zanoni	czanoni@cityofsancarlos.org	
	Jean St. Martin	jsaintmartin@cityofsancarlos.org	
	Luis Estrada	lestrada@cityofsancarlos.org	X
	Kathryn Robertson	krobertson@cityofsancarlos.org	
City of San Mateo	Sarah Scheidt	sscheidt@cityofsanmateo.org	
	Jim Burch	JBurch@sanbruno.ca.gov	
	Dennis Pawl	dpawl@cityofsanmateo.org	
	Sven Edlund	sedlund@cityofsanmateo.org	
	Ron Hostick	rhostick@cityofsanmateo.org	
San Mateo Co. Parks	Sam Herzberg	SHerzberg@co.sanmateo.ca.us	
	Scott Lombardi	slombardi@co.sanmateo.ca.us	
	Julie Casagrande	jcasagrande@co.sanmateo.ca.us	
	Kim Springer	kspringer@smcgov.org	
	Dan Krug	dkrug@smcgov.org	X
SMC Sustainability	John Allan	jallan@smcgov.org	X
SM County PW	Jeff Pacini	JPacini@co.sanmateo.ca.us	
	Kevin Lu	khlu@smcgov.org	
County Agriculture Weights and Measures	Ione Yuen	IYuen@smcgov.org	
	Jeremy Wagner	JWagner@smcgov.org	
	Joseph Hannen	JHannen@smcgov.org	
	Jenny Gossett	jgossett@smcgov.org	X
	Richard Garcia	rgarcia@smc.gov	
	Nancy Poss	Nposs@smc.gov	X
SSF	Donald Louie	douald.louie@ssf.net	
	Joshua Richardson		X
	Greg Mediati	Greg.Mediati@ssf.net	X
Woodside	Dong Nguyen		
	Sean Rose	srose@woodsidetown.org	
UCCE/UC IPM	Andrew Sutherland	amsutherland@ucanr.edu	
EOA	Jon Konnan	jkonnan@eoainc.com	
	Vishakha Atre	vatre@eoainc.com	X
	Eliza Perkins	eperkins@eoainc.com	X
SMCWPPP	Matt Fabry	mfabry@smcgov.org	
	Reid Bogert	rbogert@smcgov.org	
Other Attendees			
Kelly Carrol	CSG/Half Moon Bay/Colma	kellyc@csgengr.com	
Lauren Galanes	Gachina Landscaping	lgalanes@gachina.com	
Patrick Bobias	Gachina Landscaping	pbobias@gachina.com	
William Segale	Segale&Cerini, Inc		X



AGENDA

Landscape Integrated Pest Management (IPM) Webinar (Sponsored by SMCWPPP Parks Maintenance and IPM Workgroup) Wednesday, March 16, 2022 8:30 am – 12:30 pm

Welcoming Remarks and Instructions for Continuing Education Vishakha Atre, <i>EOA</i>	8:30 am – 8:40 am
Regulatory Update - Pesticides Toxicity Control Requirements in the Municipal Stormwater Regional Permit Vishakha Atre, <i>EOA</i>	8:40 am – 8:50 am
IPM for Weed Management in Urban Areas Nancy Poss, <i>San Mateo County Agriculture/Weights and Measures</i>	8:50 am – 9:30 am
Using IPM Techniques for Vegetation Maintenance in Bioretention Areas Peter Schultze-Allen, <i>EOA</i>	9:30 am – 10:15 am
Review questions and break	10:15 am – 10:30 am
IPM Techniques for Managing New Urban Pests of Concern Dr. Igor Lacan, <i>UC Cooperative Extension</i>	10:30 am – 11:15 am
Regulatory Update, Common Violations Richard Garcia, <i>San Mateo County Agriculture/Weights and Measures</i>	11:15 am – 12:15 pm
Quiz for Continuing Education Units	12:15 pm
Adjourn	12:30 pm

SMCWPPP Landscape IPM Workshop

March 16, 2022

Attendance List

First Name	Last Name	Agency
John	Thompson	City of Daly City
Alain	Urruty	City of Belmont
Jeffrey	Coffey	City of Belmont
Kieran	Cronin	City of Belmont
Michael	Stevens-Nappi	City of Belmont
Sean	Brosnan	City of Belmont
Joe	Friars	City of Brisbane
Keegan	Black	City of Brisbane
Richard	Holtz	City of Burlingame
Stephen	Pappas	City of Burlingame
James	Delaney	City of Burlingame
Cornelius	Brosnan	City of Burlingame
Carlo Celedio	Celedio	City of Daly City
Chris	Caliendo	City of Daly City
Fernando	Barron	City of Daly City
Javier Paredes	Paredes	City of Daly City
Jeff	Templin	City of Daly City
Jimmy	Vistan	City of Daly City
Nicholas	Crescenzi	City of Daly City
Oswaldo	Salinas	City of Daly City
Pedro	Guzman	City of Daly City
Michael	Potter	City of Daly City
Kayla	Surprenant	Department of Pesticide Regulation
Adonis	Travis	City of East Palo Alto
Daniel	Weber	City of Foster City
Frank	Fanara	City of Foster City
Garrett	Gotthardt	City of Foster City
Greg	Baeza	City of Foster City
Jamie	Echeverria	City of Foster City
Lava	Kioa	City of Foster City
Manuel	Garcia	City of Foster City
Matthew	Ryan	City of Foster City
Salvador	Acevedo	City of Foster City
Taniela	Mapa	City of Foster City
Todd	Haena	City of Foster City
Will	Ventura	City of Foster City
Carlos	Munguia	City of Foster City
Alberto	Ayala	Gachina Landscape Management
Cristina	Prevarin	Gachina Landscape Management
Enrique	Perez	Gachina Landscape Management
Norma Evelyn	Gallegos	Gachina Landscape Management
Jesus	Sanchez	Gachina Landscape Management

SMCWPPP Landscape IPM Workshop

March 16, 2022

Attendance List

Juan (Jose)	Alcazar	Gachina Landscape Management
Lauren	Galanes	Gachina Landscape Management
Paul	Leon	Gachina Landscape Management
Carlos	Contreras	Gachina Landscape Management
Ivan	Ramos	Gachina Landscape Management
Shawn	Dardenelle	Go Native, Inc
Gino	Assereto	City of Pacifica
Harvey	Dela Cruz	City of Pacifica
Nathan	McClure	City of Pacifica
Paul	Lavorini	City of Pacifica
Michael	Pham	City of Pacifica
Justin	Bixby	Town of Portola Valley
Glenn	Fukudome	City of Redwood City
Jean	St. Martin	City of San Carlos
Luis	Estrada	City of San Carlos
Aaron	Francis	San Mateo County
Jeffrey	Pacini	San Mateo County
John	Allan	San Mateo County
Luis	Carlos	San Mateo County
Selena	Gonzalez	San Mateo County
Sultan	Henson	San Mateo County
Theresa	M Engle	San Mateo County
Ione	Yuen	San Mateo County Dept of Agriculture
Jennifer	Gossett	San Mateo County Dept of Agriculture
Jeffrey	Murray	San Mateo County DPW
Julie	Casagrande	San Mateo County DPW
Khoa	Vo	San Mateo County DPW
Ryan	Rasmussen	San Mateo County DPW
Daniel	Krug	San Mateo County Parks
Greg	Escoto	San Mateo County Parks
Joe	Immethun	San Mateo County Parks
Lisa	Di Lorenzo	San Mateo County Parks
Mark	Rogers	San Mateo County Parks
Matthew	Del Carlo	San Mateo County Parks
Paul	Jordan	San Mateo County Parks
Sean	Correa	San Mateo County Parks
Samantha	Faul	San Mateo County Parks
David	Modena	San Mateo County Public Works
Brian	Brunelli	City of South San Francisco
Donald	Louie	City of South San Francisco
Peter	Shea	City of South San Francisco



Summary of Evaluation Forms

84 Attendees
25 Evaluations

Landscape Integrated Pest Management (IPM) Workshop
(Sponsored by SMCWPPP Parks Maintenance and IPM Workgroup)
Zoom Webinar Wednesday, March 16, 2022
8:30 a.m. – 12:30 p.m

What Did You Think of the Following Presentations?

1. **Pesticides Toxicity Control Requirements in the Municipal Regional Permit -**
Vishakha Atre, *EOA, Inc.*

21 very helpful 4 somewhat helpful 0 not helpful

2. **IPM for Weed Management in Urban Areas –** Nancy Poss, *San Mateo County Agriculture/Weights and Measures*

23 very helpful 2 somewhat helpful 0 not helpful

3. **Using IPM Techniques for Vegetation Maintenance in Bioretention Areas –** Peter Schultze-Allen, *EOA, Inc.*

23 very helpful 2 somewhat helpful 0 not helpful

4. **IPM Techniques for Managing New Urban Pests of Concern –** Dr. Igor Lacan, *UC Cooperative Extension*

19 very helpful 6 somewhat helpful 0 not helpful

5. **Regulatory Update, Common Violations –** Richard Garcia, *San Mateo County Agriculture/Weights and Measures*

19 very helpful 6 somewhat helpful 0 not helpful

Did this workshop meet your expectations? 25 Yes 0 No

Suggestions for future workshop topics:

- I would like to see some aquatic applications for Algae.
- In-person please

General Comments:

- These are fun
- Great topics and presentations
- So much fun
- I look forward to this every year! Thank you!
- Though some of the topics were less relevant to my work within parks that mostly contain wildlands, I understood the relevancy of each presentation to the group as a

whole and found useful and applicable information in all the presentations. It would have been nice to have a more interactive format, though I understand the limitations of remote workshops.

- Thank you

Appendix 9 (Public Outreach)

Appendix 9a: Point of Purchase Outreach



Figure 9a-1. Photographs from FY 21/22 in-person tabling events for POP outreach.



Get In- Person Pest Management Advice!

**March 26, 2022
11am - 3pm**

**The Home Depot San Mateo
2001 Chess Drive
San Mateo, CA 94404**

Look for Pest
Management Expert
Charlotte near the pest
products aisle!



Get In- Person Pest Management Advice!

**April 23, 2022
11am - 3pm**

**Hassett Ace Hardware
348 Woodside Plaza #282
Redwood City, 94061**



Look for Pest
Management Expert
Charlotte near the pest
products aisle!

Figure 9a-2. Designed graphics to promote the IPM-focused webinars.

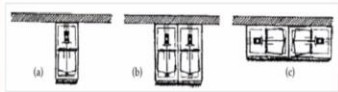


Figure 9a-3. Photographs from FY 21/22 in-person store visits for POP outreach.



WORKING WITH TRAPS SUCCESSFULLY

- Bait traps with
 - Slim Jim, meat stick
 - Chewy granola bar
 - Fig Newton
 - Dog Kibble, Kitty Kibble
 - Walnut or other nut meat
- Bait traps first without setting them
- Move trap every few days if not having success
- Saturate the area with traps
- Remove rodent immediately, dispose in a sealed bag and place into garbage



Placement of snap traps: (a) single trap with trigger next to wall; (b) double set, which increases your success; (c) double set placed parallel to the wall with triggers to the outside.



Charlotte Canner (she/her)

Q&A

Open(6)
Answered(2)
Dismissed

SB Sandy Bardas 10:37 AM

Will these slides be available? The pictures are so helpful!

Answer live
Type answer

Anonymous Attendee 10:37 AM

How thick is the layer of mulch?

Answer live
Type answer

LE Leane Eberhart 10:38 AM

What types of plants are good to combat weeds without needing a lot of water?

Answer live
Type answer

TP Tracy Phillips 10:39 AM

how do you eradicate oxalis? last year I pulled it up including corms & now its back

Answer live
Type answer


Anonymous Attendee 10:39 AM

Flows To Bay is live now.
Published by ZOOM Video Livestream - Prod • 11 mins

We're live! Join us now for a webinar on eco-friendly weed management tips for Spring! Register and join here: <https://bit.ly/march-webinar-flowstobay>

One lucky attendee will win a \$100 gift card to a local hardware store of their choice!

LIVE 1



Purple deadnettle, *Lamium purpureum*

Let's look at irrigation & drainage


Weeds that grow in wet, poor draining soil:
- Dock, Chickweed, Purple Loosestrife

Weeds that grow in dry soil:
- Mullen, Mustard, Thistle

Weeds that grow in hard, compact soil:
- Field Mustard, Thistle, Quack Grass

break up that soil, amend it, increase the drainage. So

- Amend the soil to improve the drainage or water holding capacity
- Aerate the soil to reduce compaction



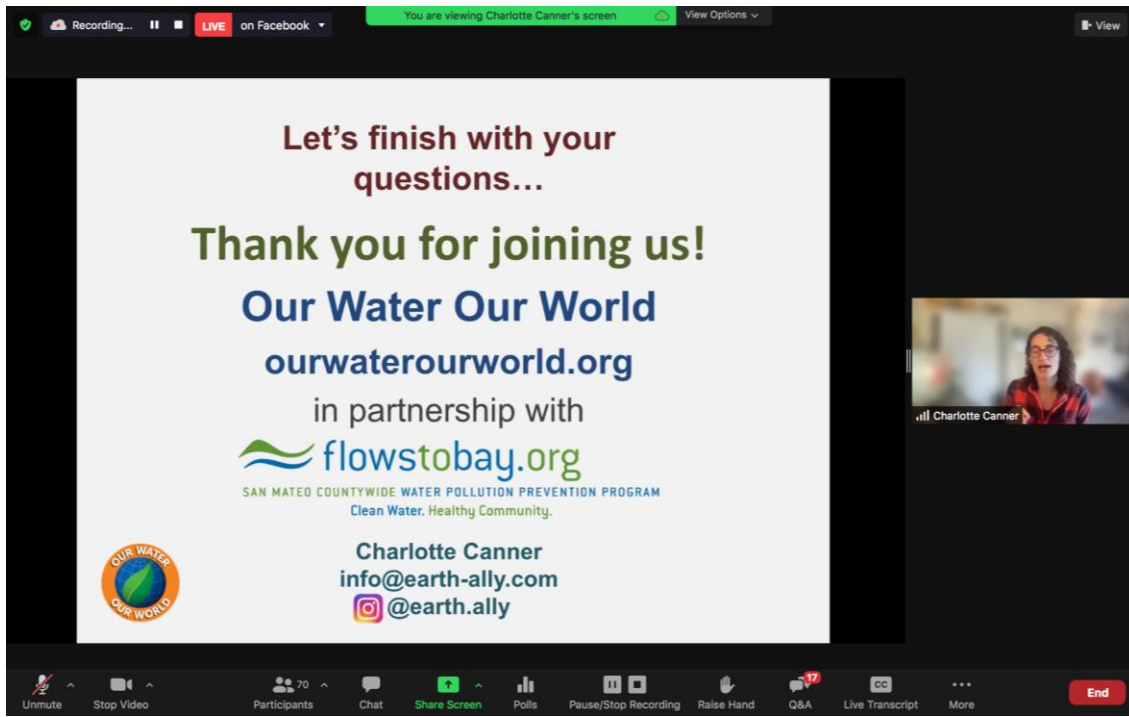


Figure 9a-4. Screenshots captured during this fiscal year's IPM-focused webinars.



Fall Tips for a Pest-Free Garden

Free Webinar!

flowstobay.org

**October 6
5-6:30 PM
Online**

The graphic features a central illustration of a raised garden bed with small green seedlings. To the left is a wheelbarrow filled with autumn leaves. In the foreground, there is a bag of 'ORGANIC FERTILIZER' and a bucket of 'COMPOST'. A wheelbarrow is also shown to the right of the garden bed. The background includes a large tree with yellow autumn leaves and scattered leaves on the ground. The text 'flowstobay.org' is positioned above the garden bed, and the date and time are in the bottom right corner.



**Spring Blooming:
Eco-Friendly Weed Management**

**FREE
Online
Webinar**

Saturday, March 12th, 2022 | 10am - 11:30am


flowstobay.org

The graphic shows a woman and a child kneeling in a garden, tending to a tomato plant. A basket of garden tools is on the left. The background is a light blue sky with a white picket fence and a house. A large sunflower icon on the left contains the text 'FREE Online Webinar'. The date and time are in a green banner across the middle. The website 'flowstobay.org' is in the bottom right corner.

Figure 9a-5. Designed graphics to promote the IPM-focused webinars.

IPM Tips

flows to bay.org
@earth.ally




Did you know that 90% of the bugs in the garden are helpful “good” bugs?

These beneficial insects do a lot of pest management for us by eating or parasitizing pest insects.


To **invite** the good bugs:

- Plant a variety of flowers like daisies, sunflowers, yarrow, ceanothus, tansy and more!
- Avoid all pesticides (even the eco-friendlies!) as they can harm good bugs



IPM Tips

flows to bay.org
@earth.ally



Why should you switch to organic fertilizer?

Organic fertilizers:

- provide slowly released nutrients to your soil & plants, for sustained growth over time.
- will help your plants be stronger and less attractive to pests.
- are made from natural materials like kelp, manure, and compost, as opposed to fossil fuels.
- don't cause runoff that harms waterways and aquatic life.



Figure 9a-6. Examples of “Simple Tip” social media posts (2 x monthly) discussing a seasonal pest, identification, life cycle, prevention, and control options.

Appendix 9b: Pest Control Contracting Outreach



555 County Center
Redwood City, CA 94063

P 650.599.1406
flowstobay.org

June 3, 2022

Pest Control Professionals:

Help Protect San Mateo County Waterways from Pesticides in Stormwater Runoff

Pest control professionals in San Mateo County play a critical role in keeping pesticides out of our local creeks, the San Francisco Bay, and the Pacific Ocean. The City/County Association of Governments of San Mateo County administers the San Mateo Countywide Water Pollution Prevention Program, which assists local governments with reducing pollution in stormwater runoff.

We need your help to protect our waterways from pesticides that can be mobilized during storm events after being applied.

Water quality monitoring data in San Mateo County show ongoing toxicity impacts in local creeks related to the application of structural pest control products, especially those including pyrethroids and fipronil, among others. Because of this, we encourage all pest control professionals who work in San Mateo County to adopt Integrated Pest Management (IPM) practices to help minimize the negative effects on water quality and aquatic life.

Next Steps You Can Take:

- Become a certified IPM pest control operator through EcoWise, GreenPro, or Green Shield certification process.
- If your business is already certified, please consider having individual employees certified as well.
- If your business is IPM certified, **please confirm** that you are listed on our "IPM Pest Control Operators" section at flowstobay.org/pestpro.

Contact Us

If you need more information or have any questions, please contact Reid Bogert at (650) 599-1433 or email rbogert@smcgov.org. Find more information about IPM practices and IPM certification at flowstobay.org/pestpro.

Sincerely,



Reid Bogert
Senior Program Specialist
City/County Association of Governments, San Mateo County

Table 9b-1. Database of Active Pest Control Operators in San Mateo County

Name	Business Name	License Number	License Status	Issuance Date	Expiration Date	Address	City
COHEN, JEROME	SAN FRANCISCO PEST EXPERT	12101	Clear	10/11/2010	6/30/2022	19 HOLIDAY CT PACIFICA CA 94044 SAN MATEO COUNTY	Pacifica
GURNEY, CHARLES LEE	A & R TERMITE CONTROL INC	5315	Clear	9/15/1976	6/30/2021	1118 EAST 5TH AVE SAN MATEO CA 94402 SAN MATEO COUNTY	San Mateo
POWELL, BRIAN	BEST PEST SERVICE INC	11765	Clear	10/20/2008	6/30/2023	218 SHAW ROAD STE G SOUTH SAN FRANCISCO CA 94080 SAN MATEO COUNTY	South San Francisco
HUSTED, BRET DENNING	PREVENTION INSPECTION SERVICES	11737	Clear	8/4/2008	6/30/2023	1748 SWEETWOOD DRIVE DALY CITY CA 94015 SAN MATEO COUNTY	Daly City
COURTEMANCHE, CARL OVIDE	CAM AM PEST CONTROL	10108	Clear	11/12/1999	6/30/2023	332 POPLAR AVENUE REDWOOD CITY CA 94061 SAN MATEO COUNTY	Redwood City
GAVARRETE, CHESETER	WEST VALLEY STRUCTURAL CO	9505	Clear	3/15/1996	6/30/2022	PO BOX 2 SOUTH SAN FRANCISCO CA 94083 SAN MATEO COUNTY	South San Francisco
BOYNTON, WILLIAM	Cook and Associates - Cookton Enterprises Inc DBA	13234	Clear	9/20/2017	6/30/2023	1101 JUDSON STREET BELMONT CA 94002 SAN MATEO COUNTY	Belmont

Name	Business Name	License Number	License Status	Issuance Date	Expiration Date	Address	City
DONOVAN, JAMES EDWARD	DONOVANS PEST CONTROL INC	9728	Clear	7/7/1997	6/30/2021	PO BOX 6910 SAN MATEO CA 94403 SAN MATEO COUNTY	San Mateo
GOSS, JEFFREY	DONOVANS PEST CONTROL INC	12632	Clear	12/27/2013	6/30/2022	PO BOX 6910 SAN MATEO CA 94403 SAN MATEO COUNTY	San Mateo
SU, DAN NOEL	PACIFIC PEST MANAGEMENT	12289	Clear	12/7/2011	6/30/2023	3917 BERESFORD ST #5 SAN MATEO CA 94403 SAN MATEO COUNTY	San Mateo
DIODATI, ARMANDO	GOLDEN GATE TERMITE CONTROL INC	5237	Clear	1/1/1976	6/30/2021	328 LANG ROAD BURLINGAME CA 94010 SAN MATEO COUNTY	Burlingame
DIODATI, GIOVACCHINO	GOLDEN GATE TERMITE CONTROL INC	5272	Clear	1/1/1976	6/30/2021	328 LANG ROAD BURLINGAME CA 94010 SAN MATEO COUNTY	Burlingame
CARR, JAMES PATRICK	EUREKA VALLEY PEST EXCLUSION INC	10446	Clear	6/13/2001	6/30/2021	P O BOX 1896 PACIFICA CA 94044-6896 SAN MATEO COUNTY	Pacifica
OUTMAN, MATTHEW ROBERT	MATT OUTMAN	9048	Clear	10/29/1992	6/30/2022	108 SCENIC DRIVE REDWOOD CITY CA 94062 SAN MATEO COUNTY	Redwood City
HOWLETT, STEVEN JEFFERY	EVEN STEVENS PEST CONTROL	8194	Clear	1/1/1988	6/30/2021	1612 EL VERANO WAY BELMONT CA 94002 SAN MATEO COUNTY	Belmont

Name	Business Name	License Number	License Status	Issuance Date	Expiration Date	Address	City
JAURIGUI, DAVID JOSEPH	ALERT PEST CONTROL CO INC	10739	Clear	6/6/2003	6/30/2023	182 SCHOOL STREET DALY CITY CA 94014 SAN MATEO COUNTY	Daly City
JAURIGUI, JOHN J	ALERT PEST CONTROL CO INC	6999	Clear	1/1/1984	6/30/2022	182 SCHOOL STREET DALY CITY CA 94014 SAN MATEO COUNTY	Daly City
JAURIGUI, MICHAEL JOHN	ALERT PEST CONTROL CO INC PICK A PRO NOW	10723	Clear	5/9/2003	6/30/2023	182 SCHOOL STREET DALY CITY CA 94014 SAN MATEO COUNTY 950 COMMERCIAL AVE SOUTH SAN FRANCISCO CA 94080 SAN MATEO COUNTY	Daly City; South San Francisco
FLETCHER, JAMES ROBERT	COMPLETE PEST CONTROL	10634	Clear	9/23/2002	6/30/2023	PO BOX 315 REDWOOD CITY CA 94064-0315 SAN MATEO COUNTY	Redwood City
SANCHEZ, ANDY WILLIAMS	GENESIS BUILDING SERVICES INC	13416	Clear	9/13/2018	6/30/2021	P O BOX 25360 SAN MATEO CA 94402 SAN MATEO COUNTY	San Mateo
CHUNG, JOHN	BLUEBIRD TERMITE	13395 and 12432	Clear	8/14/2018	6/30/2021	533 AIRPORT BLVD #400 BURLINGAME CA 94010 SAN MATEO COUNTY	Burlingame
CHUNG, STEVEN	BLUEBIRD TERMITE	8156	Clear	10/21/12	6/30/21	533 AIRPORT BLVD #400	Burlingame

Name	Business Name	License Number	License Status	Issuance Date	Expiration Date	Address	City
KAHNER, BENJAMIN	ELITE BAY AREA TERMITE CONTROL BENS TERMITE SOLUTIONS	12617	Clear	11/25/2013	6/30/2022	1318 OLD COUNTY RD BELMONT CA 94002 SAN MATEO COUNTY	Belmont
PALMER, KEVIN JAMES	PREMIER TERMITE INC	8400	Clear	7/10/1989	6/30/2022	PO BOX 266/ 116 N CABRILLO HWY HALF MOON BAY CA 94019 SAN MATEO COUNTY	Half Moon Bay
RETTKE, MONTE JOSEPH	J K CONTROL INC	9419	Clear	7/1/1995	6/30/2022	200 VALLEY DRIVE #35 BRISBANE CA 94005 SAN MATEO COUNTY	Brisbane
FUSON, KENNETH JACOB	KEN FUSON PEST MANAGEMENT SERVICES	9794	Clear	12/3/1997	6/30/2021	111 ELM STREET MENLO PARK CA 94025 SAN MATEO COUNTY	Menlo Park
SILVA, ARMANDO	MARINA PEST CONTROL CORPORATION	11539	Clear	7/3/2007	6/30/2022	150 S SPRUCE S SAN FRANCISCO CA 94080 SAN MATEO COUNTY	South San Francisco
MARKOFF, PAUL LINDEN	MARKOFF STRUCTURAL PEST CONTROL CO	4739	Clear	1/1/1973	6/30/2022	6018 MISSION STREET DALY CITY CA 94014 SAN MATEO COUNTY	Daly City
WONG, HENDRICK	ONE SOURCE TERMITE CONTROL TEAM PEST SOLUTIONS	8468	Clear	11/22/1989	6/30/2022	8 WESTPARK DRIVE DALY CITY CA 94015 SAN MATEO COUNTY	Daly City

Name	Business Name	License Number	License Status	Issuance Date	Expiration Date	Address	City
IACOPI, PETER MICHAEL	COASTSIDE TERMITE	9433	Clear	7/31/1995	6/30/2022	P O BOX 116 HALF MOON BAY CA 94019 SAN MATEO COUNTY	Half Moon Bay
CRUMPTON, RICHARD EARL	POWER PEST CONTROL	8946	Clear	4/21/1992	6/30/2021	P O BOX 451 BELMONT CA 94002 SAN MATEO COUNTY	Belmont
NG, PUI KWONG	TERMITE EXTERMINAT OR	9355	Clear	1/11/1995	6/30/2021	1602 ROBERTA DRIVE SAN MATEO CA 94403 SAN MATEO COUNTY	San Mateo
O'HARA, TIMOTHY DAVID	O HARAS PEST CONTROL	8185	Clear	1/1/1988	6/30/2021	P O BOX 6 SAN GREGORIO CA 94074 SAN MATEO COUNTY	San Gregorio
NEUMANN, ROBERT HEINZ	KAPTO TERMITE CONTROL	7622	Clear	1/1/1986	6/30/2022	1530 ARROYO AVENUE SAN CARLOS CA 94070 SAN MATEO COUNTY	San Carlos
WALKER, KEVIN	CRANE PEST CONTROL	13316	Clear	3/12/2018	6/30/2023	2700 GEARY BOULEVARD SAN FRANCISCO CA 94118 SAN FRANCISCO COUNTY	San Francisco
RUSH, MARK STEVEN	ON SITE INSPECTIONS INC	10066	Clear	7/28/1999	6/30/2023	461 ALTA VISTA DRIVE SOUTH SAN FRANCISCO CA 94080 SAN MATEO COUNTY	South San Francisco
FONG, SHERMAN	X PEST EXTERMINAT ORS	418	Clear	12/17/19	06/30/22	100 NORTH HILL DRIVE #40	Brisbane

Name	Business Name	License Number	License Status	Issuance Date	Expiration Date	Address	City
						BRISBANE CA 94005 SAN MATEO COUNTY	
RUBINA, JOSE LUIS	X PEST EXTERMINATORS	5734	Clear	1/1/1978	6/30/2023	100 NORTH HILL DRIVE #40 BRISBANE CA 94005 SAN MATEO COUNTY	Brisbane
CHU, ZON	ZC & ASSOCIATES PEST CONTROL	11614	Clear	11/28/2007	6/30/2022	235 WESTLAKE CENTER #381 DALY CITY CA 94015 SAN MATEO COUNTY	Daly City
GIORGI, DAVID JOHN	ECOTECH PEST ELIMINATION	9288	Clear	7/7/1994	6/30/2021	P O BOX 1418 MILLBRAE CA 94030 SAN MATEO COUNTY	Millbrae
GIORGI, JONATHAN	ECOTECH PEST ELIMINATION INC.	8420	Clear	9/17/19	6/30/22	PO BOX 1418 MILLBRAE CA 94030 SAN MATEO COUNTY SOUTH SAN FRANCISCO CA 94080 SAN MATEO COUNTY	Millbrae
HA, QUANG	BAY AREA PEST CONTROL	11762	Clear	10/17/2008	6/30/2023	110 GLENN WAY #13 SAN CARLOS CA 94070 SAN MATEO COUNTY	San Carlos
HASTIE, HARRY	HASTIE TERMITE COMPANY THE	4704	Clear	1/1/1973	6/30/2022	701 CHESTER WAY HILLSBOROUGH CA 94010 SAN MATEO COUNTY	Hillsborough

Name	Business Name	License Number	License Status	Issuance Date	Expiration Date	Address	City
PALMIERI, JOSEPH	PALMIERI PEST CONTROL	9912	Clear	7/29/1998	6/30/2022	208 FIRST AVENUE REDWOOD CITY CA 94063 SAN MATEO COUNTY	Redwood City
STEWART, RICHARD NORMAN	CHIEF STEWARTS PEST CONTROL INC	8381	Clear	1/1/1989	6/30/2021	139 SANTIAGO AVENUE REDWOOD CITY CA 94061 SAN MATEO COUNTY	Redwood City
STEWART, RICHARD SCOTT	CHIEF STEWARTS PEST CONTROL INC	12099	Clear	10/7/10	6/30/22	139 SANTIAGO AVENUE REDWOOD CITY CA 94061 SAN MATEO COUNTY	Redwood City

Appendix 10

- Trash Subcommittee Attendance List – FY 2021/22
- Litter Work Group – Attendance List – FY 2021/22

Trash Subcommittee Meeting Attendance – FY 2021/22

Name	Agency	Phone	E-Mail	09/21/21	01/19/22	04/06/22
Tim Murray	City of Belmont	(650) 222-6460	tmurray@belmont.gov	X		X
Marcus Escobedo	City of Belmont	(650) 222- 6459	mescobedo@belmont.gov	X		
Reid Bogert	C/CAG	(650) 599-1433	rbogert@smcgov.org	X	X	X
Keegan Black	City of Brisbane	(415) 728-7986	kblack@ci.brisbane.ca.us	X		
Randy Breault	City of Brisbane	(415) 508-2131	rbreault@ci.brisbane.ca.us			
Rick Horne	City of Burlingame	(650) 558-7672	rhorne@burlingame.org		X	
Mike Heathcote	City of Burlingame	(650) 558-7679	mheathcote@burlingame.org			
Jennifer Lee	City of Burlingame	(650) 558-7381	jlee@burlingame.org	X	X	X
Matt Dabney	City of Burlingame		mdabney@burlingame.org		X	
Louis Gotelli	Town of Colma	(650) 333-0295	louis.gotelli@colma.ca.gov			
Muneer Ahmed	Town of Colma	(650) 757-8894	Muneer.ahmed@colma.ca.gov		X	
Kelly Carroll	Town of Colma	(408) 921-4480	kellyc@csgengr.com	X	X	X
Jeff Fornesi	City of Daly City	(650) 991-5752	jfornesi@dalycity.org			
John Sanchez	City of Daly City	(650) 991-8265	jsanchez@dalycity.org	X	X	X
Sibely Calles	City of Daly City	(650) 991-8054	scalles@dalycity.org	X		
Leilani Ramos	City of Daly City		lramos@dalycity.org			
Michelle Daher	City of East Palo Alto	(650) 853-3197	mdaher@cityofepa.org			X
Greg Baeza	City of Foster City		gbaeza@fostercity.org		X	X
Taniela Mapa	City of Foster City		tmapa@fostercity.org		X	
Louis Sun	City of Foster City		lsun@fostercity.org		X	
Jennifer Chong	City of Half Moon Bay		jchong@hmbcity.com		X	X
Mark Lander	City of Half Moon Bay	(650) 522-2500	markl@csgengr.com	X	X	X
Nick Zigler	City of Half Moon Bay	(650) 522-2500	nickz@csgengr.com	X		
Brian Henry	City of Menlo Park	(650) 330-6799	bphenry@menlopark.org	X	X	
Scott Jaw	City of Menlo Park	(650) 330-6694	scjaw@menlopark.org	X	X	X
Mike Killigrew	City of Millbrae	(650) 259-2374	mkilligrew@ci.millbrae.ca.us			
Raymund Donguines	City of Pacifica	(650) 738-3767	donguinesr@ci.pacifica.ca.us		X	
Paul Lavorini	City of Pacifica		lavorinip@ci.pacifica.ca.us	X	X	X
Howard Young	Town of Portola Valley	(650) 851-1700 X214	hyoung@portolavalley.net			
Vicki Sherman	City of Redwood City	(650) 780-7472	vsherman@redwoodcity.org	X	X	X
Jason Claire	City of Redwood City	(650) 208-6365	jclaire@redwoodcity.org			

Trash Subcommittee Meeting Attendance – FY 2021/22

Name	Agency	Phone	E-Mail	09/21/21	01/19/22	04/06/22
Dennis Bosch	City of San Bruno		dbosch@sanbruno.ca.gov			
Robert Wood	City of San Bruno	(650) 616-7046	rwood@sanbruno.ca.gov			
Ted Chapman	City of San Bruno	(650) 616-7169	TChapman@sanbruno.ca.gov	X	X	X
Vatsal Patel	City of San Carlos	(650) 802-4202	vpatel@cityofsancarlos.org	X	X	X
Sarah Scheidt	City of San Mateo	(650) 522-7385	sscheidt@cityofsanmateo.org			
Rick Pina	City of San Mateo	(650) 522-7373	rpina@cityofsanmateo.org			
Sven Edlund	City of San Mateo	(650) 522-7342	sedlund@cityofsanmateo.org	X	X	X
Brad Harms	City of San Mateo		bharms@cityofsanmateo.org			
Siliva Pa'uli	City of San Mateo		spauli@cityofsanmateo.org		X	X
Andrew Wemmer	City of So. San Francisco	(650) 829-3883	andrew.wemmer@ssf.net	X	X	X
Thomas Siphongsay	City of So. San Francisco	(650) 829-3882	thomas.siphongsay@ssf.net			
Daniel Garza	City of So. San Francisco	(650) 829-3880	daniel.garza@ssf.net			
Julie Casagrande	County of San Mateo - DPW	(650) 599-1457	jcasagrande@co.sanmateo.ca.us	X	X	X
John Allan	County of San Mateo	(650) 363-4071	jallan@smcgov.org	X		X
Sultan Henson	County of San Mateo		shenson@smcgov.org			X
Lillian Clark	County of San Mateo		lclark@co.sanmateo.ca.us			
Kim Springer	County of San Mateo		kspringer@smcgov.org			
Kevin Lu	County of San Mateo	(650) 363-4698	khlu@smcgov.org			
Selena Gonzalez	County of San Mateo	(650) 599-1490	sgonzalez1@smcgov.org			X
Ian Hull	ERM	(925) 708-0650	hulli@samtrans.com			
Carolyn Critz	ERM		carolyn.critz@erm.com	X	X	
Chris Sommers	EOA, Inc.	(510) 832-2852 X109	csommers@eoainc.com	X	X	X
John Fusco	EOA, Inc.	(510) 832-2852 X130	jrfusco@eoainc.com	X	X	X
Kristin Kerr	EOA, Inc.	(510) 832-2852 X122	kakerr@eoainc.com			
Peter Schultze-Allen	EOA, Inc.	(510) 832-2852 X128	pschultze-allen@eoainc.com			X
No. Attending				23	26	24

San Mateo Countywide Water Pollution Prevention Program (SMCWPPP)

Litter Work Group - 2021/22 - Attendance Record

Name (e-mail)	Phone	Agency	11/17/21
Reid Bogert rbogert@smcgov.org	650-599-1419	CCAG/SMCWPP	X
Diane Lynn dlynn@belmont.gov	650-595-7425	City of Belmont	X
Marcus Escobedo mescobedo@belmont.gov			
Julie Freitas jfreitas@belmont.gov	650-595-7425		
Keegan Black kblack@ci.brisbane.ca.gov	415-508-2131	City of Brisbane	X
Jennifer Lee jlee@burlingame.org	650-558-7381	City of Burlingame	X
Rick Horne rhorne@burlingame.org	650-558-7672		X
Michael Heathcote mheathcote@burlingame.org			
Louis Gotelli lgotelli@colma.ca.gov		Town of Colma	X
Nick Zigler ziglern@csgengr.com	650-522-2538		
Maziar Bozoginia mbozoginia@hmbcity.com		Half Moon Bay	X
Kelly Carroll kellyc@csgengr.com	408-921-4480		
Leilani Ramos lramos@dalycity.org		City of Daly City	
Ben Zarrabi bzarrabi@cityofepa.org		City of East Palo Alto	X
Greg Baeza gbaeza@fostercity.org		City of Foster City	X
Laura Galli lgalli@fostercity.org			
Allen Smith asmith@fostercity.org	Taniela Mapa		X
Gary Francis gfrancis@hillsborough.net		Town of Hillsborough	
Brian Henry bhenry@menlopark.org	Scott Jaw	City of Menlo Park	X
Andrea Pappajohn apappajohn@ci.millbrae.ca.us		City of Millbrae	X
Vicki Sherman vsherman@redwoodcity.ca.us		City of Redwood City	X
Ted Chapman tchapman@sanbruno.ca.gov		City of San Bruno	X
Vatsal Patel vpatel@cityofsancarlos.org		City of San Carlos	X
Sven Edlund sedlund@cityofsanmateo.org		City of San Mateo	X
Siliva Pa'uli silivapauli@gmail.com			X

San Mateo Countywide Water Pollution Prevention Program (SMCWPPP)

Litter Work Group - 2021/22 - Attendance Record

Name (e-mail)	Phone	Agency	11/17/21
Andrew Wemmer Andrew.Wemmer@ssf.net Daniel Garza daniel.garza@ssf.net	650-829-3883	City of South SF	X
John Allan jjallan@smcgov.org Eun-Soo Lim eulim@smcgov.org Kevin Lu klu@smcgov.org Lillian Clark lclark@smcgov.org Prabhyot Khangura pkhangura@smcgov.org Ying Sham ysham@smchousing.org Julie Casagrande jcasagrande@smcgov.org	650-599-1447 650-599-1457	County of San Mateo Office of Sustainability County of San Mateo County of San Mateo Department of Housing County of San Mateo Public Works	X
Julia Au jau@rethinkwaste.org Joe La Mariana jlamariana@rethinkwaste.org	650-802-3509	Rethink Waste	X
Mia Rossi mrossi@recology.com Yvette Madera ymadera@recology.com	650-533-3504 650-598-8242	Recology-SM County	
Monica Devincenzi mdevincenzi@republicservices.com Nicole Lee nlee@republicservices.com Jessica Chen jchen@republicservices.com	650-756-1130 x224 415-604-9015	Republic Services RS - Daly City	X
Susan Kennedy susan@ssfscavenger.com Teresa Montgomery teresa@ssfscavenger.com	925-437-2510 650-589-4020	South SF Scavenger	X
Chris Sommers csommers@eoainc.com Peter Schultze-Allen pschultze-allen@eoainc.com	510-832-2852 x 109 510-832-2852 x 128	EOA Inc.	X X
Hardeep Takhar		Caltrans	X

Appendix 11

- Updated Control Measures Plan for PCBs and Mercury in San Mateo County Stormwater Runoff, SMCWPPP, September 30, 2022

Updated Control Measures Plan for PCBs and Mercury in San Mateo County Stormwater Runoff



September 30, 2022

TABLE OF CONTENTS

TABLE OF CONTENTS	i
List of Abbreviations	ix
1.0 Introduction	1
2.0 Summary of Permit Requirements.....	3
3.0 Summary of Control Measures	4
3.1. Source Property Identification and Abatement	4
Source Property Investigation and Referral Process.....	4
Review of Contaminated Site Cleanups (Potential Self-Abatements).....	5
3.2. Green Infrastructure and Treatment Control Measures.....	6
Green Infrastructure	6
Trash Full Capture Systems	7
3.3. Municipal O&M Activities that Potentially Remove Sediments with PCBs and/or Mercury	8
3.4. Managing PCBs in Building Materials.....	9
3.5. Managing PCBs in Storm Drain or Roadway Infrastructure	12
3.6. Diversions of Urban Runoff to Wastewater Treatment Facilities	12
3.7. Addressing Illegal Dumping.....	13
3.8. Mercury Reduction via Hazardous Waste Collection Programs.....	13
4.0 Existing and Planned Control Measures.....	14
4.1. Town of Atherton	15
Watershed Management Areas	15
Existing and Planned Control Measures Summary	15
Source Property Investigation.....	16
Green Infrastructure	16
Other PCBs and Mercury Controls	16
4.2. City of Belmont.....	17
Watershed Management Areas	17
Existing and Planned Control Measures Summary	17
Source Property Investigation.....	18
Green Infrastructure	18
Municipal Operation and Maintenance Practices.....	19
Other PCBs and Mercury Controls	19
4.3. City of Brisbane	20
Watershed Management Areas	20
Existing and Planned Control Measures Summary	20
Source Property Investigation.....	21

Updated Control Measure Plan for PCBs & Mercury in San Mateo County Stormwater Runoff (September 2022)

Green Infrastructure21

Municipal Operation and Maintenance Practices.....21

Other PCBs and Mercury Controls22

4.4. City of Burlingame.....23

 Watershed Management Areas23

 Existing and Planned Control Measures Summary23

 Source Property Investigation.....24

 Green Infrastructure24

 Municipal Operation and Maintenance Practices.....25

 Other PCBs and Mercury Controls26

4.5. Town of Colma27

 Watershed Management Areas27

 Existing and Planned Control Measures Summary27

 Source Property Investigation.....27

 Green Infrastructure28

 Municipal Operation and Maintenance Practices.....28

 Other PCBs and Mercury Controls29

4.6. City of Daly City30

 Watershed Management Areas30

 Existing and Planned Control Measures Summary30

 Source Property Investigation.....31

 Green Infrastructure31

 Municipal Operation and Maintenance Practices.....31

 Other PCBs and Mercury Controls32

4.7. City of East Palo Alto33

 Watershed Management Areas33

 Existing and Planned Control Measures Summary33

 Source Property Investigation.....34

 Green Infrastructure34

 Large Full Trash Capture Systems35

 Other PCBs and Mercury Controls36

4.8. City of Foster City37

 Watershed Management Areas37

 Existing and Planned Control Measures Summary37

 Source Property Investigation.....37

 Green Infrastructure37

 Large Full Trash Capture Systems38

Updated Control Measure Plan for PCBs & Mercury in San Mateo County Stormwater Runoff (September 2022)

Other PCBs and Mercury Controls	39
4.9. Town of Hillsborough	40
Watershed Management Areas	40
Existing and Planned Control Measures Summary	40
Source Property Investigation.....	40
Green Infrastructure	40
Other PCBs and Mercury Controls	41
4.10. City of Menlo Park.....	42
Watershed Management Areas	42
Existing and Planned Control Measures Summary	42
Source Property Investigation.....	42
Green Infrastructure	43
Municipal Operation and Maintenance Practices.....	44
Other PCBs and Mercury Controls	45
4.11. City of Millbrae.....	46
Watershed Management Areas	46
Existing and Planned Control Measures Summary	46
Source Property Investigation.....	46
Green Infrastructure	47
Large Full Trash Capture Systems	47
Municipal Operation and Maintenance Practices.....	48
Other PCBs and Mercury Controls	49
4.12. Town of Portola Valley	50
Watershed Management Areas	50
Existing and Planned Control Measures Summary	50
Source Property Investigation.....	50
Green Infrastructure	50
Other PCBs and Mercury Controls	51
4.13. City of Redwood City.....	52
Watershed Management Areas	52
Existing and Planned Control Measures Summary	52
Source Property Investigation.....	54
Green Infrastructure	54
Municipal Operation and Maintenance Practices.....	55
Other PCBs and Mercury Controls	57
4.14. City of San Bruno.....	59
Watershed Management Areas	59

Updated Control Measure Plan for PCBs & Mercury in San Mateo County Stormwater Runoff (September 2022)

Existing and Planned Control Measures Summary	59
Source Property Investigation.....	59
Green Infrastructure	60
Municipal Operation and Maintenance Practices.....	61
Other PCBs and Mercury Controls	62
4.15. City of San Carlos.....	63
Watershed Management Areas	63
Existing and Planned Control Measures Summary	63
Source Property Investigation.....	63
Green Infrastructure	65
Municipal Operation and Maintenance Practices.....	66
Other PCBs and Mercury Controls	67
4.16. City of San Mateo.....	68
Watershed Management Areas	68
Existing and Planned Control Measures Summary	68
Source Property Investigation.....	69
Green Infrastructure	70
Large Full Trash Capture Systems	71
Municipal Operation and Maintenance Practices.....	72
Other PCBs and Mercury Controls	73
4.17. Unincorporated San Mateo County	74
Watershed Management Areas	74
Existing and Planned Control Measures Summary	74
Source Property Investigation.....	74
Green Infrastructure	76
Municipal Operation and Maintenance Practices.....	77
Other PCBs and Mercury Controls	78
4.18. City of South San Francisco	79
Watershed Management Areas	79
Existing and Planned Control Measures Summary	80
Source Property Investigation.....	81
Green Infrastructure	81
Municipal Operation and Maintenance Practices.....	83
Other PCBs and Mercury Controls	84
4.19. Town of Woodside	85
Watershed Management Areas	85
Existing and Planned Control Measures Summary	85

Updated Control Measure Plan for PCBs & Mercury in San Mateo County Stormwater Runoff (September 2022)

Source Property Investigation.....85
Green Infrastructure85
Other PCBs and Mercury Controls86
5.0 PCBs and Mercury Loads Reduced.....87
5.1. Summary of Loads Reduced Accounting Methodology87
Source Property Identification and Abatement87
Green Infrastructure and Treatment Controls.....88
Enhanced Operation and Maintenance Activities – Increased Inlet Cleanouts88
5.2. PCBs Loads Reduced89
Preliminary Estimated PCBs Loads Reduced from July 1, 2013 through June 30, 202289
5.3. Mercury Loads Reduced.....92
Preliminary Estimated Mercury Loads Reduced from July 1, 2013 through June 30, 2022.....92
Mercury Mass Collected via Countywide Hazardous Waste Collection Program95
6.0 Discussion and Next Steps97
7.0 References99

List of Tables

Table 4.1. Atherton WMAs and associated land uses.15
Table 4.2. Existing (E) and planned (P) PCBs and mercury control measures in Atherton WMAs15
Table 4.3 Land area in the Atherton WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}16
Table 4.4. Belmont WMAs and associated land uses.17
Table 4.5. Existing (E) and planned (P) PCBs and mercury control measures in Belmont WMAs.17
Table 4.6 Land area in the Belmont WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}18
Table 4.7. Extent of land area in City of Belmont WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}19
Table 4.8. Brisbane WMAs and associated land uses.20
Table 4.9. Existing (E) and planned (P) PCBs and mercury control measures in Brisbane WMAs.20
Table 4.10 Land area in the Brisbane WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}21
Table 4.11. Extent of land area in City of Brisbane WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}22
Table 4.12. Burlingame WMAs and associated land uses.23
Table 4.13. Existing (E) and planned (P) PCBs and mercury control measures in Burlingame WMAs.24
Table 4.14 Land area in Burlingame WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}25
Table 4.15. Extent of land area in City of Burlingame WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}26
Table 4.16. Colma WMAs and associated land uses.....27

Updated Control Measure Plan for PCBs & Mercury in San Mateo County Stormwater Runoff (September 2022)

Table 4.17. Existing (E) and planned (P) PCBs and mercury control measures in Colma WMAs.....	27
Table 4.18 Land area in Colma WMAs treated by GI built from July 1, 2013 to June 30, 2022. ^{1,2,3}	28
Table 4.19. Extent of land area in Town of Colma WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices). ^{1,2}	29
Table 4.20. Daly City WMAs and associated land uses.....	30
Table 4.21 Existing (E) and planned (P) PCBs and mercury control measures in Daly City WMAs.....	30
Table 4.22 Land area in the Daly City WMAs treated by GI built from July 1, 2013 to June 30, 2022. ^{1,2,3}	31
Table 4.23. Extent of land area in City of Daly City WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices). ^{1,2}	32
Table 4.24. East Palo Alto WMAs and associated land uses.....	33
Table 4.25. Existing (E) and planned (P) PCBs and mercury control measures in East Palo Alto WMAs.....	34
Table 4.26. Land area in East Palo Alto WMAs treated by GI built from July 1, 2013 to June 30, 2022. ^{1,2,3}	35
Table 4.27. Extent of land area in City of East Palo Alto WMAs that is addressed by publicly owned large full trash capture systems [i.e., Gross Solids Removal Devices (GSRD)]. ^{1,2,3}	36
Table 4.28. Foster City WMAs and associated land uses.....	37
Table 4.29. Existing (E) and planned (P) PCBs and mercury control measures in Foster City WMAs.....	37
Table 4.30 Land area in Foster City WMAs treated by GI built from July 1, 2013 to June 30, 2022. ^{1,2,3}	38
Table 4.31. Extent of land area in City of Foster City WMAs that is addressed by publicly owned large full trash capture systems [i.e., Hydrodynamic Separators (HDS)]. ^{1,2,3}	39
Table 4.32. Hillsborough WMAs and associated land uses.	40
Table 4.33. Existing (E) and planned (P) PCBs and mercury control measures in Hillsborough WMAs.	40
Table 4.34 Land area in Hillsborough WMAs treated by GI built from July 1, 2013 to June 30, 2022. ^{1,2,3}	41
Table 4.35. Menlo Park WMAs and associated land uses.	42
Table 4.36. Existing (E) and planned (P) PCBs and mercury control measures in Menlo Park WMAs.	43
Table 4.37 Land area in Menlo Park WMAs treated by GI built from July 1, 2013 to June 30, 2022. ^{1,2,3}	44
Table 4.38. Extent of land area in City of Menlo Park WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices). ^{1,2}	45
Table 4.39. Millbrae WMAs and associated land uses.	46
Table 4.40. Existing (E) and planned (P) PCBs and mercury control measures in Millbrae WMAs.	46
Table 4.41 Land area in Millbrae WMAs treated by GI built from July 1, 2013 to June 30, 2022. ^{1,2,3}	47
Table 4.42. Extent of land area in City of Millbrae WMAs that is addressed by publicly owned large full trash capture systems [i.e., Gross Solids Removal Devices (GSRD)]. ^{1,2,3}	48
Table 4.43. Extent of land area in City of Millbrae WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices). ^{1,2}	49
Table 4.44. Portola Valley WMAs and associated land uses.	50
Table 4.45. Existing (E) and planned (P) PCBs and mercury control measures in Portola Valley WMAs.	50
Table 4.46 Land area in Portola Valley WMAs treated by GI built from July 1, 2013 to June 30, 2022. ^{1,2,3}	51
Table 4.47. Redwood City WMAs and associated land uses.	52

Updated Control Measure Plan for PCBs & Mercury in San Mateo County Stormwater Runoff (September 2022)

Table 4.48. Existing (E) and planned (P) PCBs and mercury control measures in Redwood City WMAs.....	53
Table 4.49 Land area in Redwood City WMAs treated by GI built from July 1, 2013 to June 30, 2022. ^{1,2,3}	55
Table 4.50. Extent of land area in City of Redwood City WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices). ^{1,2}	56
Table 4.51. San Bruno WMAs and associated land uses.	59
Table 4.52. Existing (E) and planned (P) PCBs and mercury control measures in San Bruno WMAs.	60
Table 4.53 Land area in San Bruno WMAs treated by GI built from July 1, 2013 to June 30, 2022. ^{1,2,3}	61
Table 4.54. Extent of land area in City of San Bruno WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices). ^{1,2}	62
Table 4.55. San Carlos WMAs and associated land uses.	63
Table 4.56. Existing (E) and planned (P) PCBs and mercury control measures in San Carlos WMAs.	64
Table 4.57 Land area in San Carlos WMAs treated by GI built from July 1, 2013 to June 30, 2022. ^{1,2,3}	66
Table 4.58. Extent of land area in City of San Carlos WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices). ^{1,2}	67
Table 4.59. City of San Mateo WMAs and associated land uses.	68
Table 4.60. Existing (E) and planned (P) PCBs and mercury control measures in City of San Mateo WMAs.	69
Table 4.61 Land area in City of San Mateo WMAs treated by GI built from July 1, 2013 to June 30, 2022. ^{1,2,3}	71
Table 4.62. Extent of land area in City of San Mateo WMAs that is addressed by publicly owned large full trash capture systems [i.e., Debris Separating Baffle Boxes (DSBBs)]. ^{1,2,3}	72
Table 4.63. Extent of land area in City of San Mateo WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices). ^{1,2}	73
Table 4.64. Unincorporated County of San Mateo WMAs and associated land uses.	74
Table 4.65. Existing (E) and planned (P) PCBs and mercury control measures in unincorporated San Mateo County WMAs.	75
Table 4.66 Land area in Unincorporated County of San Mateo WMAs treated by GI built from July 1, 2013 to June 30, 2022. ^{1,2,3}	77
Table 4.67. Extent of land area in Unincorporated San Mateo County WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices). ^{1,2}	78
Table 4.68. City of South San Francisco WMAs and associated land uses.	79
Table 4.69. Existing (E) and planned (P) PCBs and mercury control measures in South San Francisco WMAs.....	80
Table 4.70 Land area in City of South San Francisco WMAs treated by GI built from July 1, 2013 to June 30, 2022. ^{1,2,3}	82
Table 4.71. Extent of land area in City of South San Francisco WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices). ^{1,2}	83
Table 4.72. Woodside WMAs and associated land uses.....	85
Table 4.73. Existing (E) and planned (P) PCBs and mercury control measures in Woodside WMAs.....	85
Table 5.1. Preliminary estimates of PCBs loads reduced by San Mateo County Permittees from July 1, 2013 through June 30, 2022 (FY 2013/14 through FY 2021/22).	90

Updated Control Measure Plan for PCBs & Mercury in San Mateo County Stormwater Runoff (September 2022)

Table 5.2. Preliminary estimates of PCBs loads reduced in San Mateo County by control measure category from July 1, 2013 through June 30, 2022 (FY 2013/14 through FY 2021/22). 91

Table 5.3. Preliminary estimates of mercury loads reduced by San Mateo County Permittees from July 1, 2013 through June 30, 2022 (FY 2013/14 through FY 2021/22). 93

Table 5.4. Preliminary estimates of mercury loads reduced in San Mateo County by control measure category from July 1, 2013 through June 30, 2022 (FY 2013/14 through FY 2021/22)..... 94

Table 5.5. Estimated mercury mass collected via the San Mateo County Health Department's Household Hazardous Waste (HHW) and Very Small Quantity Generator Business Collection (VSQG) programs. 96

List of Figures

Figure 4.1. Drainage catchment and storm drain lines for the Redwood Shores Ecological Reserve Stormwater Detention Basin in Redwood City (shown in blue). Point A is the pump station discharge pipe location. Point B is the gravity fed discharge pipe location. Both discharge pipes empty to the Steinberger Slough..... 58

List of Appendices

Appendix A – Maps for each San Mateo County Permittee showing WMAs and GI/LID facilities

Appendix B – Descriptions of Land Uses Referenced in this Report

LIST OF ABBREVIATIONS

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 for Water Quality in San Francisco Bay
SMCWPPP	San Mateo Countywide Water 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 (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 San Francisco Bay Regional Water Quality Control Board (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 stipulate 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 first Bay Area Municipal Stormwater National Pollutant Discharge Elimination System (NPDES) Permit (Municipal Regional Permit, or 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) to the Bay. These pilot studies were intended to enhance the collective knowledge about the costs and benefits of different Best Management Practices (BMPs) to control PCBs and mercury.

The reissued 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 PCBs across the MRP 2.0 area by June 30, 2020). The strategies and BMPs that have been applied to meet the load reduction goals at a minimum include:

- Stormwater green infrastructure (GI);
- Trash control devices that remove sediments containing PCBs and/or mercury;
- Source property identification and referral for investigation and abatement; and
- Management of PCBs in building materials during demolition.

Permittees may also consider implementing additional types of controls to address the PCBs and mercury reduction goals, such as enhancements to municipal operation and maintenance (O&M) activities that remove sediments containing PCBs and/or mercury.

In compliance with Provisions C.11 and C.12, the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP), a program of the City/County Association of Governments (C/CAG) of San Mateo County, is continuing to work with San Mateo County municipal agencies to identify control measures for PCBs and mercury that reduce discharges from their MS4s. This plan documents the approaches taken and progress made to-date, including summaries of:

- The pertinent MRP 2.0 permit requirements;
- The types of control measures typically used to control PCBs and mercury discharges in stormwater runoff from local watersheds surrounding San Francisco Bay;
- Documentation of existing and planned PCBs and mercury control measures for each San Mateo County MRP 2.0 Permittee;

Updated Control Measure Plan for PCBs & Mercury in San Mateo County Stormwater Runoff (September 2022)

- Updated estimates of the reductions in PCBs and mercury loads from San Mateo County stormwater runoff during the MRP 2.0 term that have been quantified to-date, calculated using the interim accounting methodology described later (see Section 5.0); and
- Next steps.

This plan provides an update to the plan (SMCWPPP 2021b) that was submitted with the FY 2020/21 Annual Report in September 2021, including updated estimates of the PCBs and mercury load reductions achieved in San Mateo County this permit term (including a period immediately preceding the permit term, as explained later, see Section 4.0) that have been quantified to-date. Consistent with the Provision C.11/12 requirements, the information contained within this plan will continue to be updated periodically during MRP 2.0 as new information is developed about control measures and associated pollutant load reductions.

2.0 SUMMARY OF PERMIT REQUIREMENTS

MRP 2.0 Provisions C.11.a.iii. and C.12.a.iii. required Permittees to submit with their FY 2015/16 Annual Reports a prioritized list of watersheds and management areas where control measures for PCBs and mercury are currently implemented or will be implemented during the term of the permit along with an implementation schedule (accomplished by SMCWPPP 2016b).¹ Permittees were also required to provide the monitoring data and other information used to select the management areas. In addition to the list of management areas, Permittees were also required to report on the following:

- The number, type, and locations and/or frequency (if applicable) of control measures;
- A cumulative listing of all potentially PCBs-contaminated sites Permittees have discovered and referred to the Regional Water Board to-date, with a brief summary description of each site and where to obtain further information;
- The description, scope and start date of control 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.

In subsequent Annual Reports, Permittees are required to provide updates to the initial information presented with the FY 2015/16 Annual Report.

The MRP also requires that Permittees demonstrate and report on achievement of PCBs load reductions and ancillary load reduction benefits for mercury during the term of the permit. As part of this requirement to report load reductions, MRP Provisions C.11/12.b., Assess Mercury/PCBs Load Reductions from Stormwater, required Permittees to submit with their FY 2015/16 Annual Report for Executive Officer approval an assessment methodology (which was referred to as the interim accounting methodology (BASMAA 2017), that updates the load reduction accounting system outlined in the MRP 2.0 factsheet. Permittees were required to use the assessment methodology to quantify in a technically sound manner PCBs and mercury loads reduced through implementation of pollution prevention and treatment control measures, including source control, stormwater treatment, GI, and other measures. Beginning with their FY 2016/17 Annual Report, Permittees were required to report on the use of the methodology to demonstrate progress toward achieving the PCBs and mercury load reductions required this permit term (accomplished by SMCWPPP 2017b), with updates provided in subsequent Annual Reports (accomplished by SMCWPPP 2018b, SMCWPPP 2019b, SMCWPPP 2020b, SMCWPPP 2021b, and this report).

¹The MRP also required submittal of an initial progress report by April 1, 2016 (accomplished by SMCWPPP 2016a).

3.0 SUMMARY OF CONTROL MEASURES

Permittees have implemented a variety of control measures since the development of PCBs and mercury urban stormwater loading estimates incorporated into the TMDLs. Control measures were implemented to reduce PCBs and/or mercury in stormwater and/or other impacts of stormwater runoff. The control measures that have a direct benefit towards reducing the impacts of PCBs and mercury on the Bay are documented in this plan.

The types of control measures implemented to control PCBs and mercury in stormwater runoff 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 release 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 production of these organic compounds being banned in the 1970s and the tight regulation of PCBs 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 that intercept the pollutant before it is discharged to a receiving water body. The control measure types that fall into this category include source property abatement, enhanced street sweeping, MS4 and flood control facility maintenance, mercury device recycling, and the control of PCBs-containing material during building demolition/renovation.
- **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, GI, and diversions of stormwater to Publicly Owned Treatment Works (POTWs).

Control measures needed to address PCBs and mercury load reduction criteria included in MRP 2.0 are currently under development by Permittees based on continued evaluations of sources of these contaminants and load reduction benefits associated with existing control measures. To the extent possible with the available information, control measures implemented to-date and those planned for implementation within each WMA during the term of MRP 2.0 are summarized in Section 4.0, consistent with MRP requirements.

Descriptions of each control measure type that Permittees may implement or cause to be implemented by other responsible parties to control PCBs and/or mercury are provided below.

3.1. Source Property Identification and Abatement

Source Property Investigation and Referral Process

PCBs and mercury source properties discharge these pollutants to the MS4s. One typical mechanism is for on-site contaminated surface soils to be mobilized by stormwater runoff, wind and/or vehicles and enter on-site or off-site storm drains. Identification and subsequent abatement of these properties

and/or focused control measure implementation in the public ROW around source properties can provide an opportunity for PCBs and mercury stormwater load reductions. Reductions occur through the abatement of properties via available mechanisms, including referrals to the Regional Water Board or through enforcement actions brought against property owners by Permittees.

San Mateo County MRP Permittees continue to implement a program to attempt to identify source properties in priority WMAs. These investigations typically include the following tasks:

- 1) Property records and aerial photography review;
- 2) Public ROW surveys and/or property inspections;
- 3) Private property and public ROW soil/sediment sampling; and
- 4) Reporting and planning/identifying control measures (including planning referrals).

As source properties are identified, information regarding pollutant concentrations observed, evidence of transport to the MS4, property ownership, previous stormwater violations, and any other pertinent information is documented. Additionally, the location and geographical extent of the property is delineated in GIS to facilitate the calculation of PCBs and mercury load reductions.

In October 2018, SMCWPPP submitted two source property referrals (both in San Carlos) to the Regional Water Board (Section 4.15). In addition, SMCWPPP and San Mateo County Permittees will continue attempting to identify source properties for referral to the Regional Water Board, based on the evaluation of the results of the WY 2019 POC monitoring program and other appropriate data, as it becomes available.

SMCWPPP's efforts to identify source properties in San Mateo County are described in the Urban Creek Monitoring Reports (UCMRs) submitted annually in March (SMCWPPP 2017a, 2018a, 2019a, 2020a, 2021a, and 2022).²

Review of Contaminated Site Cleanups (Potential Self-Abatements)

In addition to the source property investigations and referral process described above, SMCWPPP has also been evaluating opportunities to take credit for PCBs and mercury loads avoided due to contaminated site cleanups in San Mateo County that were initiated during 2005 or later, since these cleanups are assumed to reduce urban runoff pollutant loads relative to the PCBs TMDL baseline urban runoff load. The cleanups are referred to as "self-abatements" and are typically a result of enforcement actions with cleanup oversight by federal, state and local regulatory agencies, including United States Environmental Protection Agency (USEPA), California Department of Toxic Substance Control (DTSC), the Regional Water Board, and/or local municipal agencies. In addition, cleanups completed during the MRP 2.0 permit term should result in credit towards MRP 2.0 load reduction requirements. Investigation of contaminated site cleanups may also lead to opportunity to identify additional PCBs source properties that could be referred to the Regional Water Board for further investigation and abatement, either because cleanup at a site was never completed, or because the cleanup standards applied were not adequate relative to TMDL goals for reducing pollutant loads in stormwater runoff.

Regional Water Board staff has compiled a list of contaminated sites that were or are targeted for cleanup of soil and/or groundwater impacts under USEPA, DTSC, Regional Water Board, or local

² An Integrated Monitoring Report was submitted in lieu of a UCMR in March 2020.

municipal agency oversight. The list was compiled primarily from a review of online databases, including DTSC's Envirostor and the State Water Resource Control Board's GeoTracker, and targeted sites that may have been associated with PCBs. The purpose in compiling this list was so that Regional Water Board staff could follow-up with the oversight agencies to ensure stormwater runoff concerns were or will be adequately addressed as part of the cleanups. The list has been updated periodically as new information becomes available. SMCWPPP is reviewing the latest versions of the Regional Water Board list to help identify PCBs and mercury cleanup sites in San Mateo County. SMCWPPP is also in the process of reviewing online databases (Envirostor and GeoTracker) to review site histories and cleanup records, and compile the information needed to determine the cleanup status of the site, justify calculating any pollutant load reductions for the site cleanup, and document the data inputs needed to calculate loads avoided. The following information is being collected, as available:

- Area of the site;
- Current cleanup status;
- Date of cleanup;
- Evidence of PCBs on the site prior to cleanup (i.e., pre-cleanup PCBs concentrations in soils or groundwater);
- Cleanup/abatement methods;
- Evidence of adequate PCBs cleanup at the site (e.g., post-cleanup PCBs concentrations in soils or groundwater);
- Available evidence to justify designation as a potential PCBs source property for referral to Regional Water Board; and
- Documentation of any follow-up needed at the site.

3.2. Green Infrastructure and Treatment Control Measures

Green Infrastructure

Green infrastructure (GI) and other treatment controls may be installed in roadway and storm drain infrastructure in the public ROW to treat stormwater runoff (e.g., construction of green streets and other regional stormwater capture facilities). GI may be retrofitted into existing infrastructure or included as part of new infrastructure capital improvement projects (e.g., transportation improvements such as street projects). In addition, applicable public and private properties undergoing new or redevelopment are subject to MRP requirements to treat stormwater via GI/LID techniques or equivalent. Installation of GI facilities on private property or public lands in San Mateo County continues to improve stormwater quality and help reduce PCBs and mercury loads. GI facilities include infrastructure that uses vegetation, soils, and natural processes to manage water and create healthier urban environments. Examples of GI include bioretention, LID, green/complete streets, and other systems that generally use the natural filtration or infiltration of stormwater.

MRP 2.0 requires that a 370 grams/year PCBs load reduction is achieved in San Mateo County by the end of this permit term. Of this, at least 15 grams/year must be achieved via GI. These requirements have been met, as documented in SMCWPPP's FY 2019/20 Annual Report.

For the purposes of tracking and crediting pollutant load reductions achieved through GI and stormwater treatment, During FY 2015/16, SMCWPPP staff worked with San Mateo County MRP Permittee staff to

begin developing a database of existing and planned public and private GI and stormwater treatment projects in San Mateo County, including GI/LID measures at redevelopment sites and GI installed in the public ROW during infrastructure projects (SMCWPPP 2016b). The database includes existing and planned GI and treatment facilities constructed in 2005 or later since these facilities are assumed to reduce urban runoff pollutant loads relative to the PCBs TMDL baseline urban runoff load. In addition, 2005 was the year that San Mateo County's municipal stormwater permit was amended to include more stringent Provision C. 3 requirements; thus most new or redevelopment projects constructed in 2005 or later include stormwater treatment.

The types of information in the database of existing and planned public and private GI and stormwater treatment projects in San Mateo County include the following:

- Project name
- Description of GI and stormwater treatment system(s)
- Location - street address or location description and coordinates
- Whether the facility is located on private property or in public ROW
- Area treated by facility (acres)
 - For GI/LID at redevelopment or new developments sites, this is generally assumed to be the project area
 - For Green Street or other retrofits in public ROW, estimated drainage area to facility
- Hydraulic sizing criteria
- Date of construction
 - Existing facilities: date of construction completion (e.g., initial inspection sign-off)
 - Planned facilities: estimated construction completion date

Beginning in FY 2016/17, SMCWPPP has worked with municipal staff each year to update the GI database with available new or revised information. More recently SMCWPPP developed a web-based GI Tracking Tool that has incorporated and replaced the original database. The tool is available via the Countywide Program's website at www.flowstobay.org/ssmp. See SMCWPPP's FY 2021/22 Annual Report for more information. For each San Mateo County Permittee with urban areas that drain to San Francisco Bay, a summary of the information gathered to-date on existing and planned GI and stormwater treatment facilities is presented in Section 4.0 of this report. Approximate load reductions calculated for all GI and stormwater treatment implemented in San Mateo County during the MRP 2.0 permit term are reported in Section 5.0.

The information in this section and Section 4.0 also helps to fulfill the requirement in MRP Provision C.3.j.iv. to report on development and implementation of methods to track and report implementation of GI.

Trash Full Capture Systems

Trash full capture systems are devices or series of devices that trap all particles retained by a 5mm mesh screen and have a design treatment capacity of not less than the peak flow rate resulting from a one-year, one-hour, storm in the tributary drainage catchment area. Examples of full capture systems include

storm drain inlet screening devices that treat relatively small areas to hydrodynamic separators and netting devices treating hundreds or thousands of acres.

To-date, a number of large trash full capture system have been retrofitted into the MS4 in urban areas of San Mateo County that drain to the. A summary of the information gathered to-date on these trash full capture systems is presented in Section 4.0 of this report. Preliminary load reductions estimated for these systems are included in Section 5.0.

3.3. Municipal O&M Activities that Potentially Remove Sediments with PCBs and/or Mercury

SMCWPPP is working with San Mateo County MRP Permittees to continue evaluating new or enhanced municipal O&M activities that may remove sediments containing PCBs and/or mercury. SMCWPPP is tracking actions implemented in 2005 or later since these actions are assumed to reduce urban runoff pollutant loads relative to the PCBs TMDL baseline urban runoff load. The types of municipal O&M evaluated are described below. As part of this evaluation SMCWPPP has assessed whether new or enhanced municipal O&M activities were implemented or planned for implementation during the MRP 2.0 permit term.

Street Sweeping and Flushing

Most San Mateo County Permittees conduct street sweeping, which along with trash and debris also removes sediments and particle-bound pollutants such as PCBs and mercury to some extent. If enhancements are made by San Mateo County MRP Permittees to street sweeping programs that would increase PCBs and mercury removal from stormwater runoff, the associated pollutant load reductions will be documented.

In addition to traditional street sweeping, street flushing may also provide pollutant reduction benefits in stormwater runoff. Street flushing includes pressure washing and/or the use of water to flush streets of sediment, trash, and sediment-associated pollutants, then collecting and properly disposing of the water, sediments and pollutants. A street flushing pilot project was conducted in San Carlos during MRP 1.0 (CW4CB 2017b). However, additional street flushing projects have not occurred in San Mateo County under MRP 2.0. If street flushing projects are implemented by San Mateo County MRP Permittees in the future, pollutant load reductions associated with this control measure will be documented.

MS4 Line Flushing

Occasionally, opportunities present themselves to remove PCBs or mercury associated sediment deposited in MS4 lines. These opportunities typically do not occur often because the traditional MS4 is designed to convey stormwater (and associated sediments) effectively through the system. MS4 line flushing pilot projects have been conducted in the Bay Area, but not in San Mateo County to-date. If MS4 line flushing projects are implemented by San Mateo County MRP Permittees, load reductions associated with this control measure will be documented.

Storm Drain Inlet Maintenance

Municipalities periodically conduct storm drain inlet maintenance (e.g., clean-outs of catch basins). Most San Mateo County MRP Permittees inspect and maintain their inlets annually. Through these efforts, sediment, and organic material (and associated pollutants) are removed from the MS4. If enhancements

are made by San Mateo County MRP Permittees to inlet maintenance programs that would increase PCBs and mercury removal from stormwater runoff, the associated pollutant load reductions will be documented.

Channel and Pump Station Maintenance

San Mateo County MRP Permittees periodically remove sediment from storm drain channels and pump stations as part of their ongoing maintenance programs. As sediment and organic material are removed, sediment-associated pollutants such as PCBs and mercury are also removed. If enhancements are made by San Mateo County MRP Permittees to channel and pump station maintenance programs that would increase PCBs and mercury removal from stormwater runoff, the associated pollutant load reductions will be documented.

3.4. Managing PCBs in Building Materials

PCBs were used in many applications and materials in buildings, especially those constructed from about 1950 through 1980. MRP 1.0 required the implementation of a pilot project to assist in developing management practices that address legacy caulks containing PCBs. Permittees complied with this requirement by participating in a regional project led by the San Francisco Estuary Partnership (SFEP) that: 1) evaluated PCBs levels in caulk in buildings; and 2) developed preliminary BMPs, a Model Implementation Process, and associated model policies and ordinances to reduce or prevent the release of PCB-laden caulks to the environment during demolition of Bay Area buildings.

Building upon the requirements in MRP 1.0, MRP 2.0 Provision C.12.f requires Permittees to develop and implement or cause to be developed and implemented an effective protocol for managing materials with PCBs concentrations of 50 parts per million or greater in applicable structures³ at the time such structures undergo demolition, so that PCBs do not enter municipal storm drain systems. A Permittee is exempt from this requirement if it provided evidence acceptable to the Executive Officer in its FY 2016/17 Annual Report that the only buildings that existed pre-1980 within its jurisdiction were single-family residential and/or wood-frame buildings.

Permittees were required to develop a protocol by June 30, 2019 that includes each of the following components, at a minimum:

- The necessary authority to ensure that PCBs do not enter municipal storm drains from PCBs-containing materials in applicable structures at the time such structures undergo demolition;
- A method for identifying applicable structures prior to their demolition; and,
- Method(s) for ensuring PCBs are not discharged to the municipal storm drain from demolition of applicable structures.

By July 1, 2019 and thereafter, Permittees are required to:

- Implement or cause to be implemented the PCBs management protocol for ensuring PCBs are not discharged to municipal storm drains from demolition of applicable structures via vehicle track-out, airborne releases, soil erosion, or stormwater runoff; and,

³ Applicable structures are buildings built or remodeled from January 1, 1950 through December 31, 1980, with the following exemptions: single-family residential buildings, wood-framed buildings, and partial building demolitions.

Updated Control Measure Plan for PCBs & Mercury in San Mateo County Stormwater Runoff (September 2022)

- Develop an assessment methodology and data collection program to quantify in a technically sound manner PCBs loads reduced through implementation of the protocol for controlling PCBs during demolition of applicable structures.

On behalf of MRP Permittees, BASMAA conducted a multi-year regional project to assist MRP Permittees to address Provision C.12.f. The BASMAA project, which began in FY 2016/17 and was completed in March 2019, assisted Permittees in developing local programs to manage PCBs-containing materials during building demolition. It developed guidance materials, tools and training materials and conducted outreach. SMCWPPP actively participated in the project, including providing BASMAA's project manager.

At the outset of the project, a BASMAA Steering Committee was convened to provide project oversight and guidance during the project. The Steering Committee included BASMAA Directors, countywide stormwater program staff, and Permittee staff from various relevant municipal departments. The Steering Committee met periodically throughout the project. In addition, a project TAG, a small balanced advisory group formed from industry, regulatory, and Permittee representatives to provide review and input on selected project work products, was convened. The TAG was comprised of representatives from industry and state/federal regulatory agencies, and Permittees. Other efforts to engage key stakeholders included an industry stakeholder roundtable meeting (August 2017) and two larger stakeholder group meetings (December 2017 and May 2018) that included industry, regulatory and municipal representatives. During FY 2018/19, Permittees tailored the BASMAA products for local use, adopted the program (e.g., via local policy or ordinance), and trained local staff to implement the new program starting July 1, 2019.

Key BASMAA project deliverables provided to each Permittee to use as appropriate given local procedures and needs included:

- A protocol for pre-demolition building survey for priority PCBs-containing building materials;
- Model language for municipal adoption (e.g., ordinance) of the new program to manage PCBs materials during building demolition and model supporting staff report and resolution;
- CEQA strategy and model notice of exemption;
- Supplemental demolition permit model application materials, including forms, process flow charts, and applicant instructions; and
- An analysis to assist municipalities that pursue cost recovery.

Other project deliverables included:

- A coordination/communication strategy for the project;
- A technical memorandum summarizing any new information & decisions needed by BASMAA at outset, including an annotated table of regulatory drivers and relevant requirements;
- A technical memorandum with the state of the practice for identifying PCBs-containing building materials (developed to inform development of the pre-demolition building survey protocol listed below);
- Industry stakeholder outreach materials and a fact sheet for municipal staff;
- A spreadsheet tool used to develop the prioritized list of potential PCBs-containing building materials that the demolition program will focus on;

Updated Control Measure Plan for PCBs & Mercury in San Mateo County Stormwater Runoff (September 2022)

- A conceptual approach for an assessment methodology and data collection program to quantify PCBs loads reduced through managing PCBs-containing materials during building demolition.

During FY 2018/19, the BASMAA project concluded by conducting the following outreach and training tasks:

- Prepared training materials for municipal staff on adoption and implementation of the new program;
- Developed outreach materials and a standard presentation to inform industry stakeholders including developers, planning firms, urban planning non-governmental organizations, demolition firms, property owners, property managers, and realtors about the new program to manage PCBs in building materials during demolition;
- Using the above training materials, conducted training workshops (in-person and a webinar) for key municipal and countywide stormwater program staff;
- Conducted a webinar for industry stakeholders; and
- Developed a list of Bay Area opportunities, including contact information and dates, for municipal and/or stormwater program staff to conduct additional outreach to industry stakeholders using the above industry outreach materials.

In addition, during FY 2018/19 MRP Permittees worked together through the BASMAA Monitoring and Pollutants of Concern Committee (MPC) to begin developing a framework to comply with data collection/evaluation and reporting requirements under Provision C.12.f. As mentioned previously, these requirements include developing an assessment methodology and data collection program to quantify PCBs loads reduced through implementation of the new program. The preliminary regional process developed to-date includes the following steps:

1. The municipality informs demolition permit applicants that their projects are subject to the MRP Provision C.12.f requirements, necessitating, at a minimum, an initial screening for priority PCBs-containing materials.
2. For every demolition project, applicants complete and submit a version of BASMAA's model "PCBs Screening Assessment Form" (Screening Form) or equivalent to the municipality.
3. The municipality reviews the Screening Form to make sure it is filled out correctly and is complete and works with the applicant to correct any deficiencies.
4. The municipality then issues the demolition permit or equivalent, according to its procedures.⁴
5. For Applicable Structures only, the municipality submits completed Screening Forms and any supporting documents (consultant's report from PCBs building survey, QA/QC checklist, and lab reports) to its countywide program; forms for exempt sites need not be submitted. Forms should be submitted to the countywide programs electronically if feasible, and at a minimum annually, but quarterly is preferred.

⁴ Municipalities should require that applicants fill out and certify a Screening Form for every demolition. For non-Applicable Structures, applicants simply check the boxes, certify, and submit to municipality. Then the municipality can authorize the demolition (e.g., issue a demolition permit). In general, municipalities should have a completed and certified Screening Form before authorizing a demolition, unless they are a small community that is exempt or has some other arrangement with Regional Water Board staff. But there is no need to track non-Applicable Structures otherwise.

6. The countywide programs compile the completed Screening Forms and any supporting documents. The countywide program then works with the other MRP countywide programs through BASMAA to manage and evaluate the data, and to assist Permittees with associated MRP reporting requirements.

Permittees began implementing the program on July 1, 2019. The MRP stipulates a collective PCBs load reduction credit of 246.67 grams/year for San Mateo County Permittees, if all the Permittees implement a program consistent with the permit requirements. See Section 12 and Appendix 12 of SMCWPPP's FY 2021/22 Annual Report for more information including documentation provided per Provision C.12.f. reporting requirements.

3.5. Managing PCBs in Storm Drain or Roadway Infrastructure

Studies in areas outside of the Bay Area have shown that PCBs may be present in storm drain and/or roadway infrastructure due to their use in caulks and sealants in the mid to late 20th century. Provision C.12.e of MRP 2.0 requires Permittees to evaluate the presence of PCBs in caulks/sealants used in storm drain or roadway infrastructure in public ROWs by collecting samples of caulk and other sealants used in storm drains and between concrete curbs and street pavement. BASMAA completed a regional project to address this permit requirement on behalf of all MRP Permittees. The results of the study are documented in a project report that was submitted with SMCWPPP's FY 2017/18 Annual Report.

3.6. Diversions of Urban Runoff to Wastewater Treatment Facilities

The diversion of urban runoff (i.e., dry weather flows and/or stormwater runoff) to existing wastewater treatment facilities could potentially reduce PCBs and mercury loads to the Bay. A study was conducted in the City of San Carlos during MRP 1.0 to evaluate diversion of urban runoff to a publicly owned treatment works (POTW). Stormwater runoff collected at the Pulgas Creek Pump Station (PCPS) during WY 2013 and WY 2014 rainfall events was diverted to a regional domestic wastewater treatment plant that is located in Redwood City and operated by Silicon Valley Clean Water (SVCW). The PCPS drains catchments with primarily old industrial land uses with the most elevated concentrations of PCBs in MS4 sediment and stormwater runoff samples collected to-date in San Mateo County. The study included monitoring PCBs and mercury concentrations in the diverted stormwater runoff. In addition, an engineering firm was retained to provide conceptual designs and associated planning-level costs for two full-scale design options (gravity or pumped flow) for diversions from the PCPS to the SVCW treatment plant. The pumped flow design included repurposing an existing sanitary sewer booster pump station located adjacent to the PCSC.

Both designs accounted for capacity limitations in the local sanitary sewer collection system during wet weather conditions. The City of San Carlos' sanitary sewer system is susceptible to overflows during storm events due to infiltration and inflow (I/I) of groundwater and stormwater into the collection system. The City entered a Consent Decree with San Francisco Baykeeper in 2010 which requires implementation of measures to reduce sanitary sewer overflows (SSOs), which led to development of a January 2013 Sewer Collection System Master Plan. For this study, a hydraulic model developed during the master planning process was used to analyze the capacity of the collection system for conveying flows from the PCPS to the SVCW treatment plant during rainfall events. Not surprisingly, the model indicated that the collection system had limited capacity to accept additional flows during wet weather conditions without causing system overflows or surcharge.

Based upon the study monitoring and conceptual designs, the estimated pollutant loads that could be diverted from reaching the Bay by a full-scale pumped or gravity flow diversion from the PCPS to the SVCW treatment plant were relatively low (2 to 5 grams/year of PCBs and < 1 gram/year of mercury). Planning-level estimated costs ranged from \$11,000 to \$23,000 per gram of PCBs diverted to the treatment plant. Given the relatively low effectiveness in terms of pollutant load reduction and the relatively high costs, a full-scale diversion at the PCPS did not appear cost-effective compared to other PCBs controls and was not pursued further (SMCWPPP 2015b).

3.7. Addressing Illegal Dumping

This source control measure category entails addressing illegal dumping of waste (e.g., construction and demolition debris, stockpiles, spilled materials) containing PCBs or mercury to prevent it from entering MS4s. If enhancements are made by San Mateo County MRP Permittees to programs that address illegal dumping and would prevent PCBs or mercury removal from entering stormwater runoff, the associated pollutant load reductions will be documented.

3.8. Mercury Reduction via Hazardous Waste Collection Programs

Many types of devices and equipment (e.g., thermometers, switches, and fluorescent lamps) can contain mercury. When these devices are not adequately managed at their end-of-life, mercury can be released into the environment and become available to stormwater runoff. Control measures currently implemented by Permittees that address the potential for mercury releases include: 1) the support of policies and laws that reduce the mass of mercury in specific devices/equipment; and 2) the implementation of recycling programs that reduce the risk of mercury from being released at the end-of-life of these devices and equipment.

San Mateo County municipalities participate in San Mateo County Health Department's Household Hazardous Waste (HHW) Program and Very Small Quantity Generator Business Collection (VSQG) Program. The HHW Program offers residents the opportunity to drop-off mercury-containing devices and equipment and other hazardous wastes at designated drop-off points or drop-off events free of charge. The VSQG Program provides an inexpensive hazardous waste disposal option to eligible businesses, non-profits, and other government agencies that generate less than 100 kilograms of waste per month. It operates by appointment only and charges a fee to cover the cost of transportation and disposal. Many San Mateo County municipal agencies promote the availability of the HHW Program and VSQG Program on their agency websites. The estimated mass of mercury collected in FY 2021/22 via these programs is presented in Section 5.0.

4.0 EXISTING AND PLANNED CONTROL MEASURES

SMCWPPP is tracking all existing and planned control measures that should result in pollutant load reduction credits towards meeting the San Mateo County portion of the PCBs and mercury TMDL wasteload allocations and MRP 2.0 load reduction requirements. All existing controls that commenced or were enhanced in 2005 or later are assumed to reduce urban runoff pollutant loads relative to the PCBs TMDL baseline urban runoff load. This year was selected because load reductions due to controls fully implemented before 2005 were already accounted for in the PCBs TMDL baseline urban runoff load estimate. As part of the evaluation SMCWPPP is assessing whether each existing or planned control would represent a new action or an enhancement during the MRP 2.0 permit term, including a period immediately preceding the permit term.⁵ In addition to credit towards TMDL goals, such controls should result in credit towards the MRP 2.0 requirement that a 3,000 grams/year PCBs load reduction is achieved across the MRP 2.0 area by the end of the permit term. Of this, an interim 500 grams/year reduction was required by June 2018. These load reductions have been achieved (see SMCWPPP's FY 2019/20 Annual Report for more details). In addition, MRP 2.0 requires that at least 15 grams/year PCBs load reduction in San Mateo County is achieved via GI by the end of the permit term. The permit also requires a 6 grams/year mercury load reduction in San Mateo County via GI by the end of the permit term. The GI load reductions have also been achieved.

The WMAs identified in San Mateo County and the associated control measures currently implemented (i.e., existing) or the control measures under development (i.e., planned) within these WMAs to-date are described for each San Mateo County Permittee in Sections 4.1 through 4.19. Each WMA and the known GI/LID facilities within it constructed to-date are mapped in Appendix A, Figures A-1 through A-19. The Cities of Half Moon Bay and Pacifica drain to the Pacific Ocean and therefore were not included below, since this plan is focused on the PCBs and mercury TMDLs for San Francisco Bay. The inventory is organized alphabetically by Permittee and includes information on control measures in each WMA compiled by SMCWPPP to-date. It is important to note that the below summaries may not include all existing or planned control measures. The inventory will continue to be updated and refined as additional information becomes available. The land uses referenced in this report, including in Sections 4.1 through 4.19 below, are described in Appendix B.

⁵Based on language in the MRP and discussions with Regional Water Board staff, it is assumed that applicable controls implemented from July 1, 2013 through the end of the permit term should result in credit towards these load reduction requirements.

4.1. Town of Atherton

Watershed Management Areas

Table 4.1 lists the five WMA’s identified to-date in the Town of Atherton, and its total land area and associated land uses.

Table 4.1. Atherton WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
238	San Francisco Bay	8	0%	0%	100%	0%	0%	0%
252	Atherton Creek	10	0%	2%	98%	0%	0%	0%
261	Redwood Creek	882	0%	1%	99%	0%	0%	0%
71	Ravenswood Slough	10	0%	17%	83%	0%	0%	0%
ATH	Multiple	2,314	0%	9%	87%	0%	4%	0%

Existing and Planned Control Measures Summary

Table 4.2 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the Town of Atherton.

Table 4.2. Existing (E) and planned (P) PCBs and mercury control measures in Atherton WMAs

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
238	E			E		E	E			E
252				E		E	E			E
261				E		E	E			E
71	E			E		E	E			E
ATH		E/P		E		E	E			E

Source Property Investigation

Source property investigative work has been conducted in the Town of Atherton to-date in WMAs 71 and 238. Updated results will be provided in the SMCWPPP’s UCMR due in March 2023.

Green Infrastructure

Based on the information compiled to-date, GI at new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in Atherton treat **26 acres** of land comprised of old urban land use. Of this total, **12.6 acres** were built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021-22) (Table 4.3). An additional **16 acres** will be treated by new or redevelopment projects that are currently under construction or planned for construction. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

Table 4.3 Land area in the Atherton WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Parcel-Based New & Redevelopment or Retrofit	ATH	12.6		12.6	0.0		
	<i>Subtotal</i>	12.6	0.0	12.6	0.0	0.0	0.0
Total All GI		12.6	0.0	12.6	0.0	0.0	0.0

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Other PCBs and Mercury Controls

The Town of Atherton conducted a one-time desilting of the Atherton Channel at Watkins Avenue and Station Lane in 2004/2005. Approximately 25 cubic yards of sediment was removed during this activity. However, the sediment was not tested for PCBs and mercury. If the Town were to repeat this enhanced municipal O&M activity in the future it may be possible to test the sediment removed for PCBs and mercury and estimate the pollutant loads avoided.

SMCWPPP is also continuing to evaluate whether other relevant PCBs and mercury control measures are present in Atherton or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.2. City of Belmont

Watershed Management Areas

Table 4.4 lists the six WMAs identified to-date in the City of Belmont, and their total land areas and associated land uses.

Table 4.4. Belmont WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
101	Laurel Creek	10	1%	3%	96%	0%	0%	0%
1011	Steinberger Slough	60	21%	49%	9%	11%	10%	0%
32	Steinberger Slough	27	0%	33%	66%	0%	1%	0%
60	Laurel Creek	270	5%	29%	60%	5%	1%	0%
77	Belmont Creek	59	16%	23%	52%	9%	0%	0%
BEL	Multiple	2,505	0%	12%	62%	2%	24%	0%

Existing and Planned Control Measures Summary

Table 4.5 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the City of Belmont.

Table 4.5. Existing (E) and planned (P) PCBs and mercury control measures in Belmont WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems (Large and Small)	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
101	E		E	E		E	E			E
1011	E	E/P	E	E		E	E			E
32	E		E	E		E	E			E
60	E	E/P	E	E		E	E			E
77		E/P	E	E		E	E			E
BEL		E/P	E	E		E	E			E

Source Property Investigation

Source property investigative work has been conducted in the City of Belmont to-date in WMAs 101, 1011, 32, and 60. Updated results will be provided in the SMCWPPP’s UCMR due in March 2023.

Green Infrastructure

Based on the information compiled to-date, GI at new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in Belmont treat **32 acres** of land, of which **2.5 acres** are comprised of old industrial land use and another **20 acres** are comprised of old urban land use. Of this total, **19.3 acres** were built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.6). An additional **30 acres** will be treated by new or redevelopment projects that are currently under construction or planned for construction.

Belmont is also planning to construct green streets and regional stormwater capture projects on public lands or ROWs that will treat up to **28 acres** of land. Green streets are currently planned on Ralston Avenue. Belmont is also working with project partners to plan the regional stormwater runoff capture and creek restoration project at Twin Pines Park. This project has received \$900K in funding from C/CAG for design and 1 million in funding from DWR for creek restoration. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

Table 4.6 Land area in the Belmont WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Parcel-Based New & Redevelopment or Retrofit	60	2.7		2.1	0.2		0.4
	77	1.0	1.0	0.0			
	1011	3.4	0.0	0.0		0.0	3.4
	BEL	12.1	1.5	9.7	1.0		
	Subtotal	19.3	2.5	11.8	1.2	0.0	3.8
Total All GI		19.3	2.5	11.8	1.2	0.0	3.8

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Municipal Operation and Maintenance Practices

Enhanced Maintenance for Storm Drain Inlets with Small Trash Full Capture Devices

In recent years, the City of Belmont has installed a number of small full trash capture devices in public storm drain inlets. These devices treat over **590 acres** distributed across nine WMAs, including **33 acres** of old industrial and **540 acres** of old urban land uses (Table 4.7). Because of additional maintenance requirements for these devices, the city must clean these devices more frequently (i.e., two or more times per year) resulting in enhanced removal of trash and sediment-bound pollutants such as PCBs, mercury.

Table 4.7. Extent of land area in City of Belmont WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}

WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
		Old Industrial	Old Urban - Commercial/ Transportation	Old Urban - Residential/ Parks	New Urban	Ag/Open
60	102.39	12.77	38.92	50.18		0.52
77	17.93	4.22	6.05	7.65	0.01	0.00
1011	20.56	8.62	4.45	0.75	3.93	2.82
BEL	365.78	7.14	71.40	282.95		4.30
SCS	10.86			10.86		
SMO	3.73			3.73		
60B	41.30	0.77	15.04	25.48		
32	24.61		6.18	18.19		0.24
101	2.89		0.13	2.76		
TOTAL	590.06	33.52	142.17	402.56	3.93	7.88

1 – Acres presented may not include all acres currently treated by small inlet-based trash full capture devices.

2 – Includes only inlet-based trash full capture devices that are publicly owned and were installed by the City of Belmont between January 2010 and June 2022.

Other PCBs and Mercury Controls

SMCWPPP is continuing to evaluate whether other relevant PCBs and mercury control measures (e.g., enhanced municipal O&M) are present in Belmont or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.3. City of Brisbane

Watershed Management Areas

Table 4.8 lists the four WMAs identified to-date in the City of Brisbane, and their total land areas and associated land uses.

Table 4.8. Brisbane WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
1004	San Francisco Bay	721	72%	5%	2%	0%	21%	0%
17	Guadalupe Valley Creek	788	25%	11%	30%	0%	34%	0%
350	San Francisco Bay	8	14%	0%	2%	0%	84%	0%
BRI	Multiple	215	1%	10%	7%	25%	57%	0%

Existing and Planned Control Measures Summary

Table 4.9 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the City of Brisbane.

Table 4.9. Existing (E) and planned (P) PCBs and mercury control measures in Brisbane WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems (Large and Small)	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
1004	E	E/P	E	E		E	E			E
17	E	E/P	E	E		E	E			E
350	E			E		E	E			E
BRI			E	E		E	E			E

Source Property Investigation

Source property investigative work has been conducted in the City of Brisbane to-date in WMAs 17, 350, and 1004. Updated results will be provided in the SMCWPPP’s UCMR due in March 2023.

Green Infrastructure

Based on the information compiled to-date, GI at green streets and new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in Brisbane treat **34 acres** of land which is comprised almost entirely of old industrial land use. All of this GI was built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.10). An additional **146 acres** will be treated by new or redevelopment projects that are currently under construction or planned for construction. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

Brisbane was also awarded funding from C/CAG in December 2017 for a Safe Routes to School / Green Streets Infrastructure Pilot Project funded by local Safe Routes to School (SRTS) and stormwater funding, all from vehicle registration fees imposed by C/CAG on registered vehicles in San Mateo County. In 2020, the City completed a number of green infrastructure bio-retention basins along three SRTS walk routes in the city that treat approximately **0.81 acres** of public ROW.

Table 4.10 Land area in the Brisbane WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Green Street or Regional Retrofit	17	0.81			0.81		
	Subtotal	0.81			0.81		
Parcel-Based New & Redevelopment or Retrofit	17	21.0	21.0	0.07			
	1004	11.4	11.4	0.04			
	Subtotal	32.87	37.07	0.11	0.0	0.0	0.0
Total All GI		33.68	38.4	0.11	0.81	0.0	0.0

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Municipal Operation and Maintenance Practices

Enhanced Maintenance for Storm Drain Inlets with Small Trash Full Capture Devices

In recent years, the City of Brisbane has installed a number of small full trash capture devices in public storm drain inlets. These devices treat nearly 550 acres distributed across six WMAs, including 159 acres

of old industrial and 160 acres of old urban land uses (Table 4.11). Because of additional maintenance requirements for these devices, the city must clean these devices more frequently (i.e., two or more times per year) resulting in enhanced removal of trash and sediment-bound pollutants such as PCBs and mercury.

Table 4.11. Extent of land area in City of Brisbane WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}

WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
		Old Industrial	Old Urban - Commercial/ Transportation	Old Urban - Residential/ Parks	New Urban	Ag/Open
17	316.34	129.07	62.09	52.48		72.70
1004	48.30	6.10	5.82	11.58		24.79
SMC	3.64					3.64
SSF	0.00				0.00	
1004B	52.70	22.71	11.88			18.11
BRI	128.62	1.13	3.34	14.57	31.20	78.38
TOTAL	549.60	159.02	83.13	78.63	31.20	197.62

1 – Acres presented may not include all acres currently treated by small inlet-based trash full capture devices.

2 – Includes only inlet-based trash full capture devices that are publicly owned and were installed by the City of Brisbane between January 2010 and June 2022.

Other PCBs and Mercury Controls

Brisbane may cleanout sediment in mixing basins that are downstream of an area where elevated PCBs in storm drain sediments have been observed. If the City were to conduct this enhanced municipal O&M activity it may be possible to test the sediment removed for PCBs and mercury and estimate the pollutant loads avoided.

SMCWPPP is also continuing to evaluate whether other relevant PCBs and mercury control measures are present in Brisbane or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.4. City of Burlingame

Watershed Management Areas

Table 4.12 lists the 11 WMAs identified to-date in the City of Burlingame, and their total land areas and associated land uses.

Table 4.12. Burlingame WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
1005	San Francisco Bay	18	30%	65%	3%	0%	2%	0%
1006	San Francisco Bay	290	26%	41%	17%	11%	5%	0%
138	San Francisco Bay	15	69%	11%	0%	0%	20%	0%
139	Sanchez Creek	63	8%	2%	90%	0%	0%	0%
141	Easton Creek	62	31%	15%	54%	0%	0%	0%
142	Easton Creek	20	71%	29%	0%	0%	0%	0%
149	San Francisco Bay	81	10%	11%	79%	0%	0%	0%
16	San Francisco Bay	24	31%	0%	0%	0%	69%	0%
164	El Portal Creek	241	49%	22%	28%	0%	0%	0%
85	El Portal Creek	121	48%	51%	0%	0%	0%	0%
BUR	Multiple	1,845	1%	19%	75%	1%	4%	0%

Existing and Planned Control Measures Summary

Table 4.13 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the City of Burlingame.

Table 4.13. Existing (E) and planned (P) PCBs and mercury control measures in Burlingame WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems (Large and Small)	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
1005	E		E	E		E	E			E
1006	E	E/P	E	E		E	E			E
138				E		E	E			E
139		E/P	E	E		E	E			E
141	E	E	E	E		E	E			E
142	E	E	E	E		E	E			E
149	E	P	E	E		E	E			E
16	E	E		E		E	E			E
164	E	E/P	E	E		E	E			E
85	E	P	E	E		E	E			E
BUR	E	E/P	E	E		E	E			E

Source Property Investigation

Source property investigative work has been conducted in the City of Burlingame to-date in the nine WMAs indicated by Table 4.13. Updated results will be provided in the SMCWPPP’s UCMR due in March 2023.

Green Infrastructure

Based on the information compiled to-date, GI at green streets and new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in Burlingame treat **72 acres** of land which is comprised of **13 acres** of old industrial and **41 acres** of old urban land uses. Of this, **38 acres** were built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.14). An additional **98 acres** will be treated by new or redevelopment projects that are currently under construction or planned for construction.

Burlingame has seven existing green infrastructure projects on public lands and ROWs that treat nearly 4 acres. There are two public projects that are currently under construction. Specifically, the Burlingame Community Center (phase 2) and Village at Burlingame, which includes a new parking structure and housing structure. Additional information will be documented when it becomes available. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

Table 4.14 Land area in Burlingame WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Green Street or Regional Retrofit	139	0.0	0.0	0.0	0.0		
	164	0.8		0.8	0.0		0.0
	BUR	1.5		1.3	0.2		
	Subtotal	2.4	0.0	2.2	0.2	0.0	0.0
Parcel-Based New & Redevelopment or Retrofit	16	18.1					18.1
	139	5.4	5.4				
	164	4.7	2.8	1.9			
	1006	2.8		2.8			
	BUR	5.1		3.6	1.4		
	Subtotal	36.1	8.2	8.3	1.4	0.0	18.1
Total All GI		38.5	8.2	10.5	1.6	0.0	18.1

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Municipal Operation and Maintenance Practices

Enhanced Maintenance for Storm Drain Inlets with Small Trash Full Capture Devices

In recent years, the City of Burlingame has installed a number of small full trash capture devices in public storm drain inlets. These devices treat **510 acres** distributed across 11 WMAs, including **218 acres** of old industrial and **434 acres** of old urban land uses (Table 4.15). Because of additional maintenance requirements for these devices, the city must clean these devices more frequently (i.e., two or more times per year) resulting in enhanced removal of trash and sediment-bound pollutants such as PCBs and mercury.

Table 4.15. Extent of land area in City of Burlingame WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}

WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
		Old Industrial	Old Urban - Commercial/ Transportation	Old Urban - Residential/ Parks	New Urban	Ag/Open
139	13.24	4.17	1.06	8.02		
141	21.33	15.05	6.01			0.27
142	13.66	10.43	3.23			
149	14.36	5.23	4.74	4.40		
164	96.35	83.09	12.16	1.10		
1005	5.46	0.16	5.30			0.00
1006	97.45	38.84	45.90	12.28		0.44
BUR	151.76	5.00	98.31	46.02		2.43
MIL	0.02		0.01	0.01		
85	93.90	53.87	39.63			0.40
1006A	2.30	1.96	0.34			
TOTAL	509.84	217.79	216.69	71.83		3.54

1 – Acres presented may not include all acres currently treated by small inlet-based trash full capture devices.

2 – Includes only inlet-based trash full capture devices that are publicly owned and were installed by the City of Burlingame between January 2010 and June 2022.

Other PCBs and Mercury Controls

SMCWPPP is continuing to evaluate whether other relevant PCBs and mercury control measures (e.g., enhanced municipal O&M) are present in Burlingame or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.5. Town of Colma

Watershed Management Areas

Table 4.16 lists the 3 WMAs identified to-date in the Town of Colma, and their total land areas and associated land uses.

Table 4.16. Colma WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
181	Colma Creek	21	1%	37%	1%	0%	60%	0%
329	Colma Creek	65	6%	91%	1%	0%	2%	0%
COL	Multiple	1,139	1%	12%	3%	0%	84%	0%

Existing and Planned Control Measures Summary

Table 4.17 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the Town of Colma.

Table 4.17. Existing (E) and planned (P) PCBs and mercury control measures in Colma WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
181			E	E		E	E			E
329		E	E	E		E	E			E
COL	E	E/P	E	E		E	E			E

Source Property Investigation

Source property investigative work has been conducted in the Town of Colma to-date in WMA COL (Table 4.17). Updated results will be provided in the SMCWPPP’s UCMR due in March 2023.

Green Infrastructure

Based on the information compiled to-date, GI at green streets and new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in Colma treat **42 acres** of land which includes **29 acres** of old urban land uses. Of this, **27 acres** were built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.18). An additional **11 acres** will be treated by new or redevelopment projects that are currently under construction or planned for construction. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

The Town was also awarded funding from C/CAG in December 2017 for a Safe Routes to School/Green Streets Infrastructure Pilot Project funded by local Safe Routes to School and stormwater funding, all from vehicle registration fees in San Mateo County. Colma has two existing green street projects on public lands or ROWs. The first was constructed on Hillside Blvd in 2015 and treats **0.9 acres** of old urban land use, and a second that was completed on Mission Road in 2020 and treats **1.5 acres** of old urban land use. Colma is currently planning to construct a second green street project on Mission Road.

Table 4.18 Land area in Colma WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Green Street or Regional Retrofit	COL	2.4		1.5			0.9
	Subtotal	2.4		1.5			0.9
Parcel-Based New & Redevelopment or Retrofit	329	3.1		3.1			
	COL	21.9		10.3	0.7		10.9
	Subtotal	24.9		13.3	0.7		10.9
Total All GI		27.3		14.8	0.7		11.9

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Municipal Operation and Maintenance Practices

Enhanced Maintenance for Storm Drain Inlets with Small Trash Full Capture Devices

In recent years, the Town of Colma has installed a number of small full trash capture devices in public storm drain inlets. These devices treat **108 acres** distributed across four WMAs, including **102 acres** of old urban land uses (Table 4.19). Because of additional maintenance requirements for these devices, the town must clean these devices more frequently (i.e., two or more times per year) resulting in enhanced removal of trash and sediment-bound pollutants such as PCBs and mercury.

Table 4.19. Extent of land area in Town of Colma WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}

WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
		Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
181	0.19		0.09			0.10
329	43.92		40.07			3.85
COL	63.93	0.00	62.14			1.78
DCY	0.37					0.37
TOTAL	108.40	0.00	102.30			6.10

1 – Acres presented may not include all acres currently treated by small inlet-based trash full capture devices.

2 – Includes only inlet-based trash full capture devices that are publicly owned and were installed by the Town of Colma between January 2010 and June 2022.

Other PCBs and Mercury Controls

SMCWPPP is continuing to evaluate whether other relevant PCBs and mercury control measures (e.g., enhanced municipal O&M) are present in Colma or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.6. City of Daly City

Watershed Management Areas

Table 4.20 lists the six WMAs identified to-date in the City of Daly City, and their total land areas and associated land uses.

Table 4.20. Daly City WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
1004	San Francisco Bay	50	5%	68%	24%	0%	3%	0%
181	Colma Creek	28	1%	91%	0%	0%	8%	0%
307	Colma Creek	161	3%	22%	69%	0%	6%	0%
329	Colma Creek	742	0%	46%	45%	0%	9%	0%
350	San Francisco Bay	269	5%	30%	41%	0%	24%	0%
DCY	Multiple	1,131	1%	20%	64%	0%	16%	0%

Existing and Planned Control Measures Summary

Table 4.21 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the City of Daly City.

Table 4.21 Existing (E) and planned (P) PCBs and mercury control measures in Daly City WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
1004	E	P		E		E	E			E
181		E		E		E	E			E
307			E	E		E	E			E
329		E/P	E	E		E	E			E
350	E	P		E		E	E			E
DCY		E/P	E	E		E	E			E

Source Property Investigation

Source property investigative work has been conducted in the City of Daly City to-date in WMAs 1004 and 350 (Table 4.21). Updated results will be provided in the SMCWPPP’s UCMR due in March 2023.

Green Infrastructure

Based on the information compiled to-date, GI at green streets and new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in Daly City treat **112 acres** of land, which is comprised of mostly old urban land use. All of this GI was built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.22). An additional **98 acres** will be treated by new or redevelopment projects that are currently under construction or planned for construction. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

Daly City was also awarded funding from C/CAG in December 2017 for a Safe Routes to School/Green Streets Infrastructure Pilot Project funded by local Safe Routes to School and stormwater funding, all from vehicle registration fees in San Mateo County. The City is currently planning the Mission Street Streetscape improvements which will include stormwater treatment facilities.

Table 4.22 Land area in the Daly City WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Green Street or Regional Retrofit	COL	0.6			0.6		
	Subtotal	0.6			0.6		
Parcel-Based New & Redevelopment or Retrofit	181	3.2		3.2			
	329	103.2		103.2	0.0		
	DCY	4.5	0.4	1.8	2.4	0.0	0.0
	Subtotal	111.0	0.4	108.2	2.4		
Total All GI		111.5	0.4	108.2	2.9	0.0	0.0

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Municipal Operation and Maintenance Practices

Enhanced Maintenance for Storm Drain Inlets with Small Trash Full Capture Devices

In recent years, the City of Daly City has installed a number of small full trash capture devices in public storm drain inlets. These devices treat **226 acres** distributed across four WMAs, including **1.6 acres** of old industrial and **194 acres** of old urban land uses (Table 4.23). Because of additional maintenance requirements for these devices, the city must clean these devices more frequently (i.e., two or more times per year) resulting in enhanced removal of trash and sediment-bound pollutants such as PCBs and mercury.

Table 4.23. Extent of land area in City of Daly City WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}

WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
		Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
307	4.87		3.29	1.03		0.55
329	90.20	0.25	35.85	28.24		25.85
DCY	130.20	1.29	23.47	100.69		4.75
SMC	1.18	0.05	1.01	0.12		
TOTAL	226.45	1.59	63.62	130.09		31.16

1 – Acres presented may not include all acres currently treated by small inlet-based trash full capture devices.

2 – Includes only inlet-based trash full capture devices that are publicly owned and were installed by the City of Daly City between January 2010 and June 2022.

Other PCBs and Mercury Controls

SMCWPPP is continuing to evaluate whether other relevant PCBs and mercury control measures (e.g., enhanced municipal O&M) are present in Daly City or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.7. City of East Palo Alto

Watershed Management Areas

Table 4.24 lists the eight WMAs identified to-date in the City of East Palo Alto, and their total land areas and associated land uses.

Table 4.24. East Palo Alto WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
1015	San Francisco Bay	63	97%	3%	0%	0%	0%	0%
66	Ravenswood Slough	5	0%	1%	99%	0%	0%	0%
67	San Francisco Bay	95	17%	8%	64%	0%	11%	0%
68	San Francisquito Creek	317	1%	24%	70%	0%	4%	0%
70	San Francisco Bay	443	4%	25%	67%	0%	3%	0%
71	Ravenswood Slough	183	1%	20%	79%	0%	0%	0%
72	San Francisco Bay	26	79%	12%	0%	0%	9%	0%
EPA	Multiple	265	2%	18%	63%	0%	17%	0%

Existing and Planned Control Measures Summary

Table 4.25 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the City of East Palo Alto.

Table 4.25. Existing (E) and planned (P) PCBs and mercury control measures in East Palo Alto WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems (Large and Small)	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
1015	E	E/P	E	E		E	E			E
66	E		E	E		E	E			E
67	E	E/P	E	E		E	E			E
68		E	E	E		E	E			E
70	E	E/P	E	E		E	E			E
71	E		E	E		E	E			E
72	E	E	E	E		E	E			E
EPA	E	E	E	E		E	E			E

Source Property Investigation

Source property investigative work has been conducted in the City of East Palo Alto to-date in the seven WMAs indicated by Table 4.25. Updated results will be provided in the SMCWPPP’s UCMR due in March 2023.

Green Infrastructure

Based on the information compiled to-date, GI at new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in East Palo Alto treat **38 acres** of land which includes **15 acres** of old industrial and **17 acres** of old urban land uses. Of this, **21 acres** was built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.26). An additional **6 acres** will be treated by new or redevelopment projects that are currently under construction or planned for construction. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

The City was also awarded funding from C/CAG in December 2017 for a Safe Routes to School/Green Streets Infrastructure Pilot Project funded by local Safe Routes to School and stormwater funding, all from vehicle registration fees in San Mateo County. The City is currently planning and/or constructing six green street projects on public lands and/or in public ROW that will treat **nearly 2 acres**. Additional information will be documented when it becomes available.

Table 4.26. Land area in East Palo Alto WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Parcel-Based New & Redevelopment or Retrofit	67	1.2	1.2				
	68	1.8			1.2		0.6
	70	10.2	3.9	0.9	1.5		3.9
	72	2.2	2.2				
	1015	2.7	2.7				
	EPA	2.6			0.6		2.0
	Subtotal	20.7	10.0	0.9	3.3		6.5
Total All GI		20.7	10.0	0.9	3.3		6.5

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Large Full Trash Capture Systems

The City of East Palo Alto has installed large full trash capture treatment systems (i.e., public gross solids removal devices). These devices treat **923 acres** of land, including **47 acres** of old industrial and **829 acres** of old urban land uses (Table 4.27). These systems are owned and operated by the City and are distributed over eight WMAs. In addition to the area currently treated by these systems, the City may also install additional large full trash capture systems to treat more land areas in the future. Installation of these devices will not only assist the City in achieving its trash load reduction goals, but will also provide additional load reduction benefits for PCBs and mercury.

Table 4.27. Extent of land area in City of East Palo Alto WMAs that is addressed by publicly owned large full trash capture systems [i.e., Gross Solids Removal Devices (GSRD)].^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
GSRD	67	5.11	2.23	0.43	1.44		1.02
	68	310.48	4.23	76.52	222.47		7.26
	70	480.89	18.90	116.24	331.45		14.30
	71	2.51		0.07	2.44		
	1015	3.93	3.30	0.61			0.02
	EPA	104.31	4.53	11.41	62.83		25.53
	MPK	2.40			2.37		0.03
	72	14.27	13.61	0.59	0.04		0.03
	Subtotal	923.91	46.81	205.87	623.04		48.19
TOTAL	923.91	46.81	205.87	623.04		48.19	

1 – Acres presented may not include all acres currently treated by trash full capture treatment systems.

2 – Trash systems only include gross solids removal devices (GSRDs) that are publicly owned. Inlet based full trash capture devices are described in the operation and maintenance practices section.

3 - Includes all existing full trash capture systems in the City of East Palo Alto that were installed between January 2010 and June 2022.

Other PCBs and Mercury Controls

The City of East Palo Alto has reported preliminary information about potential opportunities to conduct sediment removal activities from locations that may have elevated PCBs concentrations. A large volume of soil (~150,000 cubic yards) resulting from past remediation activities (e.g., on the Stanford Campus) and believed to contain PCBs was stockpiled on a private property at 391 Demeter Street in East Palo Alto. The owner had stockpiled soils there for decades and the site was under Regional Water Board order until 2008. The City was not responsible for removing this material but believes soils may have migrated into nearby wetlands. In general, the City is addressing this old industrial area as part of its Ravenswood Specific Plan Area. The site may be undergoing redevelopment and the soil stockpiles may have been removed with testing of the soils for PCBs and other pollutants. SMCWPPP is currently in the process of obtaining more information from East Palo Alto staff.

SMCWPPP is also continuing to evaluate whether other relevant PCBs and mercury control measures (e.g., enhanced municipal O&M, including channel desilting projects and cleanout of a stormwater pump station located at the east end of O’Connor Street and adjacent stormwater basin) are present in East Palo Alto or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.8. City of Foster City

Watershed Management Areas

Table 4.28 lists the two WMAs identified to-date in the City of Foster City, and their total land areas and associated land uses.

Table 4.28. Foster City WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
1010	San Francisco Bay	271	19%	19%	1%	49%	11%	0%
FCY	Multiple	2,061	0%	7%	54%	31%	9%	0%

Existing and Planned Control Measures Summary

Table 4.29 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the City of Foster City.

Table 4.29. Existing (E) and planned (P) PCBs and mercury control measures in Foster City WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
1010		E/P	E	E		E	E			E
FCY		E/P	E	E		E	E			E

Source Property Investigation

Source property investigative work has not been conducted in WMAs in the City of Foster City to-date.

Green Infrastructure

Based on the information compiled to-date, GI at new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in Foster City treat **72 acres** of land, which is comprised of **5 acres** of old industrial and **15 acres** of old urban land use. Of this total, **69 acres** were built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.30). An additional **29 acres** will be

treated by new or redevelopment projects that are currently under construction or planned for construction. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

Foster City is planning a green street project at Chess Drive and Foster City Boulevard that will feature a bioretention area that will treat **0.4 acres**. The project has completed the permitting process with Caltrans and is tentatively scheduled to be bid and constructed in 2023. Additional information will be documented when it becomes available.

Table 4.30 Land area in Foster City WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Parcel-Based New & Redevelopment or Retrofit	1010	49.8	5.4	2.0		42.4	0.0
	FCY	18.9		10.0		7.1	1.8
	<i>Subtotal</i>	68.7	5.4	12.0	0.0	49.4	1.8
Total All GI		68.7	5.4	12.0	0.0	49.4	1.8

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Large Full Trash Capture Systems

The City of Foster City has installed one large full trash capture treatment system (i.e., public hydrodynamic separator unit, HDS). This device treats nearly **25 acres** of land, including **6.8 acres** of old industrial and **18 acres** of old urban land uses (Table 4.31). The system is owned and operated by the City and the treatment area is distributed over two WMAs. In addition to the area currently treated by this system, the City may also install additional large full trash capture systems to treat more land areas in the future. Installation of these devices will not only assist the City in achieving its trash load reduction goals, but will also provide additional load reduction benefits for PCBs and mercury.

Table 4.31. Extent of land area in City of Foster City WMAs that is addressed by publicly owned large full trash capture systems [i.e., Hydrodynamic Separators (HDS)].^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/ Transportation	Old Urban - Residential/ Parks	New Urban	Ag/Open
HDS	1010	16.06	6.77	9.29			
	FCY	8.57		8.57			
	Subtotal	24.63	6.77	17.86			
TOTAL		24.63	6.77	17.86			

1 – Acres presented may not include all acres currently treated by trash full capture treatment systems.

2 – Trash systems only include hydrodynamic separator (HDS) units that are publicly owned. Inlet based full trash capture devices are described in the operation and maintenance practices section.

3 - Includes all existing full trash capture systems in the City of Foster City that were installed between January 2010 and June 2022.

Other PCBs and Mercury Controls

Foster City conducted dredging in its lagoon in 2005 and removed about 100,000 cubic yards of sediment. Prior to this dredging project, in 1996 ten surface sediment samples were collected from locations that were spatially distributed throughout the lagoon. The samples were analyzed for PCBs (as Aroclors) and total mercury. PCBs were not detected in any of the 10 samples (detection limit of 20 µg/kg for each Aroclor). Mercury was detected in only 3 of the ten samples, at a relatively moderate level (0.2 mg/kg in each sample). It should be noted that Foster City was built in the 1960s and land uses, which are primarily residential and commercial/retail, have generally not changed since that time. In general, these land uses are associated with relatively low levels of PCBs and mercury in stormwater runoff. Based on the above data and the City’s land use, it appears unlikely that enhancing efforts to periodically dredge the Foster City lagoon would be a cost-effective measure to reduce loads of PCBs and mercury to the Bay.

SMCWPPP is also continuing to evaluate whether other relevant PCBs and mercury control measures are present in Foster City or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.9. Town of Hillsborough

Watershed Management Areas

Table 4.32 lists the one WMA identified to-date in the Town of Hillsborough, and its total land area and associated land uses.

Table 4.32. Hillsborough WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
HIL	Multiple	3,974	0%	3%	81%	0%	15%	0%

Existing and Planned Control Measures Summary

Table 4.33 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the Town of Hillsborough.

Table 4.33. Existing (E) and planned (P) PCBs and mercury control measures in Hillsborough WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
HIL		E/P		E						E

Source Property Investigation

Source property investigative work has not been conducted in WMAs in the Town of Hillsborough to-date.

Green Infrastructure

Based on the information compiled to-date, GI at green streets and new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in Hillsborough treat **0.22 acres** of land, all of which is comprised of old urban land use. All of this GI was built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.34). An additional **6 acres** will be treated by new or redevelopment projects that are currently under construction or planned for construction. The Town constructed an infiltration trench at Crossroads Park that treats **0.1 acres** and was completed during this

past fiscal year. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

Table 4.34 Land area in Hillsborough WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Green Street or Regional Retrofit	HIL	0.1			0.1		
	<i>Subtotal</i>	<i>0.1</i>	<i>0.0</i>	<i>0.0</i>	<i>0.1</i>	<i>0.0</i>	<i>0.0</i>
Parcel-Based New & Redevelopment or Retrofit	HIL	0.12		0.1	0.0		
	<i>Subtotal</i>	<i>0.12</i>	<i>0.0</i>	<i>0.1</i>	<i>0.0</i>	<i>0.0</i>	<i>0.0</i>
Total All GI		0.22	0.0	0.12	0.10	0.0	0.0

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Other PCBs and Mercury Controls

SMCWPPP is continuing to evaluate whether other relevant PCBs and mercury control measures (e.g., enhanced municipal O&M) are present in Hillsborough or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.10. City of Menlo Park

Watershed Management Areas

Table 4.35 lists the 12 WMAs identified to-date in the City of Menlo Park, and their total land areas and associated land uses.

Table 4.35. Menlo Park WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
1012	Ravenswood Slough	50	84%	16%	0%	0%	0%	0%
1014	Atherton Creek	102	44%	53%	2%	0%	1%	0%
238	San Francisco Bay	337	39%	32%	28%	0%	1%	0%
239	Atherton Creek	19	84%	16%	0%	0%	0%	0%
247	San Francisquito Creek	118	0%	35%	64%	0%	1%	0%
252	Atherton Creek	98	8%	23%	68%	0%	1%	0%
332	Atherton Creek	9	94%	6%	0%	0%	0%	0%
378	San Francisquito Creek	138	3%	2%	94%	0%	0%	0%
66	Ravenswood Slough	59	54%	9%	0%	36%	1%	0%
70	San Francisco Bay	47	0%	15%	84%	0%	1%	0%
71	Ravenswood Slough	1,041	6%	26%	61%	5%	3%	0%
MPK	Multiple	2,290	1%	23%	56%	1%	18%	0%

Existing and Planned Control Measures Summary

Table 4.36 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the City of Menlo Park.

Source Property Investigation

Source property investigative work has been conducted in the City of Menlo Park to-date in the nine WMAs shown in Table 4.36. Updated results will be provided in the SMCWPPP's UCMR due in March 2022.

Table 4.36. Existing (E) and planned (P) PCBs and mercury control measures in Menlo Park WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
1012	E	E/P		E		E	E			E
1014	E	E		E		E	E			E
238	E	E/P		E		E	E			E
239	E	E		E		E	E			E
247		E/P		E		E	E			E
252		E/P	E	E		E	E			E
332	E			E		E	E			E
378			E	E		E	E			E
66	E	E/P		E		E	E			E
70	E	E		E		E	E			E
71	E	E	E	E		E	E			E
MPK	E	E/P	E	E		E	E			E

Green Infrastructure

Based on the information compiled to-date, GI at green streets and new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in Menlo Park treat **305 acres** of land, of which **147 acres** is comprised of old industrial and **88 acres** is comprised of old urban land use. Of this total, **193 acres** were built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.37). An additional **69 acres** will be treated by new or redevelopment projects that are currently under construction or planned for construction. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

The City currently has two green street projects that that treat **4.1 acres** of land. The City was also awarded funding from C/CAG in December 2017 for a Safe Routes to School/Green Streets Infrastructure Pilot Project funded by local Safe Routes to School and stormwater funding, all from vehicle registration fees in San Mateo County. The City is currently planning additional green street facilities that will treat up to 3 acres of public ROW areas.

Table 4.37 Land area in Menlo Park WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Green Street or Regional Retrofit	238	2.4	2.4				
	MPK	1.6		1.3	0.4		
	Subtotal	4.1	2.4	1.3	0.4	0.0	0.0
Parcel-Based New & Redevelopment or Retrofit	66	16.3	5.0			11.3	
	71	11.0	6.5	1.6	2.8		
	238	62.4	47.5	14.9			
	239	9.7	9.7				
	247	13.0		11.4	1.6		
	252	11.2	9.0	2.3			
	1012	47.4	47.2	0.1			
	1014	9.1	5.2	3.9			
	MPK	8.3		6.2		2.1	
	SMC	0.7		0.7			
Subtotal	189.0	130.1	41.1	4.4	13.4		
Total All GI		193.1	132.5	42.3	4.8	13.4	0.0

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Municipal Operation and Maintenance Practices

Enhanced Maintenance for Storm Drain Inlets with Small Trash Full Capture Devices

In recent years, the City of Menlo Park has installed a number of small full trash capture devices in public storm drain inlets. These devices treat **266 acres** distributed across five WMAs, including **8 acres** of old industrial and **258 acres** of old urban land uses (Table 4.38). Because of additional maintenance requirements for these devices, the city must clean these devices more frequently (i.e., two or more times per year) resulting in enhanced removal of trash and sediment-bound pollutants such as PCBs and mercury.

Table 4.38. Extent of land area in City of Menlo Park WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}

WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
		Old Industrial	Old Urban - Commercial/ Transportation	Old Urban - Residential/ Parks	New Urban	Ag/Open
71	66.08		6.20	59.73		0.14
252	21.65	2.45	11.42	7.41		0.38
MPK	165.20	5.45	74.46	85.29		
SMC	0.66		0.66			
378	12.77			12.74		0.03
TOTAL	266.36	7.90	92.74	165.17		0.55

1 – Acres presented may not include all acres currently treated by small inlet-based trash full capture devices.

2 – Includes only inlet-based trash full capture devices that are publicly owned and were installed by the City of Menlo Park between January 2010 and June 2022.

Other PCBs and Mercury Controls

Menlo Park removed sediment from a section of the Atherton Channel at Haven Avenue and Bayfront Expressway (Highway 84) in 2007, 2008, 2009, 2011, 2013 and 2015. Each of these years the City removed about 500 cubic yards of sediment, except that only vegetation was removed in 2015. Since 2015, this cleaning has been performed every year and the City anticipates continuing with this schedule. Although the sediment has not been tested for PCBs to-date, the ongoing cleanout schedule provides a potential opportunity for future testing and calculation of load avoidance.

The Facebook West Campus is a 22-acre property located at 312-314 Constitution Avenue in Menlo Park. This site was identified in Envirostor as a voluntary PCBs cleanup site overseen by DTSC. The property is a former Raychem Corporation Facility, which later became Raychem/Tyco. The property was purchased by Facebook in 2011. Initial remedial actions at the site completed in 2007 included the excavation and off-site disposal of 6,561 cubic yards of contaminated soil and installation of a multi-media cap. Further remediation was conducted between 2012 and July 2013 and included excavation and off-site disposal of 1,800 cubic yards of PCBs contaminated soil with > 50 mg/Kg PCBs, and excavation and off-site disposal of 10,600 cubic yards of soil with < 50 mg/Kg PCBs. PCBs concentrations in the soil were as high as 2,600 mg/Kg prior to cleanup. The remediated soil cleanup concentration of <0.74 mg/Kg was achieved except for 100 cubic yards of soil with PCBs > 50 mg/Kg and 500 cubic yards of soil with PCBs < 50 mg/Kg that were left buried in place at 27 - 37 feet below the ground surface. SMCWPPP is evaluating whether a PCBs load reduction credit could be estimated for this site as a self-abatement.

SMCWPPP is also continuing to evaluate whether other relevant PCBs and mercury control measures are present in Menlo Park or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.11. City of Millbrae

Watershed Management Areas

Table 4.39 lists the four WMAs identified to-date in the City of Millbrae, and their total land areas and associated land uses.

Table 4.39. Millbrae WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
1005	San Francisco Bay	241	14%	27%	33%	0%	25%	0%
395	Highline Creek	481	3%	15%	77%	0%	5%	0%
401	Highline Creek	52	13%	69%	16%	0%	2%	0%
MIL	Multiple	1,309	2%	14%	71%	0%	13%	0%

Existing and Planned Control Measures Summary

Table 4.40 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the City of Millbrae.

Table 4.40. Existing (E) and planned (P) PCBs and mercury control measures in Millbrae WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
1005	E	E	E	E		E	E			E
395		E/P	E	E		E	E			E
401			E	E		E	E			E
MIL		E	E	E		E	E			E

Source Property Investigation

Source property investigative work has been conducted in the City of Millbrae to-date in WMA 1005 (Table 4.40). Updated results will be provided in the SMCWPPP’s UCMR due in March 2023.

Green Infrastructure

Based on the information compiled to-date, GI at green streets and new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in Millbrae treat **16 acres** of land, which is comprised of old urban land use. Of this total, **1.3 acres** were built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.41). An additional **32 acres** will be treated by new or redevelopment projects that are currently under construction or planned for construction. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

The City was also awarded funding from C/CAG in December 2017 for a Safe Routes to School/Green Streets Infrastructure Pilot Project funded by local Safe Routes to School and stormwater funding, all from vehicle registration fees in San Mateo County. Millbrae currently has one green street project on Taylor Boulevard and Almenar Street that treats **0.5 acres** of land with bioretention facilities. The City is also planning an additional green street project at the intersection of Laurel Avenue and Richmond Avenue that will treat an additional **0.5 acres** of land.

Table 4.41 Land area in Millbrae WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Green Street or Regional Retrofit	238	0.5		0.0	0.5		
	<i>Subtotal</i>	0.5	0.0	0.0	0.5	0.0	0.0
Parcel-Based New & Redevelopment or Retrofit	1005	0.8		0.8			
	<i>Subtotal</i>	0.8	0.0	0.8	0.0	0.0	0.0
Total All GI		1.3	0.0	0.8	0.5	0.0	0.0

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Large Full Trash Capture Systems

The City of Millbrae has installed large full trash capture treatment systems (i.e., public gross solids removal devices). These devices treat **597 acres** of land, including **9 acres** of old industrial and **564 acres** of old urban land uses (Table 4.42). These systems are owned and operated by the City and are distributed over five WMAs. In addition to the area currently treated by these systems, the City may also install additional large full trash capture systems to treat more land areas in the future. Installation of these devices will not only assist the City in achieving its trash load reduction goals, but will also provide additional load reduction benefits for PCBs and mercury.

Table 4.42. Extent of land area in City of Millbrae WMAs that is addressed by publicly owned large full trash capture systems [i.e., Gross Solids Removal Devices (GSRD)].^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
GSRD	238	0.64		0.03	0.61		
	395	432.97	7.84	64.86	340.80		19.47
	1005	29.19	0.08	8.96	19.32		0.83
	MIL	115.05	1.27	33.01	78.13		2.64
	401	18.68	0.25	16.78	1.65		
	Subtotal	596.53	9.45	123.64	440.51		22.93
TOTAL		596.53	9.45	123.64	440.51		22.93

1 – Acres presented may not include all acres currently treated by trash full capture treatment systems.

2 – Trash systems only include Gross Solids Removal Devices (GSRDs) that are publicly owned. Inlet based full trash capture devices are described in the operation and maintenance practices section.

3 - Includes all existing full trash capture systems in the City of Millbrae that were installed between January 2010 and June 2022.

Municipal Operation and Maintenance Practices

Enhanced Maintenance for Storm Drain Inlets with Small Trash Full Capture Devices

In recent years, the City of Millbrae has installed a number of small full trash capture devices in public storm drain inlets. These devices treat **64 acres** distributed across five WMAs, including **9 acres** of old industrial and **53 acres** of old urban land uses (Table 4.43). Because of additional maintenance requirements for these devices, the city must clean these devices more frequently (i.e., two or more times per year) resulting in enhanced removal of trash and sediment-bound pollutants such as PCBs and mercury.

Table 4.43. Extent of land area in City of Millbrae WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}

WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
		Old Industrial	Old Urban - Commercial/ Transportation	Old Urban - Residential/ Parks	New Urban	Ag/Open
395	15.08	1.23	3.55	10.08		0.22
1005	19.46	7.96	11.06	0.00		0.43
BUR	0.01		0.00	0.01		
MIL	16.75	0.00	13.84	2.66		0.25
401	12.85	0.19	5.30	6.25		1.11
TOTAL	64.15	9.39	33.75	18.99		2.01

1 – Acres presented may not include all acres currently treated by small inlet-based trash full capture devices.

2 – Includes only inlet-based trash full capture devices that are publicly owned and were installed by the City of Millbrae between January 2010 and June 2022.

Other PCBs and Mercury Controls

SMCWPPP is continuing to evaluate whether other relevant PCBs and mercury control measures (e.g., enhanced municipal O&M) are present in Millbrae or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.12. Town of Portola Valley

Watershed Management Areas

Table 4.44 lists the one WMA identified to-date in the Town of Portola Valley, and its total land area and associated land uses.

Table 4.44. Portola Valley WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
PVY	Multiple	5,794	0%	2%	36%	3%	58%	0%

Existing and Planned Control Measures Summary

Table 4.45 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the Town of Portola Valley.

Table 4.45. Existing (E) and planned (P) PCBs and mercury control measures in Portola Valley WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
PVY		E		E		E	E			E

Source Property Investigation

Source property investigative work has not been conducted in WMAs in the Town of Portola Valley to-date.

Green Infrastructure

Based on the information compiled to-date, GI at new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in Portola Valley treat **13 acres** of land, all of which is comprised of old urban land use. All of this total was built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14

through FY 2021/22) (Table 4.46). It should be noted that the information on GI reported in this section is preliminary and may be revised in the future as additional information becomes available.

Table 4.46 Land area in Portola Valley WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Parcel-Based New & Redevelopment or Retrofit	PVY	13.3		1.7	11.6		
	<i>Subtotal</i>	13.3	0.0	1.7	11.6	0.0	0.0
Total All GI		13.3	0.0	1.7	11.6	0.0	0.0

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Other PCBs and Mercury Controls

SMCWPPP is continuing to evaluate whether other relevant PCBs and mercury control measures (e.g., enhanced municipal O&M) are present in Portola Valley or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.13. City of Redwood City

Watershed Management Areas

Table 4.47 lists the 26 WMAs identified to-date in the City of Redwood City, and their total land areas and associated land uses.

Table 4.47. Redwood City WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
1000	San Francisco Bay	143	75%	4%	0%	12%	9%	0%
1011	Steinberger Slough	153	6%	4%	0%	62%	28%	0%
1013	Atherton Creek	38	15%	33%	37%	0%	14%	0%
1014	Atherton Creek	69	1%	16%	83%	0%	0%	0%
1016	Pulgas Creek	6	0%	15%	0%	0%	85%	0%
239	Atherton Creek	17	62%	36%	2%	0%	0%	0%
253	Atherton Creek	193	2%	12%	85%	0%	1%	0%
254	Atherton Creek	37	26%	67%	0%	1%	6%	0%
261	Redwood Creek	432	2%	26%	70%	0%	2%	0%
266	Redwood Creek	91	9%	63%	25%	4%	0%	0%
267	Redwood Creek	74	37%	35%	4%	23%	2%	0%
269	San Francisco Bay	45	9%	0%	0%	74%	16%	0%
323	Redwood Creek	185	1%	41%	57%	0%	0%	0%
324	Redwood Creek	44	8%	42%	50%	0%	0%	0%
325	Redwood Creek	21	15%	29%	56%	0%	0%	0%
327	Redwood Creek	126	19%	52%	29%	0%	1%	0%
333	Redwood Creek	15	29%	18%	0%	53%	0%	0%
334	Redwood Creek	19	48%	3%	0%	39%	10%	0%
335	Redwood Creek	24	73%	23%	0%	0%	4%	0%
336	Redwood Creek	66	24%	66%	10%	0%	1%	0%
337	Redwood Creek	137	17%	31%	52%	0%	0%	0%
379	Atherton Creek	400	27%	43%	30%	0%	0%	0%
388	Redwood Creek	42	2%	48%	50%	0%	0%	0%
405	San Francisco Bay	22	100%	0%	0%	0%	0%	0%
407	San Francisco Bay	18	61%	11%	0%	19%	9%	0%
RCY	Multiple	4,595	1%	8%	55%	21%	15%	0%

Existing and Planned Control Measures Summary

Table 4.48 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the City of Redwood City.

Table 4.48. Existing (E) and planned (P) PCBs and mercury control measures in Redwood City WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
80				E		E	E			E
239	E	E		E		E	E			E
253	E	E/P	E	E		E	E			E
254	E	E		E		E	E			E
261		E/P	E	E		E	E			E
266	E	E/P	E	E		E	E			E
267	E		E	E		E	E			E
269				E		E	E			E
323	E		E	E		E	E			E
324	E	E/P	E	E		E	E			E
325		E	E	E		E	E			E
327	E	E/P	E	E		E	E			E
333	E			E		E	E			E
334				E		E	E			E
335				E		E	E			E
336		E/P	E	E		E	E			E
337	E	E	E	E		E	E			E
379	E	E/P	E	E		E	E			E
388	E	E/P	E	E		E	E			E
405				E		E	E			E
407	E		E	E		E	E			E
1000	E	E/P	E	E		E	E			E
1009	E	E	E	E		E	E			E
1011	E	E		E		E	E			E
1013				E		E	E			E
1014	E	E		E		E	E			E
1016	E			E		E	E			E
RCY	E	E/P	E	E		E	E			E
SMC	E	E/P		E		E	E			E
WDE	E	E		E		E	E			E

Source Property Investigation

Source property investigative work has been conducted in the City of Redwood City to-date in the 21 WMAs indicated by Table 4.48. Updated results will be provided in the SMCWPPP's UCMR due in March 2023.

Green Infrastructure

Based on the information compiled to-date, GI at green streets and new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in Redwood City treat **258 acres** of land, of which **37 acres** is comprised of old industrial and **136 acres** is comprised of old urban land use. Of this total, **141 acres** were built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.49). An additional **81 acres** will be treated by new or redevelopment projects that are currently under construction or planned for construction. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

Redwood City has completed nine existing GI projects on public lands and ROWs during MRP 2.0 totaling 12.0 acres. The City also has an additional six projects that are currently planned on public lands or ROWs that will treat 9.7 acres of land.

In addition to these green street projects, the City received 1.1 million in funding from C/CAG and the County via funds awarded from the EPA San Francisco Bay Water Quality Improvement Fund to the County for the design of underground storage systems at Red Morton Park that will manage runoff from approximately 1,650 acres. The City has received the 30% design and begun the CEQA process during FY 2021/22, and will work to complete the design in FY 2022/23.

Table 4.49 Land area in Redwood City WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Green Street or Regional Retrofit	253	2.7			2.7		
	261	1.0			1.0		
	266	0.5	0.1	0.3			
	325	2.4	2.4				
	327	0.3		0.3			
	Other - RCY	0.4	0.1	0.1	0.2		
	RCY	1.2		0.2	0.9		
	Subtotal	8.4	2.6	1.0	4.9		
Parcel-Based New & Redevelopment or Retrofit	239	0.7	0.7	0.0			
	253	0.5			0.5		
	254	3.9	3.9				
	261	7.5	0.5	4.8	1.9		0.3
	266	11.6	3.8	7.0		0.9	
	324	5.6	1.8	2.8	0.7		0.3
	327	6.6	0.9	4.3	1.0		0.4
	336	7.0		1.1	5.9		
	337	1.2		1.2			
	379	28.6	17.6	11.0	0.0		
	388	1.2	0.6	0.6			
	1000	1.7	1.7				
	1009	0.1		0.1			
	1011						
	1014	1.1	0.1	1.0			
	RCY	54.8	0.8	22.7	11.4	17.5	2.3
	SMC						
	WDE						
Subtotal	132.1	32.3	56.7	21.5	18.4	3.3	
Total All GI		140.6	34.8	57.7	26.3	18.4	3.3

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Municipal Operation and Maintenance Practices

Enhanced Maintenance for Storm Drain Inlets with Small Trash Full Capture Devices

In recent years, the City of Redwood City has installed a number of small full trash capture devices in public storm drain inlets. These devices treat **779 acres** distributed across 17 WMAs, including **124 acres** of old industrial and **647 acres** of old urban land uses (Table 4.50). Because of additional maintenance requirements for these devices, the city must clean these devices more frequently (i.e., two or more times per year) resulting in enhanced removal of trash and sediment-bound pollutants such as PCBs and mercury.

Table 4.50. Extent of land area in City of Redwood City WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}

WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
		Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
111	1.22	1.02	0.18			0.01
253	12.63	1.58	4.16	6.89		
261	66.55	1.47	23.39	40.56		1.13
266	43.38	4.75	19.52	18.33	0.79	
324	12.74	0.99	4.83	6.93		
327	82.00	15.46	41.67	24.52		0.35
336	49.51	13.86	32.38	2.84		0.44
337	38.03	8.38	15.96	13.69		
379	146.66	46.72	57.27	42.33		0.35
388	27.73	0.68	15.09	11.94		0.03
1000	9.50	9.50				
1009	0.17		0.17			
RCY	241.48	8.07	32.73	198.82		1.87
407	0.64	0.44			0.20	
325	11.40	1.22	2.68	7.50		
323	12.25	0.00	9.64	2.61		
267	22.83	9.85	8.17	2.70	2.08	0.04
TOTAL	778.75	124.01	267.82	379.65	3.06	4.22

1 – Acres presented may not include all acres currently treated by small inlet-based trash full capture devices.

2 – Includes only inlet-based trash full capture devices that are publicly owned and were installed by the City of Redwood City between January 2010 and June 2022.

Other PCBs and Mercury Controls

SMCWPPP has also begun to evaluate the load reduction opportunity available through potential future sediment removal actions at a small stormwater detention pond in Redwood City. Areas draining to the pond include a portion of San Carlos with old industrial land uses that are associated with elevated PCBs in street and storm drain sediments, including the Delta Star / Tiegel site, a PCBs source property (see Section 4.15). There are currently no sediment removal actions conducted at the pond.

The stormwater detention pond is located within the Redwood Shores Ecological Reserve (Figure 4.1), which is owned and managed by the California Department of Fish and Wildlife. However, the Redwood City Public Works Department operates a pump station at the pond, including providing daily management of water levels in the pond and pump station maintenance as needed. As water levels in the pond rise, the pumps are turned on and water from the pond is pumped through a discharge pipe at the south-eastern edge of the pond into the adjacent Steinberger slough at discharge point A (Figure 4.1). A second discharge pipe conveys gravity-fed flow from the north-eastern edge of the pond into the Steinberger Slough at discharge point B (Figure 4.1). Both discharge pipe outfalls typically remains below the water surface in the slough, except at low tide.

SMCWPPP previously conducted a site visit to the pond with representatives from Redwood City Public Works and the California Fish and Wildlife Department. Based on the observations made during the visit, SMCWPPP identified several potential tasks that could be implemented as initial steps that would help inform the costs and benefits of implementing enhanced sediment removal activities at the site.

The tasks under consideration include:

- Characterizing PCBs and mercury concentrations in accumulated pond sediments;
- Characterizing concentrations of PCBs and mercury in sediments that have accumulated in the adjacent slough near the pond's outfalls and upstream and downstream, to better understand whether polluted sediment are transported from the pond to the slough;
- Monitoring stormwater flows into and out of the pond for PCBs and mercury to estimate loads into the pond, and subsequently into the slough from the pond.
- Estimate annual stormwater loads of PCBs and/or mercury that flow to the pond from the adjacent old industrial source areas;
- Estimating pollutant loads avoided via one-time or periodic sediment removal actions (e.g., sediment dredging) and the costs of those actions;
- Estimate the mass of PCBs and mercury in annual stormwater flows that are deposited within the pond and could be removed through ongoing sediment-removal actions;

If such monitoring and evaluation indicates that sediment removal actions at the pond would be a cost-effective control for PCBs and mercury, SMCWPPP and/or the City would work with the appropriate agencies (e.g., California Department of Fish and Wildlife) to further identify logistical considerations (e.g., methods, permits, schedules).

SMCWPPP is also continuing to evaluate whether other relevant PCBs and mercury control measures are present in Redwood City or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.



Figure 4.1. Drainage catchment and storm drain lines for the Redwood Shores Ecological Reserve Stormwater Detention Basin in Redwood City (shown in blue). Point A is the pump station discharge pipe location. Point B is the gravity fed discharge pipe location. Both discharge pipes empty to the Steinberger Slough.

4.14. City of San Bruno

Watershed Management Areas

Table 4.51 lists the eight WMAs identified to-date in the City of San Bruno, and their total land areas and associated land uses.

Table 4.51. San Bruno WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
1005	San Francisco Bay	301	6%	22%	65%	0%	7%	0%
290	San Bruno Creek	1,773	2%	29%	54%	0%	15%	0%
291	Colma Creek	23	0%	100%	0%	0%	0%	0%
292	Colma Creek	155	23%	56%	21%	0%	0%	0%
296	Colma Creek	573	0%	9%	55%	0%	36%	0%
307	Colma Creek	25	0%	24%	76%	0%	0%	0%
362	San Bruno Creek	3	48%	52%	0%	0%	0%	0%
SBO	Multiple	659	0%	20%	57%	0%	23%	0%

Existing and Planned Control Measures Summary

Table 4.52 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the City of San Bruno.

Source Property Investigation

Source property investigative work has been conducted in the City of San Bruno to-date in the five WMAs indicated by Table 4.52. Updated results will be provided in the SMCWPPP’s UCMR due in March 2023.

Table 4.52. Existing (E) and planned (P) PCBs and mercury control measures in San Bruno WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
1005	E	E	E	E		E	E			E
290		E/P	E	E		E	E			E
291	E		E	E		E	E			E
292	E		E	E		E	E			E
296	E			E		E	E			E
307		E		E		E	E			E
362	E			E		E	E			E
SBO				E		E	E			E

Green Infrastructure

Based on the information compiled to-date, GI at new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in San Bruno treat **23 acres** of land, of which **5.5 acres** is comprised of old industrial and **17 acres** is comprised of old urban land use. Of this total, **13.2 acres** were built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.53). An additional **65 acres** will be treated by new or redevelopment projects that are currently under construction or planned for construction. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

San Bruno had identified the need for retention within the Crestmoor Canyon watershed to address storm drain system capacity deficiencies. Ultimately, C/CAG and the City collaborated to conceptualize an approximately 20-acre-foot regional underground stormwater capture facility on Caltrans property within the large vacant land area within the I-280/380 interchange. Similar to the Belmont project, C/CAG worked with the Natural Resources Agency to provide \$913,000 to San Bruno for preliminary design and environmental review for the project. In addition, the County of San Mateo received a U.S. EPA Water Quality Improvement Fund (WQIF) grant under which \$200K was provided to the San Bruno project for preliminary design, for a total of \$1.13M between the two funding sources. San Bruno participated in the joint Request for Proposals process with C/CAG, Redwood City, and the County of San Mateo and has contracted with a design consultant and executed a project oversight cooperative agreement with Caltrans. The City has currently progressed through the pre-design phase with geotechnical, utility surveys, and other preliminary design studies completed as part of the Caltrans Project Study Report-Project Development Support (PSR-PDS) document. The City has also coordinated on expectations for

future ownership of the project and operations and maintenance needs, should the project get built, to support entering into a new cooperative agreement for the Project Approval & Environmental Documentation (PA&ED) phase. Concurrently, the City is developing the Design Standards Decision Document to advance the environmental and engineering studies as part of this next phase. C/CAG has worked over the past year with its federal legislative advocate to secure a member-directed spending request through Congresswoman Jackie Speier’s office for an additional \$2.4M towards the project approval and environmental review phase of the project.

Table 4.53 Land area in San Bruno WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Green Street or Regional Retrofit	1005	0.03		.03			
	<i>Subtotal</i>	<i>.03</i>	<i>0</i>	<i>.03</i>	<i>0</i>	<i>0</i>	<i>0</i>
Parcel-Based New & Redevelopment or Retrofit	290	12.2	5.5	2.8	2.9		1.0
	1005	1.0		1.0			
	<i>Subtotal</i>	<i>13.2</i>	<i>5.5</i>	<i>3.8</i>	<i>2.9</i>	<i>0.0</i>	<i>1.0</i>
Total All GI		13.2	5.5	3.8	2.9	0.0	1.0

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Municipal Operation and Maintenance Practices

Enhanced Maintenance for Storm Drain Inlets with Small Trash Full Capture Devices

In recent years, the City of San Bruno has installed a number of small full trash capture devices in public storm drain inlets. These devices treat **322 acres** distributed across five WMAs, including **30 acres** of old industrial and **286 acres** of old urban land uses (Table 4.54). Because of additional maintenance requirements for these devices, the city must clean these devices more frequently (i.e., two or more times per year) resulting in enhanced removal of trash and sediment-bound pollutants such as PCBs and mercury.

Table 4.54. Extent of land area in City of San Bruno WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}

WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
		Old Industrial	Old Urban - Commercial/ Transportation	Old Urban - Residential/ Parks	New Urban	Ag/Open
290	71.84	2.64	33.00	35.19		1.00
291	0.40		0.40			
292	76.21	22.04	22.95	31.11		0.11
1005	173.70	5.74	20.42	143.03		4.51
MIL	0.06		0.01	0.05		
TOTAL	322.22	30.42	76.79	209.39		5.62

1 – Acres presented may not include all acres currently treated by small inlet-based trash full capture devices.

2 – Includes only inlet-based trash full capture devices that are publicly owned and were installed by the City of San Bruno between January 2010 and June 2022.

Other PCBs and Mercury Controls

SMCWPPP is continuing to evaluate whether other relevant PCBs and mercury control measures (e.g., enhanced municipal O&M) are present in San Bruno or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.15. City of San Carlos

Watershed Management Areas

Table 4.55 lists the 11 WMAs identified to-date in the City of San Carlos, and their total land areas and associated land uses.

Table 4.55. San Carlos WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
1011	Steinberger Slough	261	52%	24%	24%	0%	0%	0%
1016	Pulgas Creek	135	74%	26%	0%	0%	0%	0%
207	Steinberger Slough	82	11%	33%	54%	0%	2%	0%
210	Pulgas Creek	141	57%	43%	0%	0%	0%	0%
31	Pulgas Creek	99	69%	15%	16%	0%	0%	0%
32	Steinberger Slough	39	21%	37%	42%	0%	0%	0%
57	Pulgas Creek	63	7%	58%	34%	0%	2%	0%
59	Steinberger Slough	28	88%	12%	0%	0%	0%	0%
75	Steinberger Slough	65	86%	14%	0%	0%	0%	0%
80	Cordilleras Creek	20	8%	82%	10%	0%	0%	0%
SCS	Multiple	2,510	0%	5%	80%	0%	15%	0%

Existing and Planned Control Measures Summary

Table 4.56 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the City of San Carlos.

Source Property Investigation

Source property investigative work has been conducted in the City of San Carlos to-date in the eight WMAs indicated by Table 4.43. WMA 31 and WMA 210, referred to respectively as the Pulgas Creek pump station north and south drainages, have been a particular focus areas for source property investigation work over the past 15 years. These primarily old industrial catchments have the most elevated concentrations of PCBs in MS4 sediment and stormwater runoff samples collected to-date from WMAs in San Mateo County. Collectively they were designated as a “pilot watershed” for the grant funded Clean Watershed for a Clean Bay (CW4CB) project (CW4CB 2017a). Two potential source properties that have been identified in these WMAs to-date are: (1) 977 and 1007/1011 Bransten Road in WMA 31 and (2) 1411 Industrial Road in WMA 210. SMCWPPP and the City of San Carlos have referred the 977 and 1007/1011 Bransten Road Bransten Road property to the Regional Water Board, as described below. SMCWPPP and the City of San Carlos are working with the property owner on next steps at the 1411 Industrial Road property. The property owner is working with Regional Water Board staff and has retained a consultant to investigate potential sources of PCBs associated with the property.

Table 4.56. Existing (E) and planned (P) PCBs and mercury control measures in San Carlos WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
1011	E	E	E	E		E	E			E
1016	E	E/P	E	E		E	E			E
207		E	E	E		E	E			E
210	E		E	E		E	E			E
31	E	E/P	E	E		E	E			E
32	E	P	E	E		E	E			E
57		E/P	E	E		E	E			E
59	E	E	E	E		E	E			E
75	E	P	E	E		E	E			E
80			E	E		E	E			E
SCS	E	E/P	E	E		E	E			E

Based on the spatial distribution of PCBs in MS4 and street dirt sediments collected in WMA 31 and WMA 210, it appears that other source(s) remain unidentified in WMA 210. PCBs from unknown sources were previously found in inlets and manholes in the vicinity of Center, Washington and Varian Streets and Bayport Avenue in WMA 210. The PCBs in these samples could have originated from any of about 20 small industries on these streets. During WY 2017, seven additional samples were collected in this area. The results suggested that three properties could be PCBs sources. Two samples collected from the driveways of 1030 Washington Street, a construction business, had elevated PCBs (1.29 and 3.73 mg/kg). A sample from the driveway of 1029 Washington Street was also elevated with a concentration of 5.64 mg/kg. In addition, samples from the driveway of 1030 Varian Street, an unpaved lot used for storage, had an elevated PCBs concentration of 1.84 mg/kg. It should be noted that all of the buildings in this area appear to be of the type and age that may have PCBs in building materials. SMCWPPP is currently working with the City of San Carlos to determine next steps for these properties. Additional sediment sampling conducted during WY 2020 in the vicinity of these properties yielded generally similar results. In WY 2021, SMCWPPP collected eight additional sediment samples in the area where three of the above properties (1030 Washington Street, 1029 Washington Street, and 1030 Varian Street) are located, with additional focus on the 1030 Varian Street property. The three samples collected closest to 1030 Varian Street had relatively low PCBs concentrations (< 0.2 mg/kg), suggesting that this an unpaved lot may not currently be a source of PCBs, despite the elevated sample (1.84 mg/kg) collected from its driveway in 2017. It appears that equipment and

unidentified materials have been intermittently stored at this location, which possibly could have resulted in intermittent release of PCBs. Otherwise, accounting for the normal variability in this type of sampling, WY 2021 results were consistent with past results. SMCWPPP is currently working with the City of San Carlos to determine next steps for these properties.

Another source property identified through SMCWPPP's investigations is located at 270 Industrial Road / 495 Bragato Road in WMA 1011 in San Carlos. 270 Industrial Road is occupied by the Delta Star facility where transformers are manufactured, including transformers with PCBs historically (from 1961 to 1974). Adjacent to 270 Industrial Road is 495 Bragato Road (Tiegel Manufacturing), a roughly three-acre site that is largely unpaved. PCBs appear to have migrated to this property from the Delta Star property. In October 2018, SMCWPPP and the City of San Carlos worked together to submit two source property referrals (both in San Carlos) to the Regional Water Board:

- 270 Industrial Road / 495 Bragato Road, San Carlos (Delta Star / Tiegel)
- 977 and 1007/1011 Bransten Road, San Carlos

The total combined acreage of these properties is about 10 acres, resulting in an estimated about 20 g/year load reduction (see Section 5.1 for the calculation methods) when these properties are formally referred and the associated enhanced municipal O&M is implemented, per MRP requirements.

Green Infrastructure

Based on the information compiled to-date, GI at green streets and new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in San Carlos treat **76 acres** of land, of which **55 acres** is comprised of old industrial and **20 acres** is comprised of old urban land use. Of this total, **73 acres** were built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.57). An additional **17 acres** will be treated by new or redevelopment projects that are currently under construction or planned for construction. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

San Carlos also has five existing green street projects that treat nearly 9 acres of public ROW areas, including 3.6 acres of old industrial and 4 acres of old urban land uses.

The City is also planning additional green streets along San Carlos Ave. The City is also working with Arundel Elementary School to construct bioretention facilities in the school's parking lot.

Table 4.57 Land area in San Carlos WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Green Street or Regional Retrofit	31	1.15	0.0	1.05	0.1		
	57	4.29	3.6	0.17			0.5
	1011	1.77		0.11	1.7		
	Other - SCS	1.36			1.4		
	Subtotal	8.57	3.6	1.33	3.1		0.5
Parcel-Based New & Redevelopment or Retrofit	31	7.9	7.9				
	57	2.5		2.1	0.4		
	59	18.2	18.2				
	207	6.3	5.7	0.6			0.0
	1011	13.4	13.4		0.0		
	1016	4.7	4.7				
	SCS	11.6		2.7	8.8		0.2
	Subtotal	64.6	49.9	5.4	9.1	0.0	0.2
Total All GI		73.1	53.5	6.7	12.3	0.0	0.7

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Municipal Operation and Maintenance Practices

Enhanced Maintenance for Storm Drain Inlets with Small Trash Full Capture Devices

In recent years, the City of San Carlos has installed a number of small full trash capture devices in public storm drain inlets. These devices treat **465 acres** distributed across 12 WMAs, including **161 acres** of old industrial and **302 acres** of old urban land uses (Table 4.58). Because of additional maintenance requirements for these devices, the city must clean these devices more frequently (i.e., two or more times per year) resulting in enhanced removal of trash and sediment-bound pollutants such as PCBs and mercury.

Table 4.58. Extent of land area in City of San Carlos WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}

WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
		Old Industrial	Old Urban - Commercial/ Transportation	Old Urban - Residential/ Parks	New Urban	Ag/Open
31	71.54	41.10	14.20	15.92		0.31
57	57.52	0.85	35.80	19.98		0.89
59	6.08	3.10	2.98			
207	42.05	2.05	16.41	23.02		0.57
1011	5.22	2.68	2.54			0.00
1016	19.03	6.96	11.75	0.28		0.05
RCY	0.01		0.00	0.01		
SCS	64.67	2.14	29.36	33.15		0.02
80	15.48	0.49	12.95	2.04		
75	38.81	31.17	7.63			
32	21.12	5.77	13.18	2.17		
210	91.20	59.56	31.58	0.07		
1011D	31.14	5.34	4.82	20.98		
1011C	1.96	0.00	1.96			
TOTAL	465.83	161.21	185.15	117.63		1.84

1 – Acres presented may not include all acres currently treated by small inlet-based trash full capture devices.

2 – Includes only inlet-based trash full capture devices that are publicly owned and were installed by the City of San Carlos between January 2010 and June 2022.

Other PCBs and Mercury Controls

As part of the CW4CB project, in 2013 San Carlos conducted a street flushing pilot project to test the effectiveness of this type of control measure in reducing PCBs and mercury in stormwater runoff (CW4CB 2017b). Additional street flushing is not currently planned in San Carlos or other locations in San Mateo County.

SMCWPPP is continuing to evaluate whether other relevant PCBs and mercury control measures (e.g., enhanced municipal O&M) are present in San Carlos or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.16. City of San Mateo

Watershed Management Areas

Table 4.59 lists the 20 WMAs identified to-date in the City of San Mateo, and their total land areas and associated land uses.

Table 4.59. City of San Mateo WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
1007	San Mateo Creek	87	11%	31%	56%	0%	2%	0%
1008	16th Avenue Channel	111	5%	15%	79%	0%	1%	0%
1009	Multiple	175	33%	34%	33%	0%	0%	0%
101	Laurel Creek	211	5%	22%	73%	0%	0%	0%
1010	San Francisco Bay	2	0%	0%	0%	99%	1%	0%
1017	San Francisco Bay	18	82%	17%	0%	0%	1%	0%
111	San Mateo Creek	95	8%	57%	33%	0%	2%	0%
114	16th Avenue Channel	85	18%	24%	58%	0%	0%	0%
120	16th Avenue Channel	10	6%	14%	80%	0%	0%	0%
149	San Francisco Bay	399	5%	12%	82%	0%	1%	0%
156	16th Avenue Channel	40	17%	57%	25%	0%	1%	0%
25	Poplar Creek	219	6%	17%	77%	0%	0%	0%
399	San Mateo Creek	32	6%	9%	85%	0%	0%	0%
403	16th Avenue Channel	48	4%	13%	83%	0%	0%	0%
408	16th Avenue Channel	43	19%	51%	28%	0%	2%	0%
60	Laurel Creek	28	0%	13%	1%	85%	1%	0%
89	Borel Creek	98	15%	49%	35%	0%	1%	0%
90	Borel Creek	21	6%	10%	84%	0%	0%	0%
92	Borel Creek	136	3%	36%	61%	0%	0%	0%
SMO	Multiple	5,789	1%	21%	64%	4%	9%	0%

Existing and Planned Control Measures Summary

Table 4.60 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the City of San Mateo.

Table 4.60. Existing (E) and planned (P) PCBs and mercury control measures in City of San Mateo WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
25	E		E	E		E	E			E
60	E			E		E	E			E
89	E	E/P		E		E	E			E
90		E		E		E	E			E
92		E/P		E		E	E			E
101	E		E	E		E	E			E
111	E	E/P	E	E		E	E			E
114	E	P	E	E		E	E			E
120		E	E	E		E	E			E
149	E	E/P	E	E		E	E			E
156	E	E/P	E	E		E	E			E
399			E	E		E	E			E
403	E		E	E		E	E			E
408	E	P	E	E		E	E			E
1007	E	E/P	E	E		E	E			E
1008		E	E	E		E	E			E
1009	E	E/P	E	E		E	E			E
1010				E		E	E			E
1017				E		E	E			E
SMO	E	E/P	E	E		E	E			E

Source Property Investigation

Source property investigative work has been conducted in the City of San Mateo to-date in the 13 WMAs shown in Table 4.60. Updated results will be provided in the SMCWPPP’s UCMR due in March 2023.

Green Infrastructure

Based on the information compiled to-date, GI at green streets and new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in the City of San Mateo treat **177 acres** of land which is comprised of **26 acres** of old industrial and **145 acres** of old urban land uses. Of this, **162 acres** were built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.61). An additional **85 acres** will be treated by new or redevelopment projects and green streets that are currently under construction or planned for construction. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

The City of San Mateo has five existing green street projects that are described in more detail below.

1. Laurel Elementary School Safe Routes to School. The San Mateo-Foster City School District, the City of San Mateo, and SMCWPPP created a project that built upon the Safe Routes to School program. A semicircular rain garden and seating area captures a portion of rooftop runoff while interior and perimeter stormwater planters in the parking lot manages building and parking lot runoff. Two street intersections now feature stormwater curb extensions that shorten crossing distance while at the same time capturing, slowing, and cleaning runoff before it enters Laurel Creek. The project was completed in 2015.
2. Delaware Street Bike Lane and Streetscape Improvement Project. The project consists of improvements to the bike lane and streetscape on South Delaware Street between Sunnybrae Boulevard and Charles Lane. Bioretention facilities are incorporated into street, traffic signage and striping, lighting, landscape, and irrigation improvements. In addition, the project includes a bioretention bulb-out at East 16th Avenue and South Claremont Street. The project was completed in 2014.
3. Poplar Corridor Safety Improvement Project. The project included safety improvements along the Poplar Avenue Corridor as well as neighborhood enhancements along Humboldt Street between Peninsula Avenue and Poplar Avenue. The project includes bioretention bulb-outs at the intersection of Humboldt Street and College Avenue and a mid-block bioretention curb extension along Humboldt Avenue in front of the San Mateo Superior Court, Central Branch location. The project was completed in 2016.
4. North Central Pedestrian Improvements Project. The North Central Pedestrian Improvements Project is part of the City's Pedestrian Master Plan. The intersection improvements include curb bulb-outs with bioretention. The project was completed in 2017.
5. East 4th Avenue and Fremont Street GI Project. The City built a Green Street project at East 4th Avenue and South Fremont Street (with curb extension and bioretention) as part of the San Francisco Estuary Partnership / BASMAA Urban Greening Bay Area grant from EPA through its San Francisco Bay Water Quality Improvement Fund. This project installed bioretention bulb-outs on the northwest and southwest corners of the intersection of East 4th Avenue and South Fremont Street, and on the northeast and southeast corners of South Delaware Street at East 5th Avenue and East 9th Avenue. The project included replacing concrete sidewalk, curb and gutter, and ramps, installing planters with bioretention soil and underdrain pipes, and adjusting the adjacent storm drain catch basins. The project was completed in 2020.

Table 4.61 Land area in City of San Mateo WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Green Street or Regional Retrofit	111	1.1		0.4	0.7		
	156	2.1		0.7	1.4		0.1
	SMO	5.1		2.4	2.7		
	Subtotal	8.3		3.4	4.8		0.1
Parcel-Based New & Redevelopment or Retrofit	89						
	90	1.1	1.1				
	92	83.0	0.0	15.9	66.9		0.2
	111	0.3					0.3
	120						
	149	3.1	3.1				
	156	6.6		6.6			
	379	0.4	0.4				
	395	3.2		3.2			
	1007	0.3	0.3				
	1008	3.2	3.2		0.0		
	1009	15.9	15.3		0.6		
	RCY	0.5	0.5				
	SMO	36.1	0.4	27.2	4.4	4.0	0.0
Subtotal	153.6	24.3	52.9	71.9	4.0	0.5	
Total All GI		162.0	24.3	56.4	76.7	4.0	0.6

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

4 – The land use at the point location for each project provided by Permittees was assumed to represent the land use for the entire project.

Large Full Trash Capture Systems

The City of San Mateo has installed two large full trash capture treatment systems (i.e., two public Debris Separating Baffle Boxes, DSBBs). These devices treats **751 acres** of land, including **32 acres** of old industrial and **713 acres** of old urban land uses (Table 4.62). The systems are owned and operated by the City and the treatment areas are distributed over five WMAs, including portions within the City of Burlingame. In addition to the area currently treated by these systems, the City may also install additional large full trash capture systems to treat more land areas in the future. Installation of these devices will not only assist the City in achieving its trash load reduction goals, but will also provide additional load reduction benefits for PCBs and mercury.

Table 4.62. Extent of land area in City of San Mateo WMAs that is addressed by publicly owned large full trash capture systems [i.e., Debris Separating Baffle Boxes (DSBBs)].^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/ Transportation	Old Urban - Residential/ Parks	New Urban	Ag/Open
DSBB	25	186.96	13.13	29.58	144.24		
	149	285.77	14.70	28.78	236.39		5.90
	1007	8.58	0.39	2.43	5.76		
	SMO	94.89	3.10	26.15	65.64		
	BUR	175.32	0.85	11.46	163.01		
	Subtotal	751.52	32.17	98.40	615.05	0.00	5.90
TOTAL	751.52	32.17	98.40	615.05	0.00	5.90	

1 – Acres presented may not include all acres currently treated by trash full capture treatment systems.

2 – Trash systems only include Debris Separating Baffle Boxes (DSBBs) that are publicly owned. Inlet based full trash capture devices are described in the operation and maintenance practices section.

3 - Includes all existing full trash capture systems in the City of San Mateo that were installed between January 2010 and June 2022.

Municipal Operation and Maintenance Practices

Enhanced Maintenance for Storm Drain Inlets with Small Trash Full Capture Devices

In recent years, the City of San Mateo has installed a number of small full trash capture devices in public storm drain inlets. These devices treat **253 acres** distributed across 16 WMAs, including **21 acres** of old industrial and **230 acres** of old urban land uses (Table 4.63). Because of additional maintenance requirements for these devices, the city must clean these devices more frequently (i.e., two or more times per year) resulting in enhanced removal of trash and sediment-bound pollutants such as PCBs and mercury.

Table 4.63. Extent of land area in City of San Mateo WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}

WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
		Old Industrial	Old Urban - Commercial/ Transportation	Old Urban - Residential/ Parks	New Urban	Ag/Open
25	1.29	0.01	0.18	1.11		
101	2.51		2.51			
111	61.25	4.68	45.97	9.61		0.98
114	6.37	1.57	0.70	4.10		
120	7.50	0.58	0.71	6.21		
149	6.28	1.00	1.54	3.74		
156	1.65	0.29	1.29	0.00		0.07
399	19.84	1.64	1.73	16.42		0.04
403	40.36	1.26	1.74	37.36		
408	0.86		0.55			0.31
1007	9.55	2.49	3.59	3.48		
1008	42.89	5.12	2.22	35.54		
1009	5.02	2.18	2.38	0.47		
BUR	0.34		0.01	0.33		
RCY	0.51	0.51				
SMO	46.75		17.69	28.85		0.20
TOTAL	252.96	21.32	82.81	147.22		1.61

1 – Acres presented may not include all acres currently treated by small inlet-based trash full capture devices.

2 – Includes only inlet-based trash full capture devices that are publicly owned and were installed by the City of San Mateo between January 2010 and June 2022.

Other PCBs and Mercury Controls

SMCWPPP is continuing to evaluate whether other relevant PCBs and mercury control measures (e.g., enhanced municipal O&M) are present in the City of San Mateo or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.17. Unincorporated San Mateo County

Watershed Management Areas

Table 4.64 lists the 17 WMAs identified to-date in unincorporated County of San Mateo, and their total land areas and associated land uses.

Table 4.64. Unincorporated County of San Mateo WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
1005	San Francisco Bay	224	9%	33%	0%	0%	57%	0%
1011	Steinberger Slough	33	60%	38%	2%	0%	0%	0%
17	Guadalupe Valley Creek	850	1%	0%	0%	0%	99%	0%
181	Colma Creek	26	47%	44%	9%	0%	0%	0%
247	San Francisquito Creek	121	17%	70%	12%	0%	1%	0%
253	Atherton Creek	87	15%	4%	79%	0%	1%	0%
261	Redwood Creek	319	0%	13%	87%	0%	0%	0%
290	San Bruno Creek	224	0%	10%	0%	0%	90%	0%
293	Colma Creek	18	0%	0%	0%	0%	100%	0%
296	Colma Creek	131	0%	11%	37%	0%	52%	0%
307	Colma Creek	126	0%	0%	0%	0%	100%	0%
332	Atherton Creek	8	7%	6%	87%	0%	0%	0%
350	San Francisco Bay	40	0%	0%	0%	0%	100%	0%
379	Atherton Creek	403	28%	20%	50%	0%	1%	0%
71	Ravenswood Slough	158	0%	6%	94%	0%	0%	0%
77	Belmont Creek	27	81%	7%	11%	0%	0%	0%
SMC	Multiple	174,760	1%	1%	3%	0%	94%	0%

Existing and Planned Control Measures Summary

Table 4.65 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in unincorporated County of San Mateo.

Source Property Investigation

Source property investigative work has been conducted in unincorporated County of San Mateo to-date in the 14 WMAs indicated by Table 4.65. Updated results will be provided in the SMCWPPP's UCMR due in March 2023.

Table 4.65. Existing (E) and planned (P) PCBs and mercury control measures in unincorporated San Mateo County WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
1005				E		E	E			E
1011	E	P		E		E	E			E
17	E			E		E	E			E
149 ^{1,2}	n/a ⁵	E/P	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
181		E	E	E		E	E			E
247				E		E	E			E
253	E		E	E		E	E			E
261		E	E	E		E	E			E
266 ^{1,3}	n/a	P	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
290		E		E		E	E			E
293	E			E		E	E			E
296	E			E		E	E			E
307		E		E		E	E			E
327 ^{1,3}	n/a	P								
332	E			E		E	E			E
336 ^{1,3}	n/a	P	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
350	E			E		E	E			E
379	E	E/P	E	E		E	E			E
71	E	E		E		E	E			E
77		E		E		E	E			E
SMC	E	E/P	E	E		E	E			E
SMO ^{1,2}	n/a	E/P	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
SSF ^{1,4}	n/a	P	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

1 – Although the WMA is not under unincorporated County’s jurisdiction, the County owns one or more parcels in the WMA that have existing or planned GI projects. Other control measures in these WMAs are identified in the existing and planned control measure tables for each municipality that has jurisdiction over the WMA land area, as identified below.

2 – WMAs 149 and SMO are located in the City of San Mateo. See Section 4.1.6 for all control measures in these WMAs.

3 – WMAs 266, 327, and 336 are located in Redwood City. See Section 4.1.3 for all control measures in these WMAs.

4 – WMA SSF is located in South San Francisco. See Section 4.1.8 for all control measures in this WMA.

5 – n/a = not applicable, because the control measure is or would be implemented by another municipality.

Green Infrastructure

Based on the information compiled to-date, GI at green streets and new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in unincorporated County of San Mateo treat **205 acres** of land which includes **7.8 acres** of old industrial and **96 acres** of old urban land uses. Of this, **162 acres** were built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.66). An additional **29 acres** will be treated by green streets and new or redevelopment projects that are currently under construction or planned for construction. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

Unincorporated County of San Mateo continues to promote, plan and construct green street projects on public lands and ROWs. Existing green street projects treat nearly 8 acres of predominantly old urban land use. The County is also constructing or planning to construct additional green street projects as part of improvements planned for Encina Avenue and Middlefield Road.

Regional stormwater capture projects are designed to remove pollutants from stormwater through filtration or augment water supply through infiltration. The County is participating in efforts to develop concept designs for 5 regional stormwater capture projects. Additionally, the County conducted a green infrastructure (GI) feasibility analysis to identify locations to construct GI projects on planned street improvement projects. In total, the County evaluated 16 streets segments in North Fair Oaks and West Menlo, and 24 street improvements in unincorporated commercial/industrial areas for GI feasibility. Six priority locations were identified from this effort and will be considered for GI implementation.

Table 4.66 Land area in Unincorporated County of San Mateo WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Green Street or Regional Retrofit	379	1.5	0.0	1.4	0.0		0.0
	1007	2.1		0.1	1.9		0.1
	SMC	3.3		0.1	3.2		
	Subtotal	6.9	0.0	1.6	5.1		0.1
Parcel-Based New & Redevelopment or Retrofit	71	9.5		6.7	2.8		
	77	2.2	2.2				
	92	1.3			1.3		
	111	1.2	1.0	0.2			0.0
	149	6.1			6.1		
	181	1.0		1.0			
	261	1.0			1.0		
	290	2.0			2.0		
	307	2.3					2.3
	379	8.8	1.8	6.8	0.0		0.2
	SMC	119.5	0.0	13.5	23.0	0.0	82.9
	SMO	0.8		0.8			
	Subtotal	155.5	5.1	29.0	36.1	0.0	85.4
Total All GI		162.4	5.1	30.6	41.2	0.0	85.5

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Municipal Operation and Maintenance Practices

Enhanced Maintenance for Storm Drain Inlets with Small Trash Full Capture Devices

In recent years, the Unincorporated County has installed a number of small full trash capture devices in public storm drain inlets. These devices treat 381 acres distributed across 8 WMAs, including 64 acres of old industrial and 311 acres of old urban land uses (Table 4.67). Because of additional maintenance requirements for these devices, the county must clean these devices more frequently (i.e., two or more times per year) resulting in enhanced removal of trash and sediment-bound pollutants such as PCBs and mercury.

Table 4.67. Extent of land area in Unincorporated San Mateo County WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}

WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
		Old Industrial	Old Urban - Commercial/ Transportation	Old Urban - Residential/ Parks	New Urban	Ag/Open
181	0.44	0.01	0.32			0.11
253	6.62	2.71	0.35	3.53		0.03
261	4.97	0.12	4.46	0.39		
379	273.42	57.52	55.57	156.48		3.85
ATH	0.42		0.42			
COL	1.03		0.08	0.10		0.85
DCY	5.18	0.85	1.55	2.77		0.01
SMC	88.92	3.24	33.86	51.26		0.56
TOTAL	380.99	64.44	96.61	214.53		5.42

1 – Acres presented may not include all acres currently treated by small inlet-based trash full capture devices.

2 – Includes only inlet-based trash full capture devices that are publicly owned and were installed by Unincorporated San Mateo County between January 2010 and June 2022.

Other PCBs and Mercury Controls

SMCWPPP is continuing to evaluate whether other relevant PCBs and mercury control measures are present in unincorporated San Mateo County or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.18. City of South San Francisco

Watershed Management Areas

Table 4.68 lists the 30 WMAs identified to-date in the City of South San Francisco, and their total land areas and associated land uses.

Table 4.68. City of South San Francisco WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
1001	Colma Creek	410	42%	35%	17%	0%	6%	0%
1002	San Francisco Bay	293	62%	31%	0%	2%	5%	0%
1005	San Francisco Bay	7	0%	100%	0%	0%	0%	0%
1011	Steinberger Slough	40	41%	39%	0%	0%	21%	0%
291	Colma Creek	171	81%	18%	0%	0%	2%	0%
292	Colma Creek	65	95%	4%	0%	0%	2%	0%
293	Colma Creek	636	27%	22%	39%	0%	12%	0%
294	Colma Creek	67	92%	8%	0%	0%	0%	0%
295	Colma Creek	25	73%	22%	0%	0%	4%	0%
296	Colma Creek	568	4%	24%	70%	0%	2%	0%
297	Colma Creek	30	13%	18%	69%	0%	0%	0%
298	Colma Creek	122	9%	9%	72%	0%	10%	0%
306	Colma Creek	37	37%	23%	41%	0%	0%	0%
307	Colma Creek	943	1%	19%	74%	1%	5%	0%
311	Colma Creek	111	3%	11%	85%	0%	1%	0%
313	San Francisco Bay	77	42%	21%	34%	0%	4%	0%
314	San Francisco Bay	66	78%	16%	0%	0%	6%	0%
315	San Francisco Bay	108	84%	16%	0%	0%	0%	0%
316	San Francisco Bay	117	82%	18%	0%	0%	0%	0%
317	San Francisco Bay	32	89%	11%	0%	0%	0%	0%
318	San Francisco Bay	70	84%	16%	0%	0%	1%	0%
319	San Francisco Bay	99	75%	25%	0%	0%	0%	0%
352	Colma Creek	40	17%	2%	81%	0%	0%	0%
354	Colma Creek	10	85%	14%	0%	0%	0%	0%
356	Colma Creek	10	79%	20%	0%	0%	1%	0%
357	Colma Creek	17	65%	32%	0%	0%	3%	0%
358	Colma Creek	32	73%	27%	0%	0%	0%	0%
359	Colma Creek	23	92%	8%	0%	0%	0%	0%
362	San Bruno Creek	14	61%	39%	0%	0%	0%	0%
SSF	Multiple	1,539	13%	18%	56%	1%	12%	0%

Existing and Planned Control Measures Summary

Table 4.69 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the City of South San Francisco.

Table 4.69. Existing (E) and planned (P) PCBs and mercury control measures in South San Francisco WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
291	E	E/P		E		E	E			E
292	E	E	E	E		E	E			E
293	E	E/P	E	E		E	E			E
294	E		E	E		E	E			E
295	E		E	E		E	E			E
296	E	E/P	E	E		E	E			E
297			E	E		E	E			E
298		P	E	E		E	E			E
306	E	E/P	E	E		E	E			E
307		E/P	E	E		E	E			E
311				E		E	E			E
313	E	E/P	E	E		E	E			E
314	E	E	E	E		E	E			E
315	E	E/P	E	E		E	E			E
316	E	E/P	E	E		E	E			E
317	E			E		E	E			E
318	E	E/P	E	E		E	E			E
319	E	E/P	E	E		E	E			E
352			E	E		E	E			E
354	E			E		E	E			E
356	E			E		E	E			E
357	E			E		E	E			E
358	E	E	E	E		E	E			E
359	E	E	E	E		E	E			E
362	E	E		E		E	E			E
1001	E	E/P	E	E		E	E			E
1002	E	E/P	E	E		E	E			E
1005	E			E		E	E			E
1011	E			E		E	E			E
SSF	E	E/P	E	E		E	E			E

Source Property Investigation

Source property investigative work has been conducted in the City of South San Francisco to-date in the 25 WMAs indicated by Table 4.69. Updated results will be provided in the SMCWPPP's UCMR due in March 2023.

Green Infrastructure

Based on the information compiled to-date, GI at green street and new and redevelopment project sites built since 2005 (the PCBs TMDL loading baseline year) in the City of South San Francisco treat **392 acres** of land which includes **300 acres** of old industrial and **85 acres** of old urban land uses. Of this, **181 acres** were built from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) (Table 4.70). An additional **161 acres** will be treated by new or redevelopment projects that are currently under construction or planned for construction. It should be noted that the acres treated by GI reported in this section are preliminary and may be revised in the future as additional information becomes available.

The City has completed three green street projects that treat nearly **1 acre** of land. In addition, the Orange Memorial Park Stormwater Capture Project is a \$15.5M collaboration between the City of South San Francisco and the California Department of Transportation (CalTrans) which will provide water quality improvements and help keep San Francisco Bay healthy and clean. This regional stormwater capture project would potentially capture flows from approximately **2,487 acres** of a multi-jurisdictional area of primarily old urban land uses. The project will divert water from Colma Creek and filter the water through an underground water filtration system to reduce discharges of PCBs (Polychlorinated Biphenyls), trash, sediment, and mercury to the San Francisco Bay. The Project will capture runoff through the installation of an instream diversion and pre-treatment structure (trash screen and sediment removal chamber). Pretreated water will then enter a pipe leading to an underground cistern located under the sports field holding water for eventual non-potable irrigation use, which includes irrigation to the park and along portions of Centennial Trail. When full, the cistern overflows into an infiltration gallery which will provide groundwater recharge benefits. The project is scheduled to complete construction in Summer 2022 and should be fully operational during the next fiscal year.

Table 4.70 Land area in City of South San Francisco WMAs treated by GI built from July 1, 2013 to June 30, 2022.^{1,2,3}

Project Type	WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
			Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
Green Street or Regional Retrofit	293	0.0		0.0	0.0		
	307	0.2		0.2	0.0		
	SSF	0.6		0.2	0.4		0.0
	Subtotal	0.9	0.0	0.4	0.5	0.0	0.0
Parcel-Based New & Redevelopment or Retrofit	291	7.6	7.6				
	292	26.5	26.5				
	293	20.2	18.2	1.9	0.2		
	296	0.5		0.5			
	306	0.7		0.7			
	307	10.0		10.0			
	313	27.6	27.6				
	314	3.6		3.6			
	315	3.6	3.6				
	316	14.0	14.0	0.0			
	318	4.8	4.8	0.0			
	319	5.0	5.0				
	359	3.4	3.3	0.0			
	1001	15.1	9.3	5.7			0.1
	1002	33.0	32.0	1.0			
SSF	4.1		2.4	1.7			
Subtotal	179.8	152.0	25.8	1.9		0.1	
Total All GI		180.6	152.0	26.2	2.4	0.0	0.1

1 – Preliminary - may not include all acres currently treated by GI and treatment controls.

2 – GI includes (1) parcel-based new development, redevelopment, or retrofit projects; and (2) green street projects or regional retrofit projects.

3 – GI and treatment controls may include proprietary vault-based systems.

Municipal Operation and Maintenance Practices

Enhanced Maintenance for Storm Drain Inlets with Small Trash Full Capture Devices

In recent years, the City of South San Francisco has installed a number of small full trash capture devices in public storm drain inlets. These devices treat 1,330 acres distributed across 28 WMAs, including 487 acres of old industrial and 832 acres of old urban land uses (Table 4.71). Because of additional maintenance requirements for these devices, the city must clean these devices more frequently (i.e., two or more times per year) resulting in enhanced removal of trash and sediment-bound pollutants such as PCBs and mercury.

Table 4.71. Extent of land area in City of South San Francisco WMAs that is addressed by publicly owned small full trash capture devices (i.e., inlet-based full trash capture devices).^{1,2}

WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
		Old Industrial	Old Urban - Commercial/Transportation	Old Urban - Residential/Parks	New Urban	Ag/Open
291	97.82	79.64	17.76			0.42
292	10.39	8.86	1.21			0.32
293	227.05	85.53	78.29	59.57		3.66
296	84.84	4.45	16.85	63.05		0.48
306	25.58	4.49	7.29	13.80		
307	158.15		10.35	147.75		0.06
313	34.33	4.14	3.25	26.10		0.85
314	9.16	6.86	2.29			
315	9.38	6.47	2.91			
316	59.38	47.77	11.58			0.02
318	12.66	10.36	2.30			
319	4.09	3.47	0.62			
358	19.71	16.29	3.36			0.06
359	16.42	15.00	1.41			0.00
1001	82.36	46.40	30.40	5.48		0.08
1002	4.56	3.26	0.95			0.35
SMC	0.06			0.00		0.05
SSF	141.42	1.24	7.23	128.54		4.41
357	14.87	9.17	5.45			0.25
356	10.22	8.17	2.04			0.01
354	5.23	4.42	0.80			0.00
352	0.23		0.01	0.22		
317	31.23	27.78	3.44			0.01
311	59.03		2.94	56.09		
298	79.64	5.71	9.53	64.21		0.20
297	25.81	0.63	4.19	20.99		
295	17.91	13.43	4.28			0.21

Updated Control Measure Plan for PCBs & Mercury in San Mateo County Stormwater Runoff (September 2022)

WMA ID	Total Area (Acres)	2002 Land Use (Acres)				
		Old Industrial	Old Urban - Commercial/ Transportation	Old Urban - Residential/ Parks	New Urban	Ag/Open
294	39.63	34.75	4.84			0.05
1001D	27.80	21.93	5.85			0.02
1001C	12.00	10.37	1.62			0.01
1001B	9.57	6.39	3.19			
TOTAL	1,330.54	486.97	246.25	585.79		11.53

1 – Acres presented may not include all acres currently treated by small inlet-based trash full capture devices.

2 – Includes only inlet-based trash full capture devices that are publicly owned and were installed by the City of South San Francisco between January 2010 and June 2022.

Other PCBs and Mercury Controls

SMCWPPP is continuing to evaluate whether other relevant PCBs and mercury control measures (e.g., enhanced municipal O&M) are present in the City of South San Francisco or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

4.19. Town of Woodside

Watershed Management Areas

Table 4.72 lists the two WMAs identified to-date in the Town of Woodside, and its total land area and associated land uses.

Table 4.72. Woodside WMAs and associated land uses.

WMA ID	Outfall Water Body	Total Area (Acres)	% Old Industrial	% Old Urban Commercial	% Old Urban Residential	% New Urban	% Open Space	% Other
261	Redwood Creek	46	0%	0%	98%	0%	2%	0%
WDE	Multiple	7,275	0%	5%	48%	2%	45%	0%

Existing and Planned Control Measures Summary

Table 4.73 provides a preliminary list of PCBs and mercury control measures currently in place or planned for future implementation in the Town of Woodside.

Table 4.73. Existing (E) and planned (P) PCBs and mercury control measures in Woodside WMAs.

WMA ID	Control Measure Categories									
	Source Property Investigation	Green Infrastructure and Treatment Control Measures	Trash Full Capture Systems	Managing PCBs during Building Demolition	Managing PCBs in Stormwater Conveyance Infrastructure	Operation and Maintenance Practices		Diversion to Wastewater Treatment Facilities	Addressing Illegally Dumped PCBs-containing Wastes	Reduction/Recycling of Mercury-containing Devices & Products
						Street Sweeping or Flushing	Inlet Cleaning			
261				E		E	E			E
WDE	E			E		E	E			E

Source Property Investigation

Source property investigative work has been conducted in the Town of Woodside to-date in WMA WDE. Updated results will be provided in the SMCWPPP’s UCMR due in March 2023.

Green Infrastructure

Based on the information compiled to-date, GI at new and redevelopment project sites have not been built since 2005 (the PCBs TMDL loading baseline year) in Woodside. There are currently 4.3 acres of land

that are planned or under construction for new or redevelopment. It should be noted that the information on GI reported in this section is preliminary and may be revised in the future as additional information becomes available.

Other PCBs and Mercury Controls

SMCWPPP is continuing to evaluate whether other relevant PCBs and mercury control measures (e.g., enhanced municipal O&M) are present in Woodside or should be planned there. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports.

5.0 PCBs AND MERCURY LOADS REDUCED

Preliminary PCBs and mercury loads reduced through stormwater control measures implemented in San Mateo County during the current MRP term are reported in this section. The loads reduced were quantified for those control measures and projects reported in Section 4.0 that were implemented and/or completed from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22).

In general, the load reductions reported in this section are preliminary and do not include all existing and planned control measures. For example, the load reductions reported in this section do not account for any contamination site cleanups (referred to as “self-abatements”) or some types of municipal O&M enhancements (e.g., channel desilting, enhanced street sweeping) implemented by Permittees during the permit term. Any load reductions during the permit term associated with these controls will be reported in future reports. SMCWPPP will continue to track all relevant control measures and update the associated load reduction calculations as additional information becomes available and as new or enhanced actions are implemented.

5.1. Summary of Loads Reduced Accounting Methodology

The accounting methodologies used to calculate the load reductions reported in this section were developed by BASMAA and approved by the Executive Officer of the Regional Water Board for the purpose of load reduction reporting during MRP 2.0. These methods and data inputs are described fully in the BASMAA *Interim Accounting Methodology Report* (BASMAA 2017). The equations and default data inputs that are used to calculate load reductions are summarized below. The data on acres addressed by each type of control measure that were reported in Section 4.0 were used in the equations below to calculate the PCBs and mercury load reductions.

Source Property Identification and Abatement

The projected POC loads reduced through source property identification and abatement were calculated using the equation below:

$$\text{Load of POC Reduced} = SP_A \cdot (SP_Y - OU_Y)$$

Where:

SP_A	=	Source property area (acres)
SP_Y	=	Source property POC yield
OU_Y	=	Old Urban land use POC yield

Default inputs:

PCBs Source property yield	=	4,065 mg/acre/year
PCBs Old urban land use yield	=	30.3 mg/acre/year
Mercury Source property yield	=	1,300 mg/acre/year
Mercury Old urban land use yield	=	215 mg/acre/year

Fifty percent of the load reduced is projected here for each anticipated source property referral that was identified in Section 4.0. (Per the MRP, the remaining 50% will be credited upon completion of the abatement process, or at ten years, whichever occurs first.)

Green Infrastructure and Treatment Controls

Parcel-Based GI/LID (e.g., New Development and Redevelopment)

The POC loads reduced through parcel-based new development, redevelopment, and retrofit projects were calculated using the equation below:

$$\text{Load of POC Reduced} = P_A \cdot (P_Y - NU_Y)$$

Where:

P_A	=	Project area (acre)
P_Y	=	Existing PCBs or mercury yield (mg/acre/year)
NU_Y	=	New Urban PCBs or mercury yield (mg/acre/year)

Default inputs:

PCBs New Urban land use yield	=	3.5 mg/acre/year
Mercury New Urban land use yield	=	33 mg/acre/year

Green Streets and Regional Retrofit Projects

The POC loads reduced due to green streets and regional retrofit projects were calculated using the equation and inputs provided below:

$$\text{Annual Mass of PCB Reduced} = P_A \cdot P_Y \cdot E_f$$

Where:

P_A	=	Tributary area treated (acres)
P_Y	=	Area-weighted PCBs or mercury yield (mg/acre-year)
E_f	=	Efficiency factor for green infrastructure/retrofit treatment control measure (assumed to be 70%)

Enhanced Operation and Maintenance Activities – Increased Inlet Cleanouts

The POC loads reduced due to enhanced inlet cleanouts were calculated using the equation and inputs provided below:

$$\text{Annual Mass of PCB Reduced} = P_A \cdot P_Y \cdot E_f$$

Where:

P_A	=	Tributary area treated (acres)
P_Y	=	Area-weighted PCBs or mercury yield (mg/acre-year)
E_f	=	Efficiency factor for increasing from annual to twice annual cleanouts (assumed to be 2%); in this report, POC load reductions for enhanced inlet cleanouts only accounts for the increased cleanout frequency due to installation and maintenance of inlet-based trash full capture devices; in future reports, the additional load reduction due to the increased capture of sediment-bound pollutants because of the inlet-based full trash capture devices will be documented in future reports.

5.2. PCBs Loads Reduced

Preliminary Estimated PCBs Loads Reduced from July 1, 2013 through June 30, 2022

The preliminary estimated PCBs loads reduced by San Mateo County Permittees from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) are shown in Table 5.1. Permittees achieved more than 339 g/year of PCBs load reductions cumulatively over this time period. Table 5.2 shows the PCBs loads reduced, itemized by control measure category. New and re-development projects have been and continue to be ongoing across all San Mateo County municipalities. Over the permit term to-date, 1,228 acres have been developed or redeveloped, including more than 460 acres of old industrial and 551 acres of old urban land uses. Green streets and regional retrofit projects have been constructed that treat an additional 44 acres of urban land uses. It is important to emphasize that the PCBs loads reduced that are reported here are preliminary and may not include all control measures that have been implemented by San Mateo County Permittees to-date. SMCWPPP will report on any additional controls and associated pollutant load reductions in future reports. Table 5.2 also illustrates that the 15 g/year PCBs load reduction through GI by the end of the permit term required by the MRP has been achieved.

In addition, as described in Section 4.15, during October 2018 SMCWPPP submitted two source property referrals (both in San Carlos) to the Regional Water Board. The total combined acreage of these properties is about 10 acres, resulting in an about 20 g/year PCBs load reduction (see Section 5.1 for the calculation methods).

Updated Control Measure Plan for PCBs & Mercury in San Mateo County Stormwater Runoff (September 2022)

Table 5.1. Preliminary estimates of PCBs loads reduced by San Mateo County Permittees from July 1, 2013 through June 30, 2022 (FY 2013/14 through FY 2021/22).

Permittee	PCBs Loads Reduced (g/year)									Cumulative Load Reduced
	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY20/21	FY21/22	
Atherton	0.03						2.80	0.20		3
Belmont	0.38		0.01	0.01	0.13	0.41	9.46			10
Brisbane	0.75		0.37		1.94	0.01	1.40	0.02		4
Burlingame	0.08	0.16	0.01	0.69	0.07	0.07	10.67	0.02	0.46	12
Colma	0.00	0.07		0.00	0.24	0.06	0.58	0.03		1
Daly City	0.06	0.18		0.51	2.25	0.05	38.90	0.09		42
East Palo Alto	0.12	0.24	0.03	0.36	0.02		15.33	0.18		16
Foster City	0.05		0.12	0.00	0.00	0.51	11.05	0.10		12
Hillsborough			0.00		0.00		4.09	0.00		4
Menlo Park	2.20	0.21	1.61	0.69	3.74	0.06	11.98	2.77	0.72	24
Millbrae	0.51				2.06		7.77	0.02		10
Portola Valley					0.04		1.66		0.31	2
Redwood City	0.65	1.09	0.67	0.46	0.64	1.24	28.21	0.91	0.03	34
San Bruno	0.16		0.50			0.14	15.11			16
San Carlos	2.20		0.75		21.69		10.94	1.15	0.03	37
San Mateo City	2.56	0.52	0.32	0.23	0.18	0.14	37.52	0.10	3	45
San Mateo County	1.42	0.36	0.34	0.05	0.09		23.17	0.19	0.05	26
South San Francisco	4.70	1.46	0.09	0.30	1.05	1.68	24.68	3.56		38
Woodside							2.06			2
Total	16	4	5	3	34	4	257	9	6	339

Table 5.2. Preliminary estimates of PCBs loads reduced in San Mateo County by control measure category from July 1, 2013 through June 30, 2022 (FY 2013/14 through FY 2021/22).

Control Measure Category		PCBs Loads Reduced (g/year)									
		FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY20/21	FY21/22	Cumulative Load Reduced
Source Property Identification and Referral	270 Industrial Road / 495 Bragato Road, San Carlos					16					16
	977 and 1007/1011 Bransten Road, San Carlos					5					5
GI and Other Stormwater Treatment Controls	Parcel-based GI/LID (i.e., new and redevelopment projects)	10	4	4	3	11	4	5	9	3	53
	Green Streets and Regional Retrofits	0.01	0.10	0.07	0.02	0.05	0.06	0.55	0.33	0.05	1.2
	Large Full Trash Capture Systems ³	2				2		4		2.9	12
Enhanced O&M Measures ⁴		3	0.1	0.5	0.7		0.2	0.1			5
Manage PCBs in Building Materials ⁴								247			247
Manage PCBs in Infrastructure ⁴											0
Diversion to POTW ⁴											0
Source Controls / Other ⁴											0
Total – All San Mateo County Permittees and Controls		16	4	5	3	34	4	257	9	6	339

1. Load Reduced = (Source Property Area (acre)) x (4.065 – 0.0303 (g/acre/year)).
2. For parcel-based projects, Load Reduced = (Project Area (acre)) x (Existing Yield – 0.0035 (g/acre/year)). For green street or regional retrofit projects, Load Reduced = (Project Drainage Area (ac)) x (area-weighted PCBs yield (g/acre/year)) x 0.70. See Section 4.0 for acres associated with this control measure.
3. Load Reduced = (Project Drainage Area (acre)) x (area-weighted PCBs yield (g/acre/year)) x 0.20.
4. Loads reduced = (Project Drainage Area (acres)) X (area-weighted PCBs yield (g/acre/year) x 2% (assumed efficiency factor for enhanced inlet cleanouts twice annually).

5.3. Mercury Loads Reduced

Preliminary Estimated Mercury Loads Reduced from July 1, 2013 through June 30, 2022

The preliminary estimated mercury loads reduced by San Mateo County Permittees from July 1, 2013 through June 30, 2022 (i.e., FY 2013/14 through FY 2021/22) are shown in Table 5.3. San Mateo County Permittees have achieved more than 848 g/year of mercury load reductions over this time period. Table 5.4 shows the mercury loads reduced by control measure category. New development and redevelopment projects currently account for 81% of the mercury load reduction reported to-date. Large full trash capture systems account for an additional 11% of the mercury load reduction reported to-date. Enhanced inlet cleanouts account for about 6% of the mercury load reduction reported to-date. Green streets and regional retrofit projects account for the remaining 1%. Table 5.4 also illustrates that the 6 g/year mercury load reduction through GI by the end of the permit term required by the MRP has been achieved.

Table 5.3. Preliminary estimates of mercury loads reduced by San Mateo County Permittees from July 1, 2013 through June 30, 2022 (FY 2013/14 through FY 2021/22).

Permittee	Mercury Loads Reduced (g/year)									Cumulative Load Reduced
	FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY20/21	FY21/22	
Atherton	0.2						0.7	1.4		2.3
Belmont	3.1		0.1	0.1	0.8	4.5	0.1			9
Brisbane	11.4		4.8		29.6	0.1	0.5	0.1		47
Burlingame	0.7	1.5	0.1	9.7	0.8	0.5	0.8	0.0	6.9	21
Colma	0.0	0.5		0.0	1.6	0.4	0.6	0.2		3
Daly City	0.4	1.2		3.5	15.2	0.6	0.1	0.6		22
East Palo Alto	1.6	3.5	0.2	5.2	0.1		33.7	2.8		47
Foster City	0.3		0.8	0.0	0.0	7.2	2.5	0.7		12
Hillsborough			0.0		0.0			0.0		0.04
Menlo Park	31.7	2.5	21.0	9.3	56.4	0.4	5.3	39.4	10.9	177
Millbrae	3.9				15.4		0.1	0.1		19
Portola Valley					0.3				2.1	2.4
Redwood City	7.2	14.2	8.2	5.4	6.0	15.2	0.0	8.0	0.3	64
San Bruno	1.1		7.2			1.3	0.5			10
San Carlos	30.1		11.4		15.1		6.7	17.3	0.2	81
San Mateo City	24.3	7.4	2.4	1.5	1.5	1.2	18.3	0.7	38	95
San Mateo County	10.1	5.0	2.3	0.4	0.8		2.0	1.3	0.4	22
South San Francisco	66.0	22.3	0.6	4.1	15.9	23.6	27.8	53.7		214
Woodside										0
Total	192	58	59	39	160	55	100	126	59	848

Table 5.4. Preliminary estimates of mercury loads reduced in San Mateo County by control measure category from July 1, 2013 through June 30, 2022 (FY 2013/14 through FY 2021/22).

Control Measure Category		Mercury Loads Reduced (g/year)									Cumulative Load Reduced
		FY 13/14	FY 14/15	FY 15/16	FY 16/17	FY 17/18	FY 18/19	FY 19/20	FY20/21	FY21/22	
Source Property Identification and Referral	270 Industrial Road / 495 Bragato Road, San Carlos					4					4
	977 and 1007/1011 Bransten Road, San Carlos					1					1
GI and Other Stormwater Treatment Controls	Parcel-based GI/LID (i.e., new and redevelopment projects)	136	57	53	31	138	53	56	123	35	683
	Green Streets and Regional Retrofits	0.08	0.72	0.51	0.11	0.38	0.40	6.80	3.47	0.49	13
	Large Full Trash Capture Systems ³	20				15		36		23	94
Enhanced O&M Measures ⁴		36	0	6	8		1	1			53
Diversion to POTW ⁴											0
Total – All San Mateo County Permittees and Controls		192	58	59	39	160	55	100	126	59	848

1. Load Reduced = (Source Property Area (acre)) x (1.033 – 0.215 (g/acre/year)).
2. For parcel-based projects, Load Reduced = (Project Area (acre)) x (Existing Yield – 0.033 (g/acre/year)). For green street or regional retrofit projects, Load Reduced = (Project Drainage Area (ac)) x (area-weighted mercury yield (g/acre/year)) x 0.70. See Section 4.0 for acres associated with this control measure.
3. Load Reduced = (Project Drainage Area (acre)) x (area-weighted mercury yield (g/acre/year)) x 0.20.
4. Loads reduced = (Project Drainage Area (acres)) X (area-weighted mercury yield (g/acre/year) x 2% (assumed efficiency factor for enhanced inlet cleanouts twice annually).

Mercury Mass Collected via Countywide Hazardous Waste Collection Program

San Mateo County municipalities participate in San Mateo County Health Department's Household Hazardous Waste (HHW) Program and Very Small Quantity Generator Business Collection (VSQG) Program (see Section 3.8). The estimated mass of mercury collected in FY 2017/18 through FY 2020/21 via these programs is shown in Table 5.5.⁶ It should be noted that these mass estimates are not directly comparable to pollutant load reductions in stormwater runoff discharges.

⁶ The HHW Program canceled all collections from March 12 through June 3, 2020 due to the COVID-19 Shelter-in-Place order. This generally resulted in a relatively lower number of devices and associated mass of mercury collected in FY 2019/20.

Table 5.5. Estimated mercury mass collected via the San Mateo County Health Department's Household Hazardous Waste (HHW) and Very Small Quantity Generator Business Collection (VSQG) programs.

Mercury Containing Device/Equipment	FY 2017/18		FY 2018/19		FY 2019/20		FY 2020/21		FY 2021/22	
	Total Amount of Devices Collected	Estimated Mass of Mercury Collected (kg)	Total Amount of Devices Collected	Estimated Mass of Mercury Collected (kg)	Total Amount of Devices Collected	Estimated Mass of Mercury Collected (kg)	Total Amount of Devices Collected	Estimated Mass of Mercury Collected (kg)	Total Amount of Devices Collected	Estimated Mass of Mercury Collected (kg)
Fluorescent Lamps (linear ft) ^{1,2}	125,582	0.3	107,269	0.2	77,004	0.2	148,912	0.3	112,938	0.2
CFLs (each) ³	18,689	0.1	18,513	0.1	10,014	0.05	7,633	0.03	8,843	0.04
Thermostats (each) ⁴	11	0.04	15	0.1	8	0.03	14	0.1	12	0.0
Thermometers (each) ⁵	0	0	25	0.02	6	0.004	45	0.03	115	0.07
Switches (each)	0	0	26	0.1	0	0	45	0.1	26	0.1
Total Mass of Mercury Collected (Kg)		0.4		0.5		0.2		0.6		0.5

6.0 DISCUSSION AND NEXT STEPS

Building on the efforts described in this report, SMCWPPP and San Mateo County MRP Permittees plan to continue to work together to conduct a variety of activities to continue addressing MRP requirements for PCBs and mercury and making progress towards achieving the TMDL allocations, including the following tasks:

- A new sub-provision in the reissued permit (MRP 3.0) will require Permittees to implement control measures in some portion of old industrial and/or other areas that generally have moderate to high PCBs concentrations. SMCWPPP has convened a workgroup of municipalities in San Mateo County that have the greatest extent of old industrial land use areas. The workgroup will continue meeting periodically during FY 2022/23 to explore implementing additional potential actions to address PCBs such as the following:
 - Develop a long-term plan for old industrial areas in San Mateo County that identifies (as feasible) the specific geographic areas projected to redevelop and considers realistic time horizons for redevelopment and the added potential benefit of progressive policies to address roadway frontages as part of redevelopment.
 - Increase efforts to find funding (e.g., from Caltrans) to implement trash full capture and multi-benefit stormwater capture projects that would treat old industrial land uses or other areas with moderate to high PCBs.
 - Consider expanding the source property identification work to prioritize more moderate areas and possibly expand the municipal role in investigating and abating such properties as feasible and appropriate.
 - Explore additional opportunities, if any, to periodically remove PCBs-containing sediments that accumulate in stormwater drainage infrastructure (e.g., piping, inlets, pump station wet wells, detention ponds).
 - Conduct parcel-scale GIS analyses of relevant characteristics of old industrial areas (e.g., existing and planned controls, projected redevelopment patterns, PCBs screening and monitoring data) and develop color-coded maps and other on-line tools to visualize data, illustrate current status, and inform planning.
- SMCWPPP will continue to work with other Bay Area stormwater management programs to evaluate data collected during the programs to manage PCBs materials during building demolition in compliance with Provision C.12.f.
- SMCWPPP will continue to participate in the RMP PCBs Work Group to help oversee RMP studies concerning the fate, transport, and biological uptake of PCBs discharged from urban runoff to San Francisco Bay margin areas. A continued focus will be the conceptual model under development for Steinberger Slough in San Mateo County and associated monitoring fieldwork by the RMP.
- SMCWPPP will continue to work with San Mateo County Environmental Health Services (EHS) on education and outreach efforts to San Mateo County residents likely to consume locally caught fish from the Bay. EHS's Fish Smart program conducts a variety of related activities, such as maintenance of strategically placed signs, training of healthcare workers to disseminate information, and targeted social media posts.

- Green infrastructure and regional stormwater capture projects are an important part of San Mateo County Permittees' overall efforts to reduce loadings of PCBs, mercury, and other pollutants to the Bay and make progress towards TMDL objectives. C/CAG will continue advancing the Regional Project Planning and Collaborative Framework, including developing the initial phase of a proposed MOU-based program. New program elements and outputs may include development and legal review of an interim MOU-based Regional Collaborative Program, documents supporting initial pilot cost-sharing (e.g., a model MOU and/or interagency agreement, and O&M certification or other credit certification documents), and implementation of initial cost-sharing arrangements on a pilot project. C/CAG will also continue supporting, as needed, the Cities of San Bruno, Belmont, and Redwood City on advancing designs and environmental review for regional stormwater capture projects and seek new partnership and funding opportunities to advance existing concepts for additional regional projects from preliminary design towards implementation.

7.0 REFERENCES

- BASMAA (2017). *Interim Accounting Methodology for TMDL Loads Reduced*. Prepared by Geosyntec Consultants and EOA, Inc. for the Bay Area Stormwater Management Agencies Association (BASMAA). March 23, 2017.
- CW4CB (2017a). *Source Property Identification Pilot Study, Pulgas Creek Pump Station Watershed, San Carlos, California*. A Pilot Project of the Clean Watersheds for a Clean Bay (CW4CB) USEPA Grant-Funded Project. May 2017.
- CW4CB (2017b). *Street Flush and Capture Pilot Study, Pulgas Creek Pump Station Watershed, San Carlos, California*. A Pilot Project of the Clean Watersheds for a Clean Bay (CW4CB) USEPA Grant-Funded Project. May 2017.
- CW4CB (2017c). *Stormwater Runoff Treatment Retrofit Pilot Projects, Bransten Road Bioretention Facilities, Pulgas Creek Pump Station Watershed, San Carlos, CA*. A Pilot Project of the Clean Watersheds for a Clean Bay (CW4CB) USEPA Grant-Funded Project. May 2017.
- KLI and EOA 2002. *Joint Stormwater Agency Project to Study Urban Sources of Mercury, PCBs and Organochlorine Pesticides*. Prepared for SCVURPPP, CCCWP, SMCSPPP, MCSPPP, VFCS, and FSSD. April 2002.
- SMCWPPP (2014). *Draft Delineation of Storm Drain Catchments and Prioritization for Trash Controls*. Prepared for the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. April 28, 2014.
- SMCWPPP (2015a). *PCBs and Mercury Source Area Identification, Water Year 2015 POC Monitoring Report*. Appendix to WY 2015 UCMR. Prepared for San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. September 2015.
- SMCWPPP (2015b). *Evaluation of Pilot Urban Runoff Diversion to Reduce PCBs and Mercury Loadings to San Francisco Bay*. San Mateo Countywide Water Pollution Prevention Program (SMCWPPP). September 2015.
- SMCWPPP (2016a). *Progress Report: Identification of Watershed Management Areas for PCBs and Mercury*. Prepared for San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. April 1, 2016.
- SMCWPPP (2016b). *Identifying Management Areas and Controls for Mercury and PCBs in San Mateo County Stormwater Runoff*. Prepared for San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. September 30, 2016.
- SMCWPPP (2017a). *Urban Creeks Monitoring Report, Water Quality Monitoring, Water Year 2016 (October 2015 – September 2016)*. Prepared for San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. March 31, 2017.

SMCWPPP (2017b). *Control Measure Plan for PCBs and Mercury in San Mateo County Stormwater Runoff*. Prepared for San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. September 30, 2017.

SMCWPPP (2018a). *Urban Creeks Monitoring Report, Water Quality Monitoring, Water Year 2017 (October 2016 – September 2017)*. Prepared for San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. March 31, 2018.

SMCWPPP (2018b). *Updated Control Measure Plan for PCBs and Mercury in San Mateo County Stormwater Runoff*. Prepared for San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. September 30, 2018.

SMCWPPP (2019a). *Urban Creeks Monitoring Report, Water Quality Monitoring, Water Year 2018 (October 2017 – September 2018)*. Prepared for San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. March 31, 2019.

SMCWPPP (2019b). *Updated Control Measure Plan for PCBs and Mercury in San Mateo County Stormwater Runoff*. Prepared for San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. September 30, 2019.

SMCWPPP (2020a). *Integrated Monitoring Report, Part D: Pollutants of Concern Monitoring Report, Data Collected in San Mateo County through Water Year 2019*. Prepared for San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. March 31, 2020.

SMCWPPP (2020b). *Pollutant Control Measures Implementation Plan and Reasonable Assurance Analysis for San Mateo County, California. Scenarios to Achieve PCBs and Mercury San Francisco Bay TMDL Wasteload Allocations*. Prepared for San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. September 30, 2020.

SMCWPPP (2021a). *Urban Creeks Monitoring Report, Water Quality Monitoring, Water Year 2020 (October 2019 – September 2020)*. Prepared for San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. March 31, 2021.

SMCWPPP (2021b). *Pollutant Control Measures Implementation Plan and Reasonable Assurance Analysis for San Mateo County, California. Scenarios to Achieve PCBs and Mercury San Francisco Bay TMDL Wasteload Allocations*. Prepared for San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. September 30, 2021.

SMCWPPP (2022). *Urban Creeks Monitoring Report, Water Quality Monitoring, Water Year 2021 (October 2020 – September 2021)*. Prepared for San Mateo Countywide Water Pollution Prevention Program (SMCWPPP) by EOA, Inc., Oakland, California. March 31, 2022.

SMSTOPPP (2002). *Case Study Investigating Elevated Levels of PCBs in Storm Drain Sediments in San Mateo County*. Prepared for San Mateo Countywide Stormwater Pollution Prevention Program (SMSTOPPP) by EOA, Inc., Oakland, California. April 15, 2002.

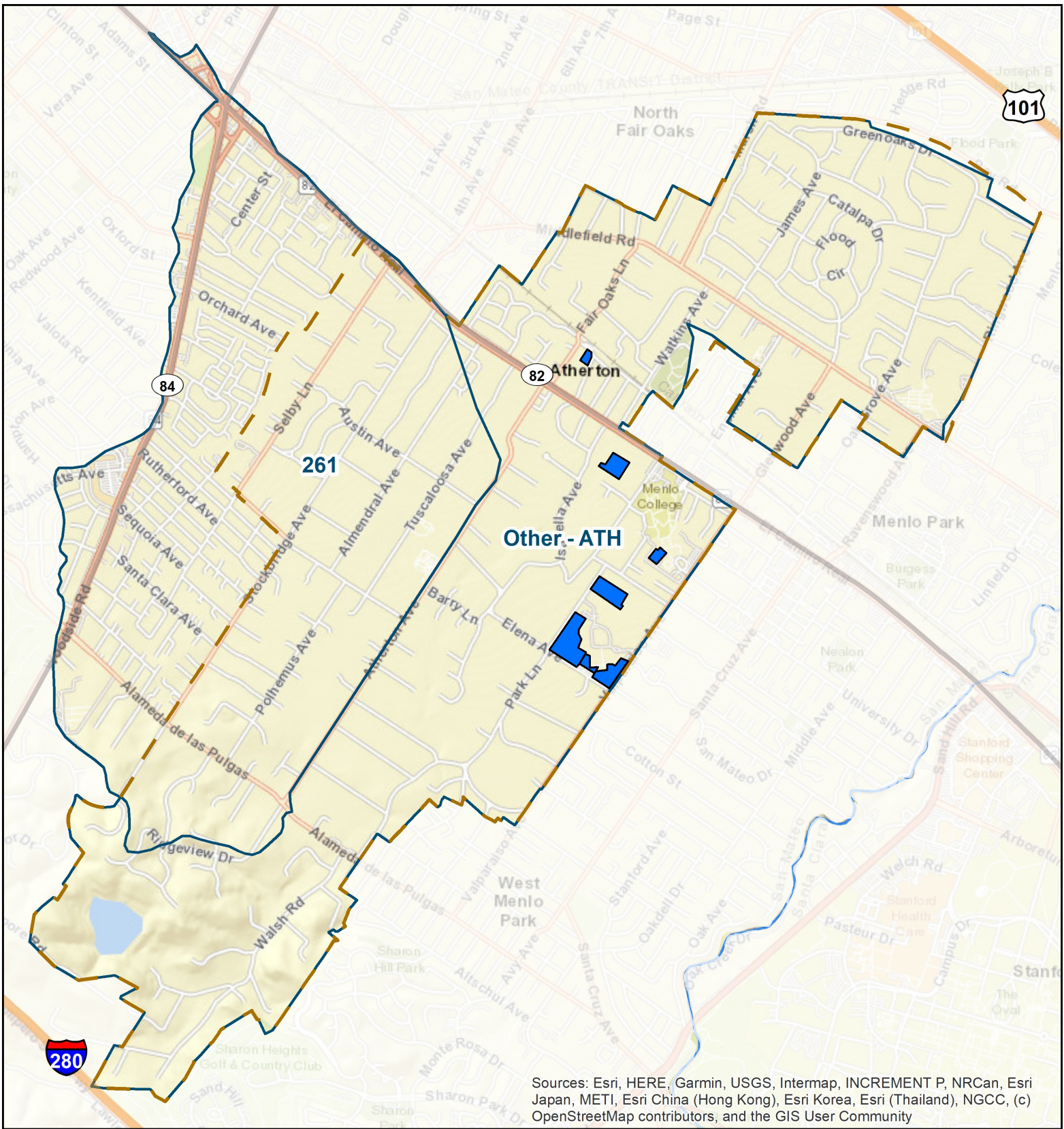
SMSTOPPP (2003). *Case Study Investigating Elevated Levels of PCBs in Storm Drain Sediments in the Pulgas Creek Pump Station Drainage, San Carlos, California*. Prepared for San Mateo Countywide Stormwater Pollution Prevention Program (SMSTOPPP) by EOA, Inc., Oakland, California. June 2003.

SMSTOPPP (2004). *Case Study Investigating PCBs in Storm Drain Sediments from Colma Creek, Colma, California*. Prepared for San Mateo Countywide Stormwater Pollution Prevention Program (SMSTOPPP) by EOA, Inc., Oakland, California. May 2004.

Yee, D., and McKee, L.J. (2010). *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, California. March 31, 2010.

Appendix A

Maps for each San Mateo County Permittee showing WMAs
and GI/LID facilities



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

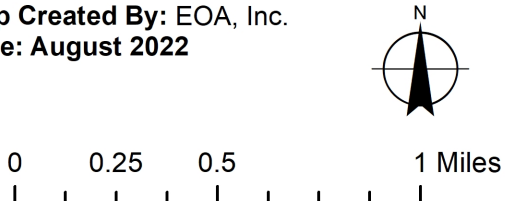
Figure A-1. WMAs and GI/LID in Atherton

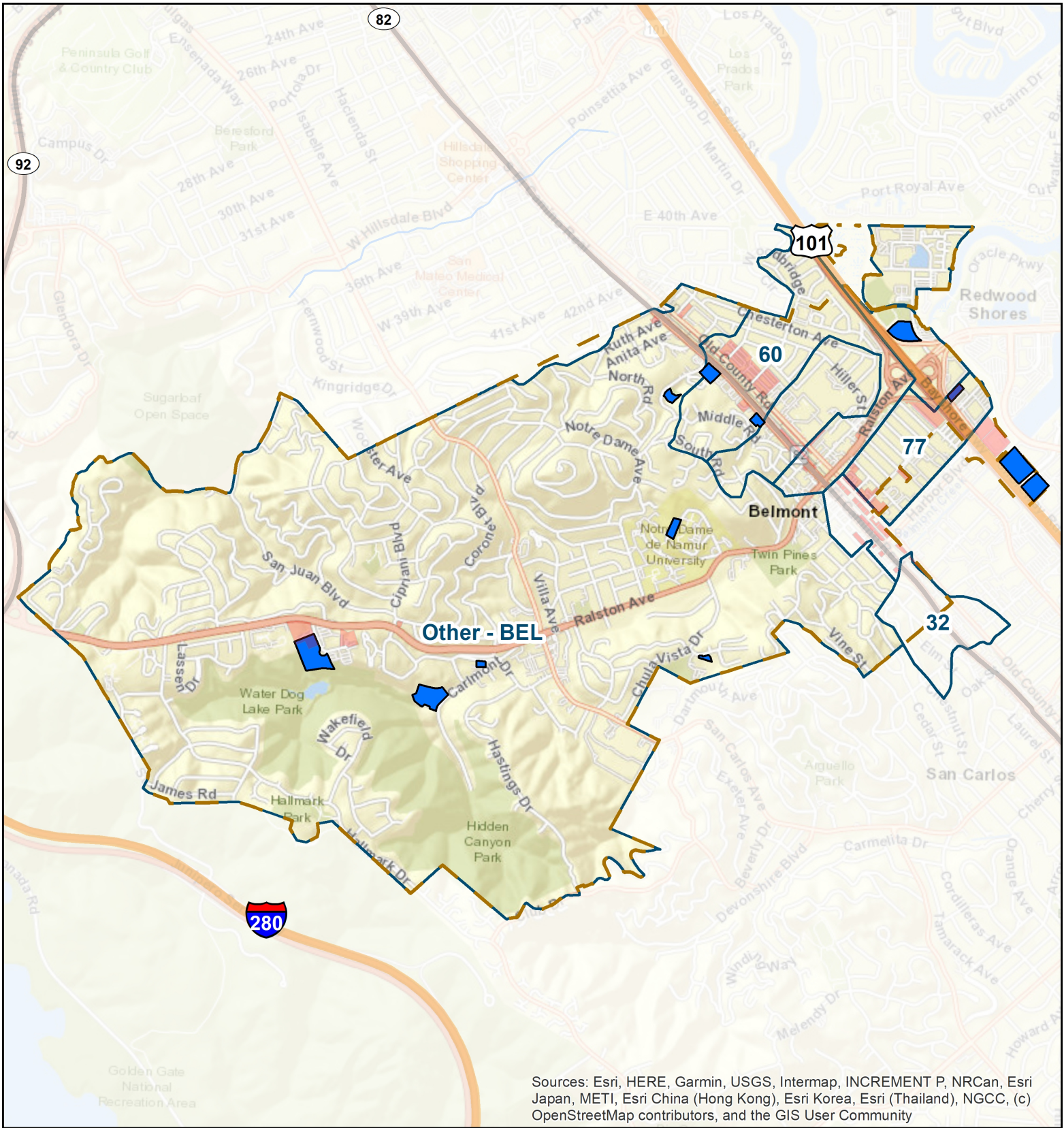
Atherton Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022





Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

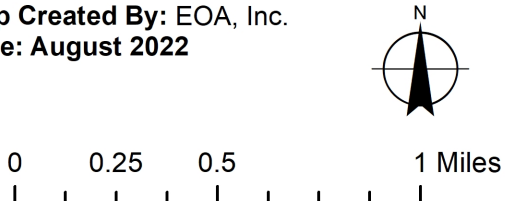
Figure A-2. WMAs and GI/LID in Belmont

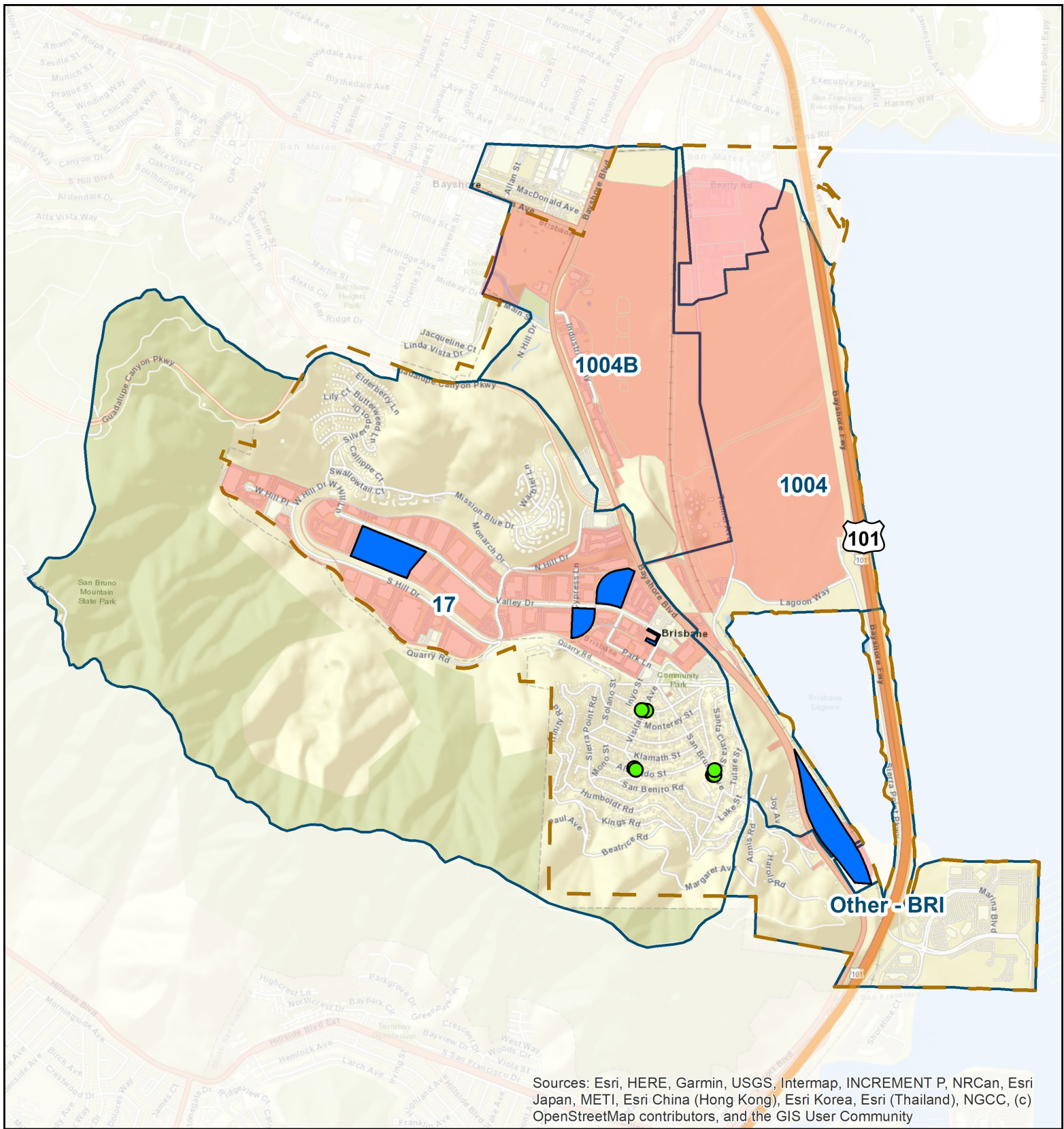
Belmont Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- Watershed Management Area (WMA)
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022





Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

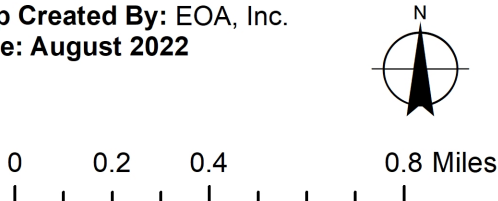
Figure A-3. WMAs and GI/LID in Brisbane

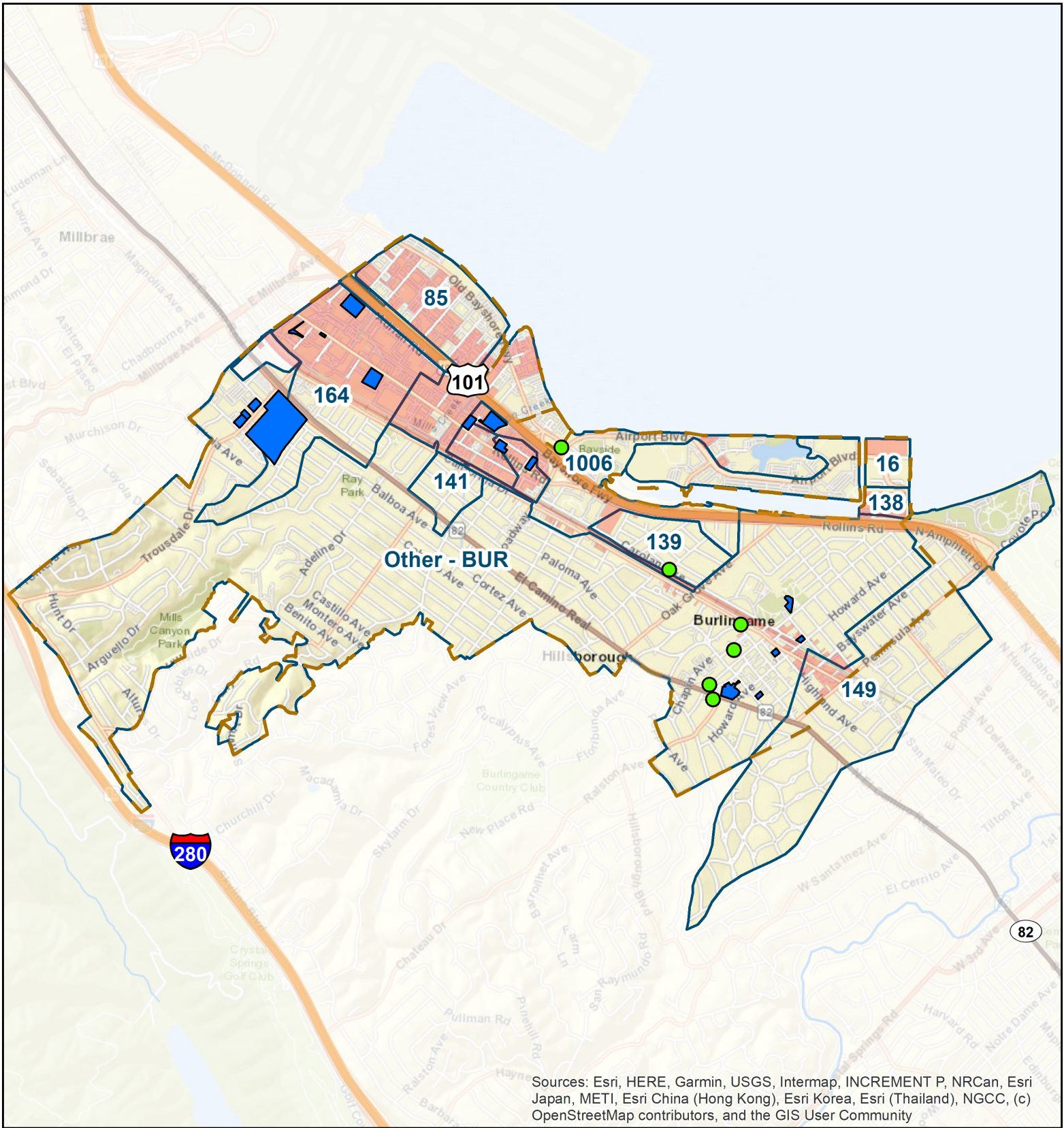
Brisbane Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022





Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

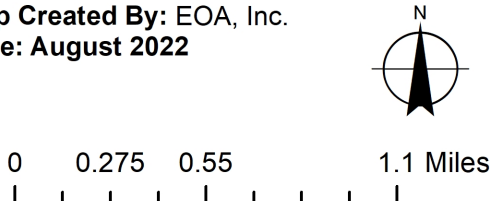
Figure A-4. WMAs and GI/LID in Burlingame

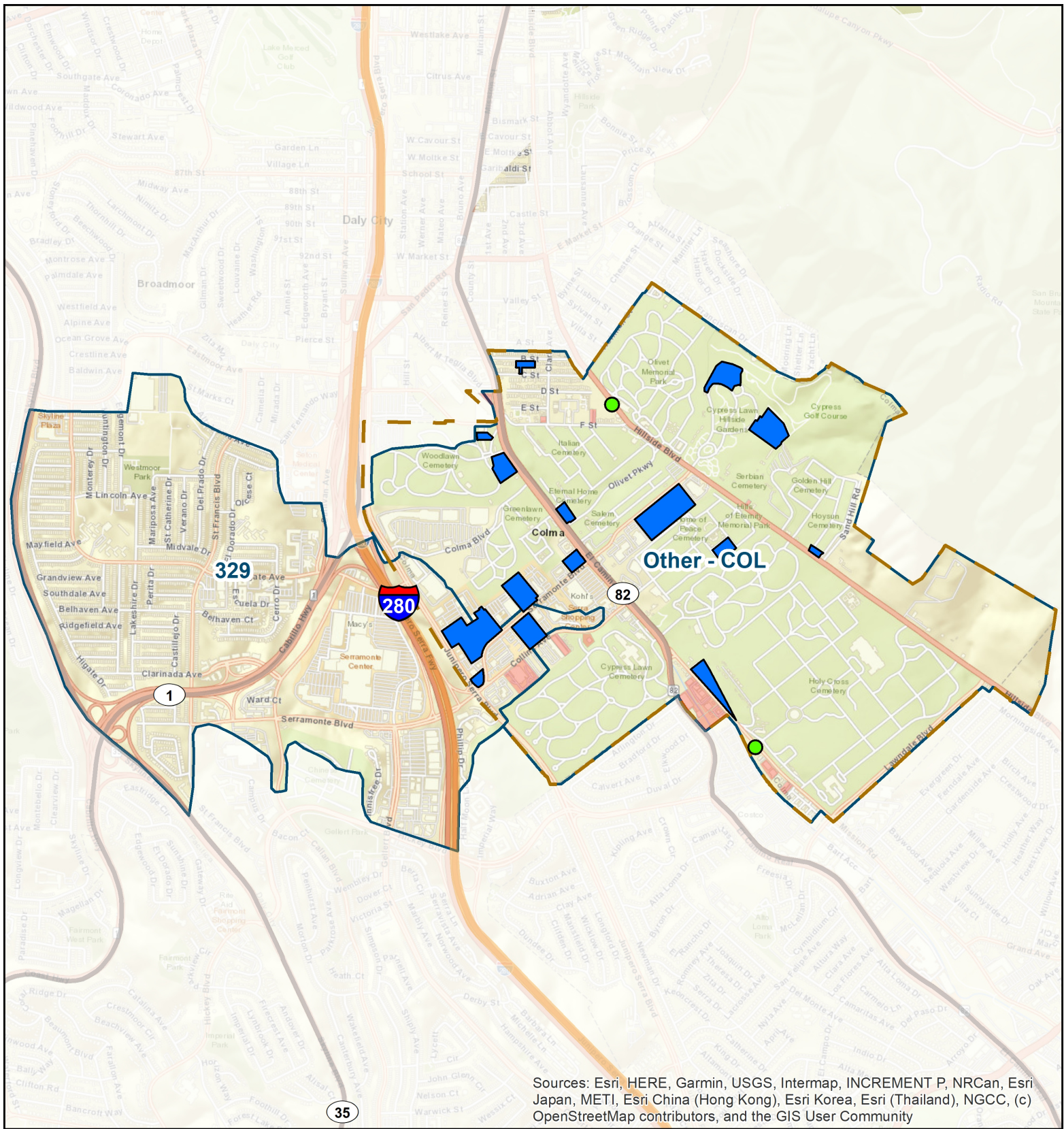
Burlingame Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022





Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Figure A-5. WMAs and GI/LID in Colma

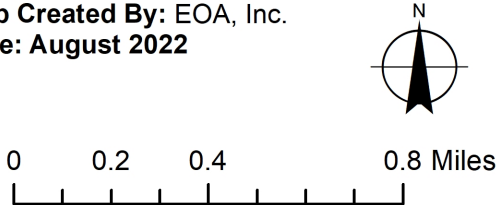
Colma Watershed Management Area Map

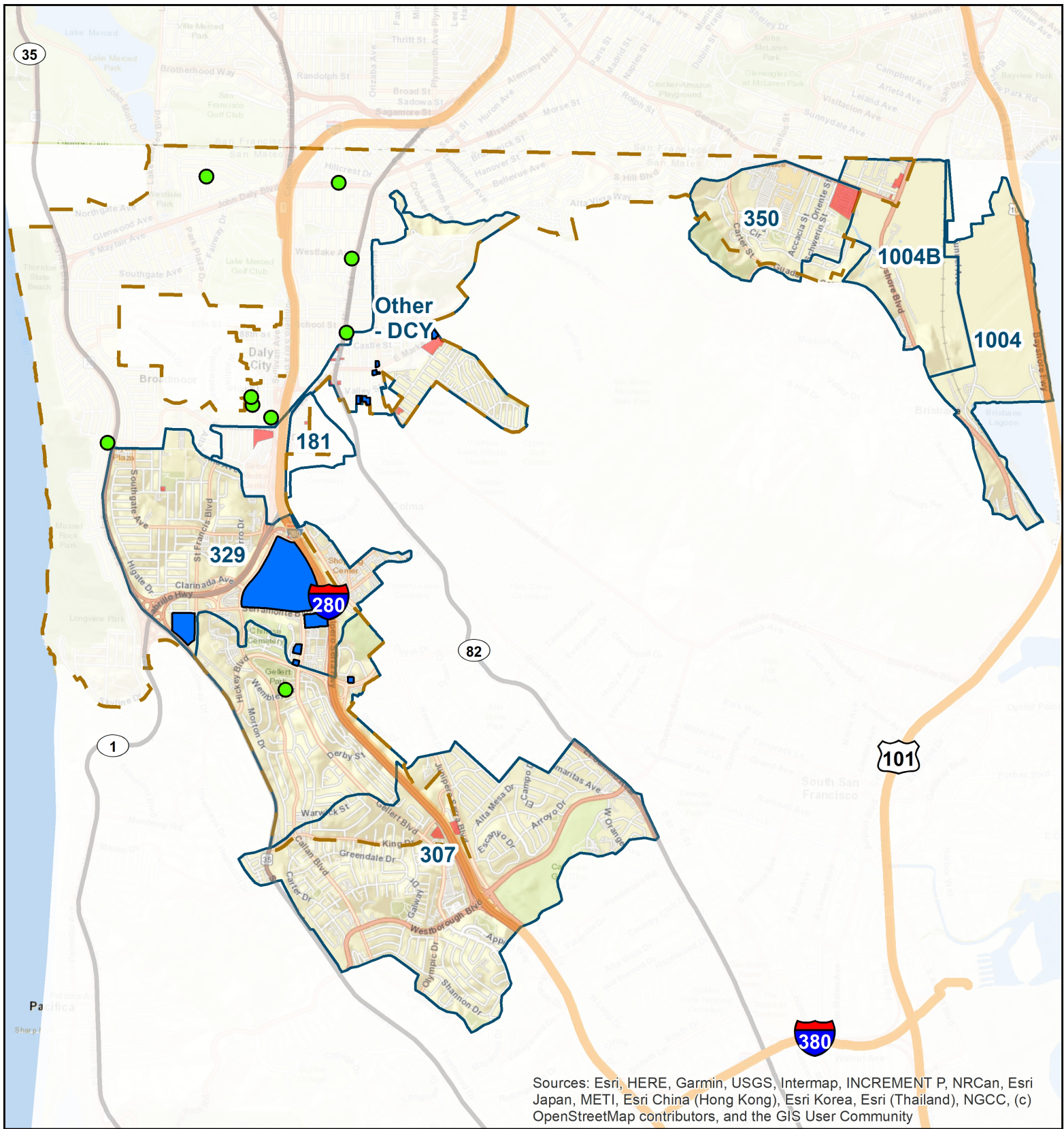
- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:

- City Boundaries:** San Mateo County
- Catchment Boundaries:** Mattern/WLA
- Background:** ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022





Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

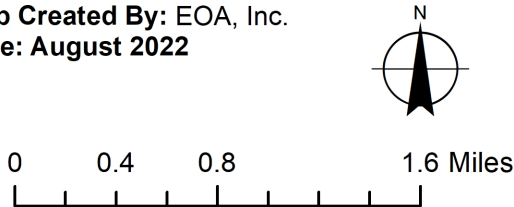
Figure A-6. WMAs and GI/LID in Daly City

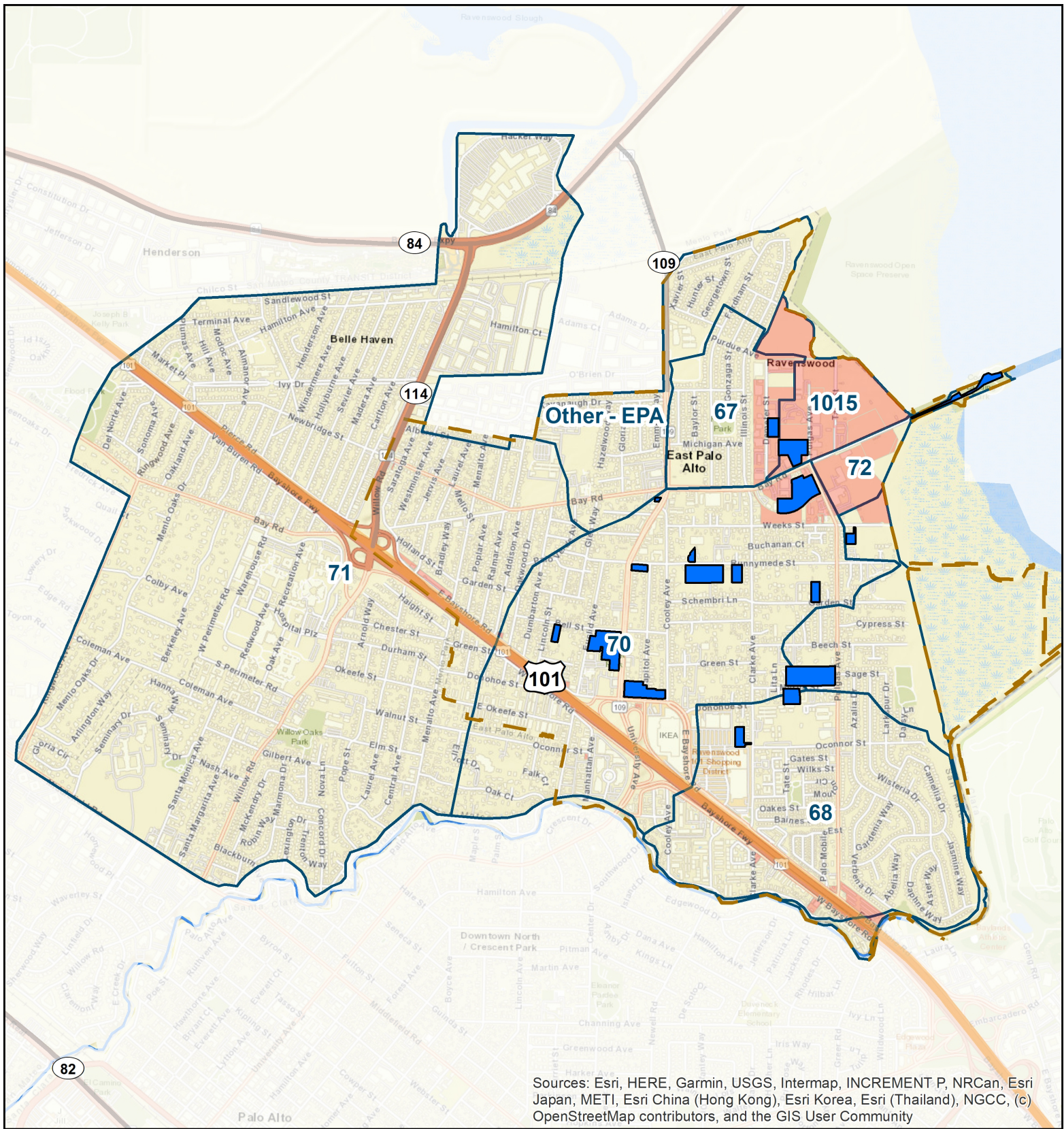
Daly City Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022





Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCAN, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

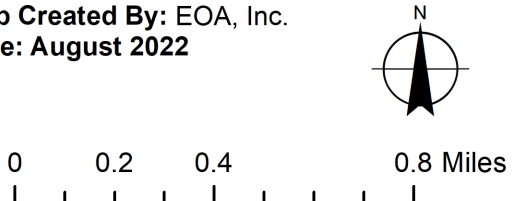
Figure A-7. WMAs and GI/LID in East Palo Alto

East Palo Alto Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022



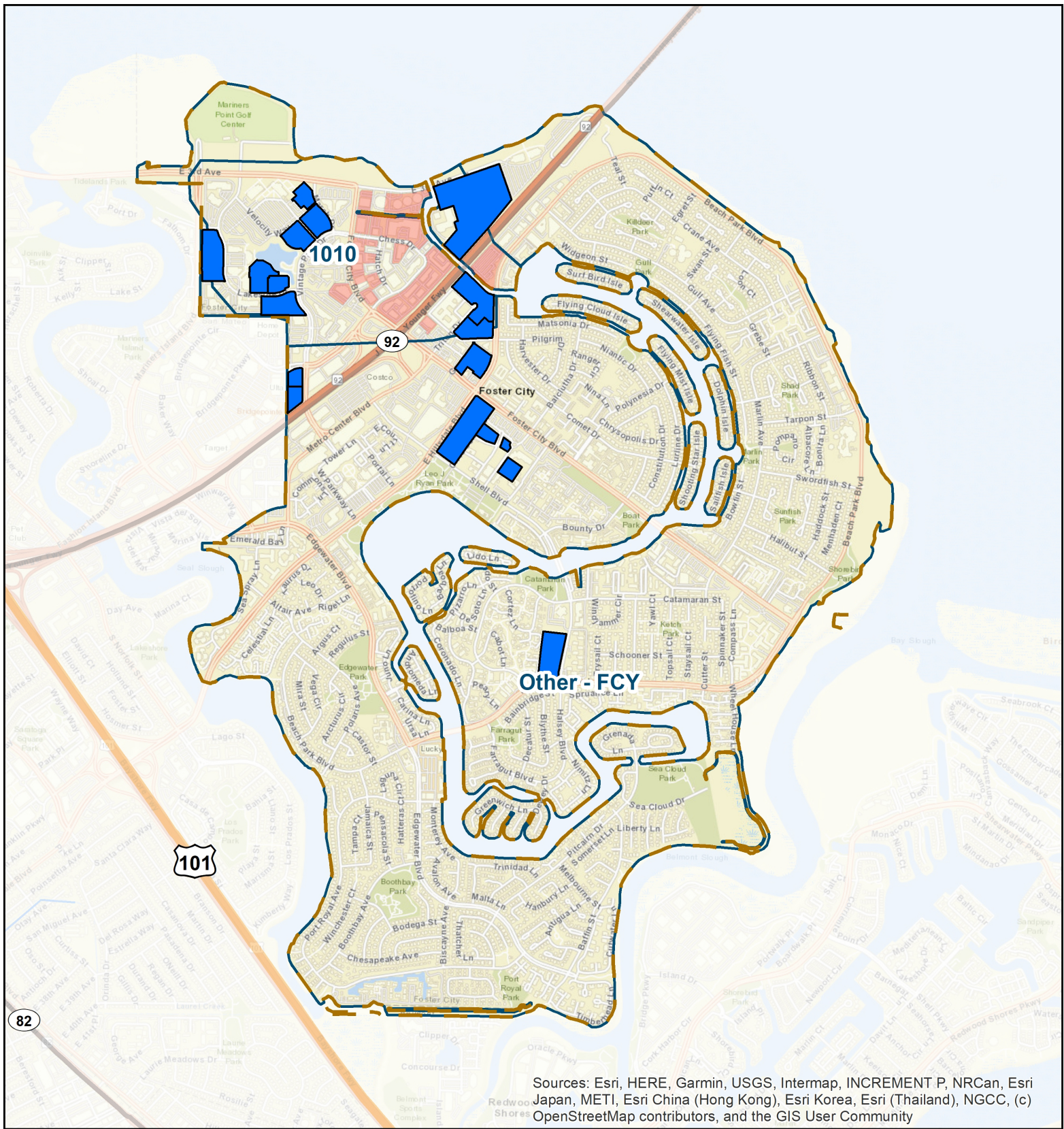


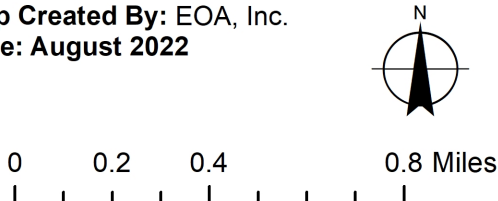
Figure A-8. WMAs and GI/LID in Foster City

Foster City Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022



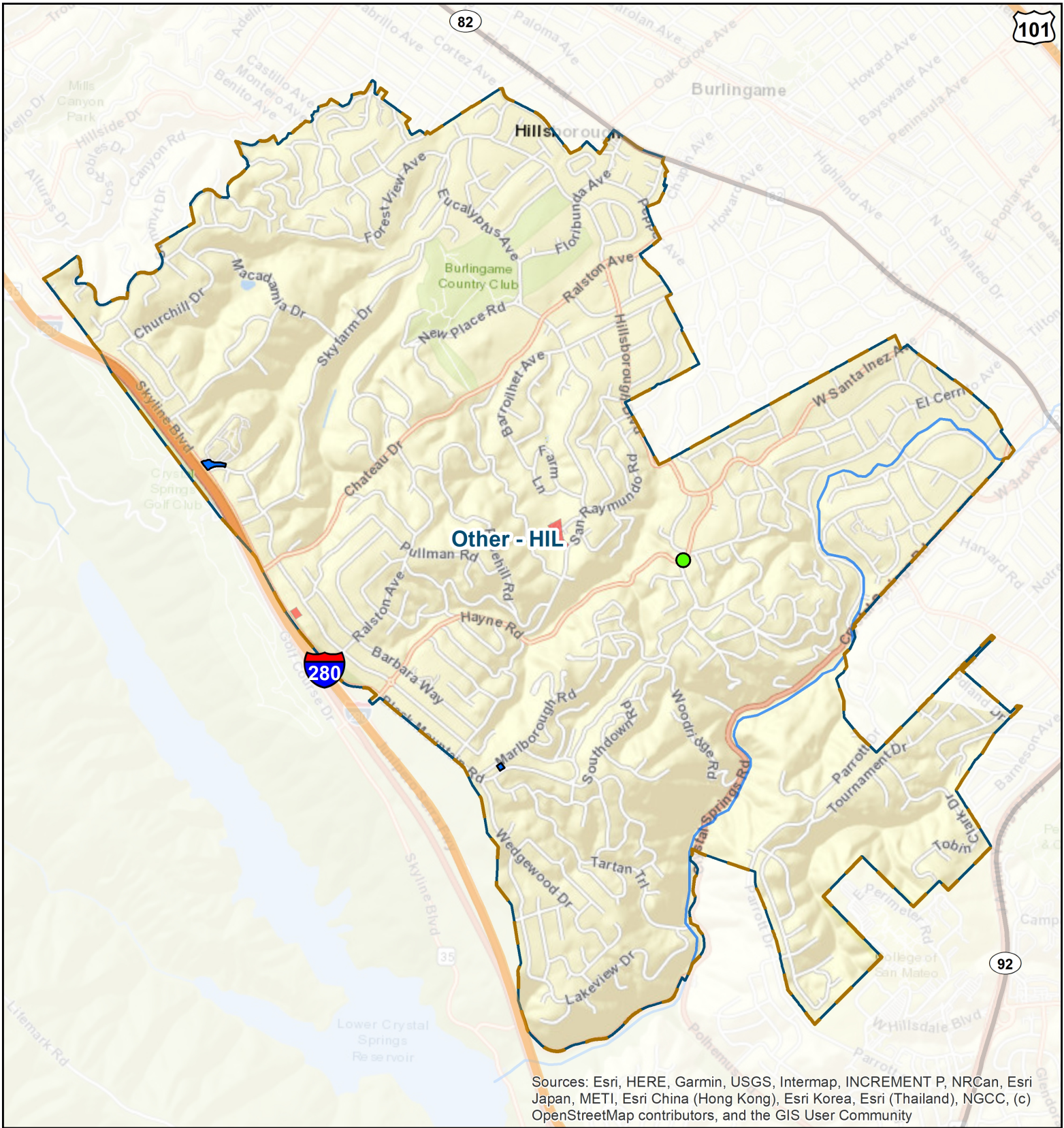


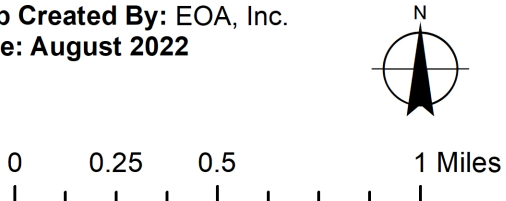
Figure A-9. WMAs and GI/LID in Hillsborough

Hillsborough Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022



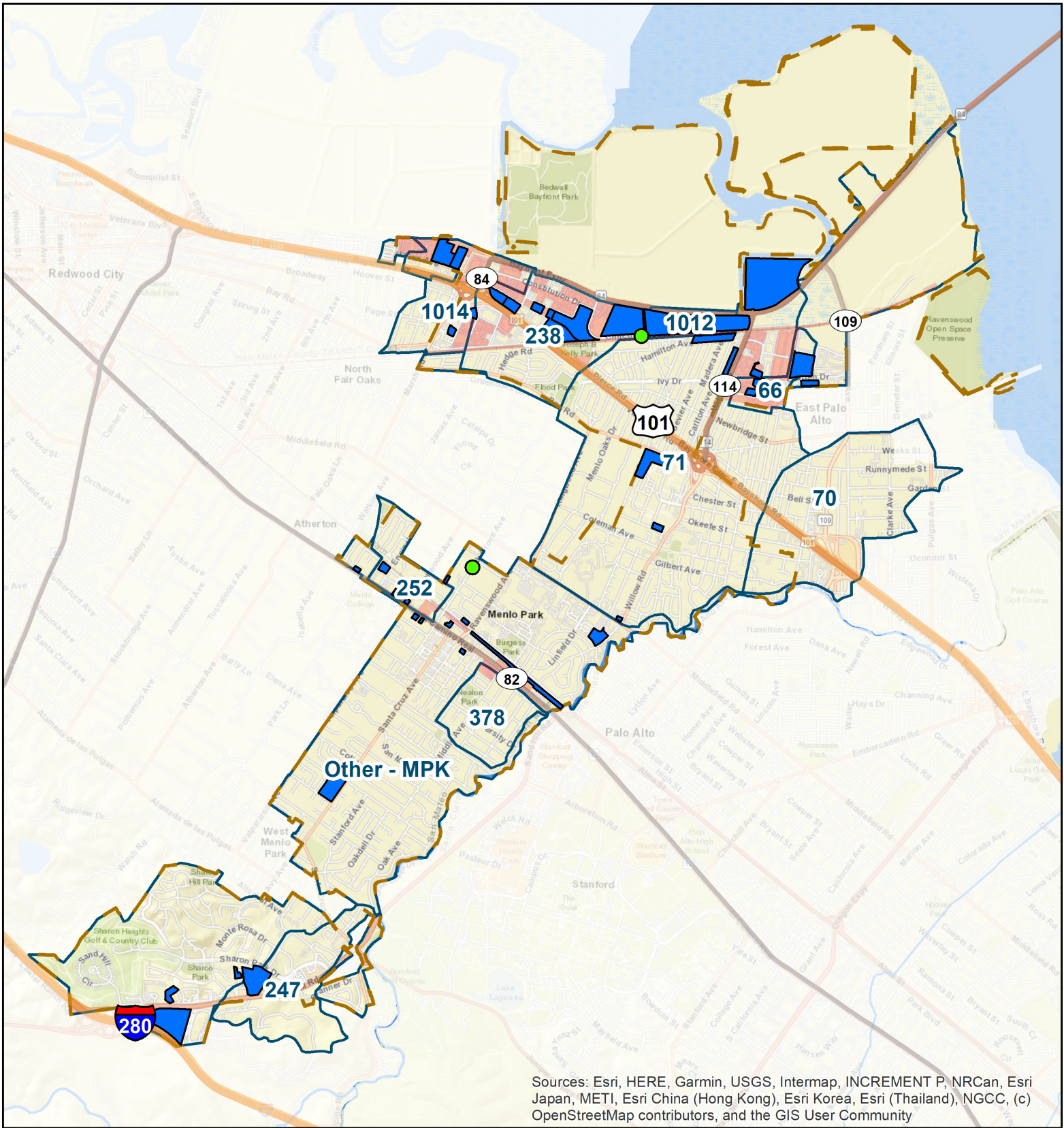


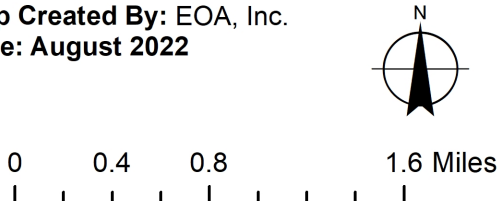
Figure A-10. WMAs and GI/LID in Menlo Park

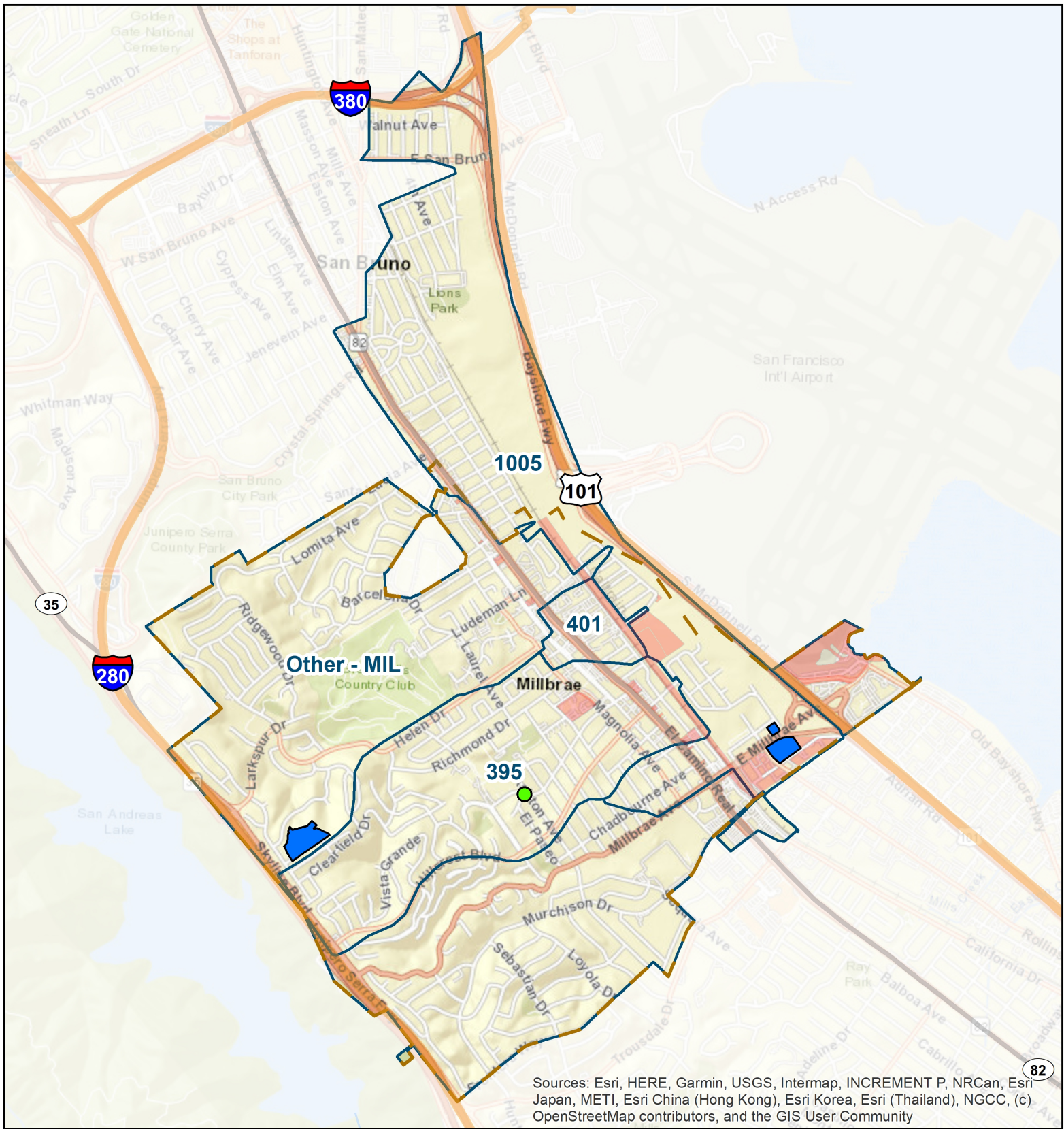
Menlo Park Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022





Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

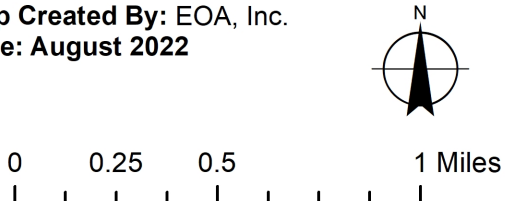
Figure A-11. WMAs and GI/LID in Millbrae

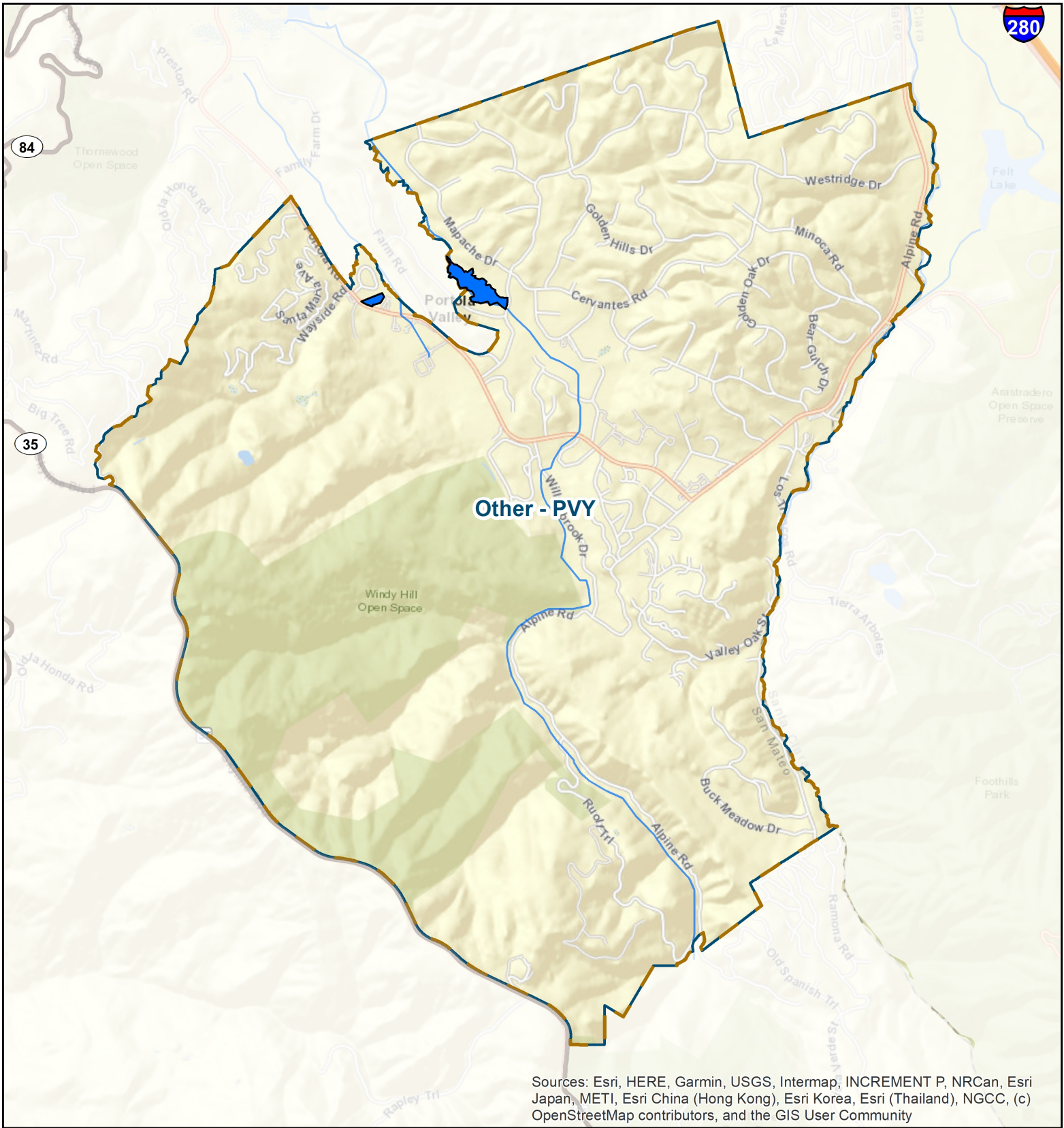
Millbrae Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022





Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

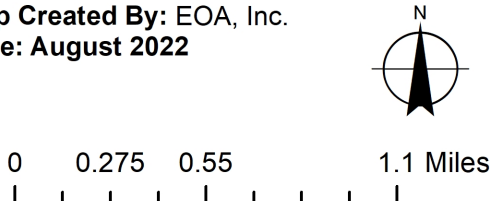
Figure A-12. WMAs and GI/LID in Portola Valley

Portola Valley Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022



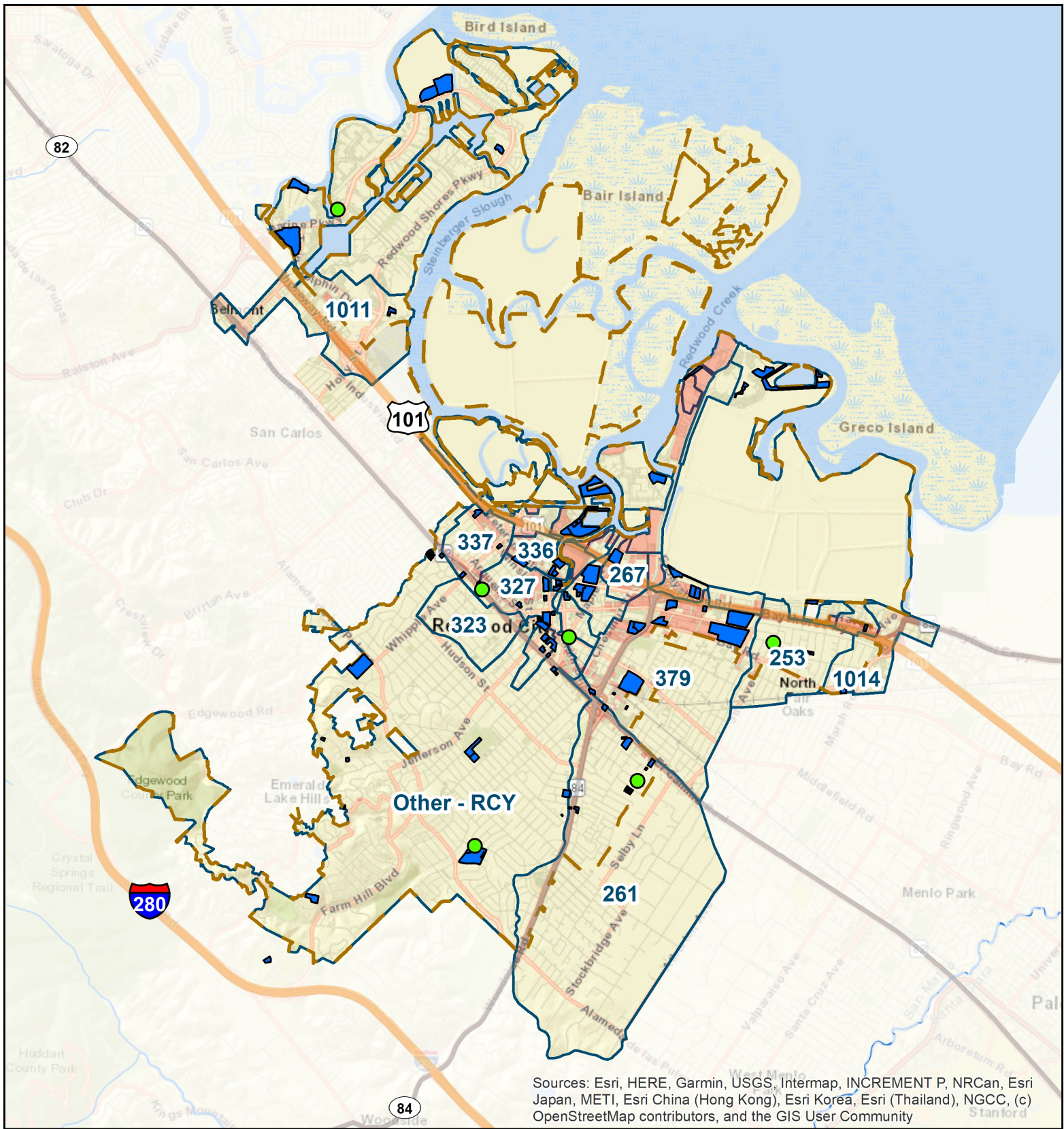


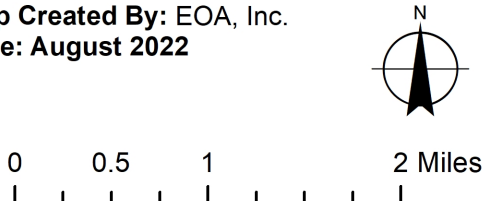
Figure A-13. WMAs and GI/LID in Redwood City

Redwood City Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022



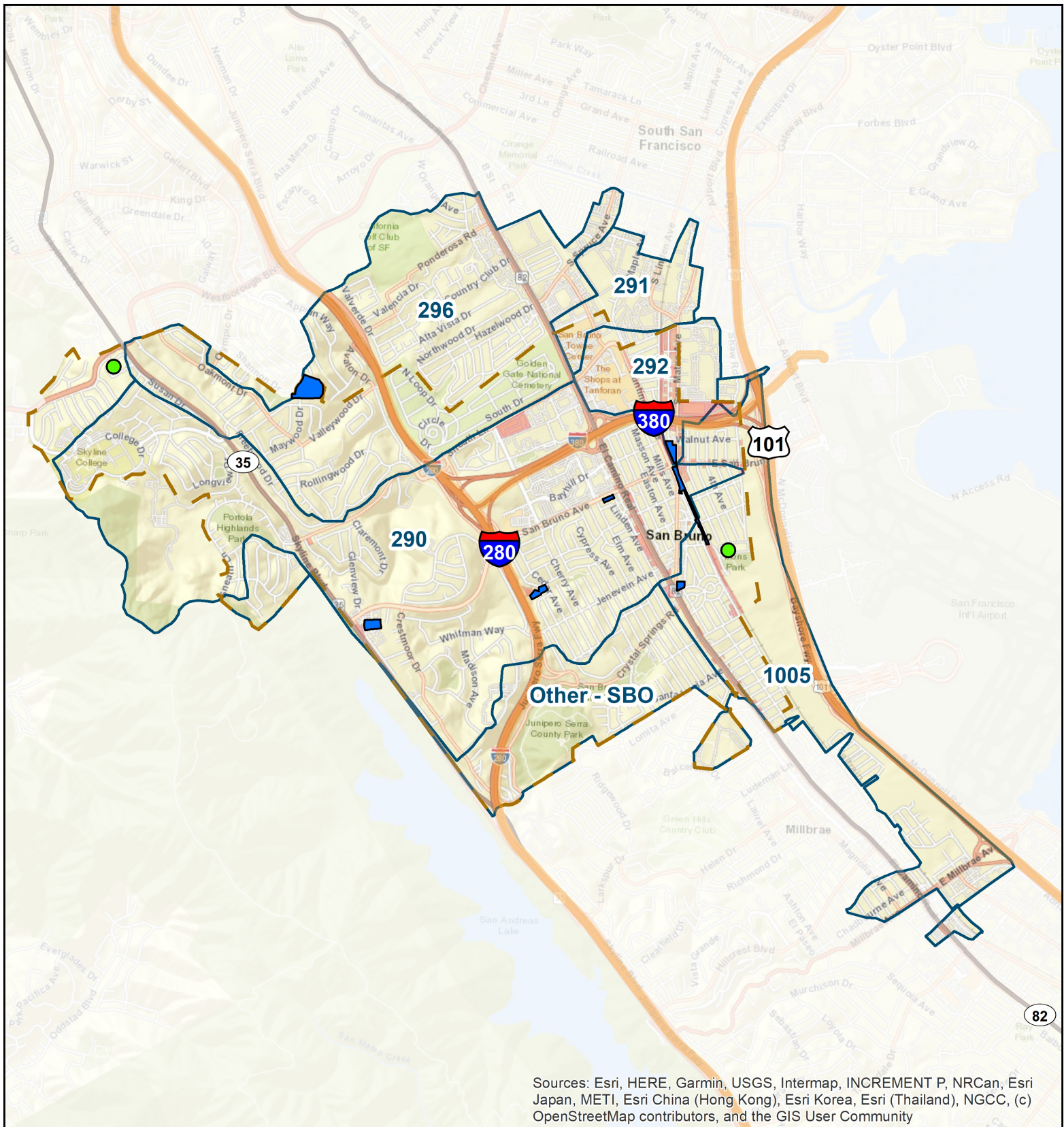


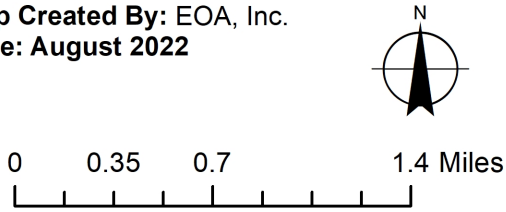
Figure A-14. WMAs and GI/LID in San Bruno

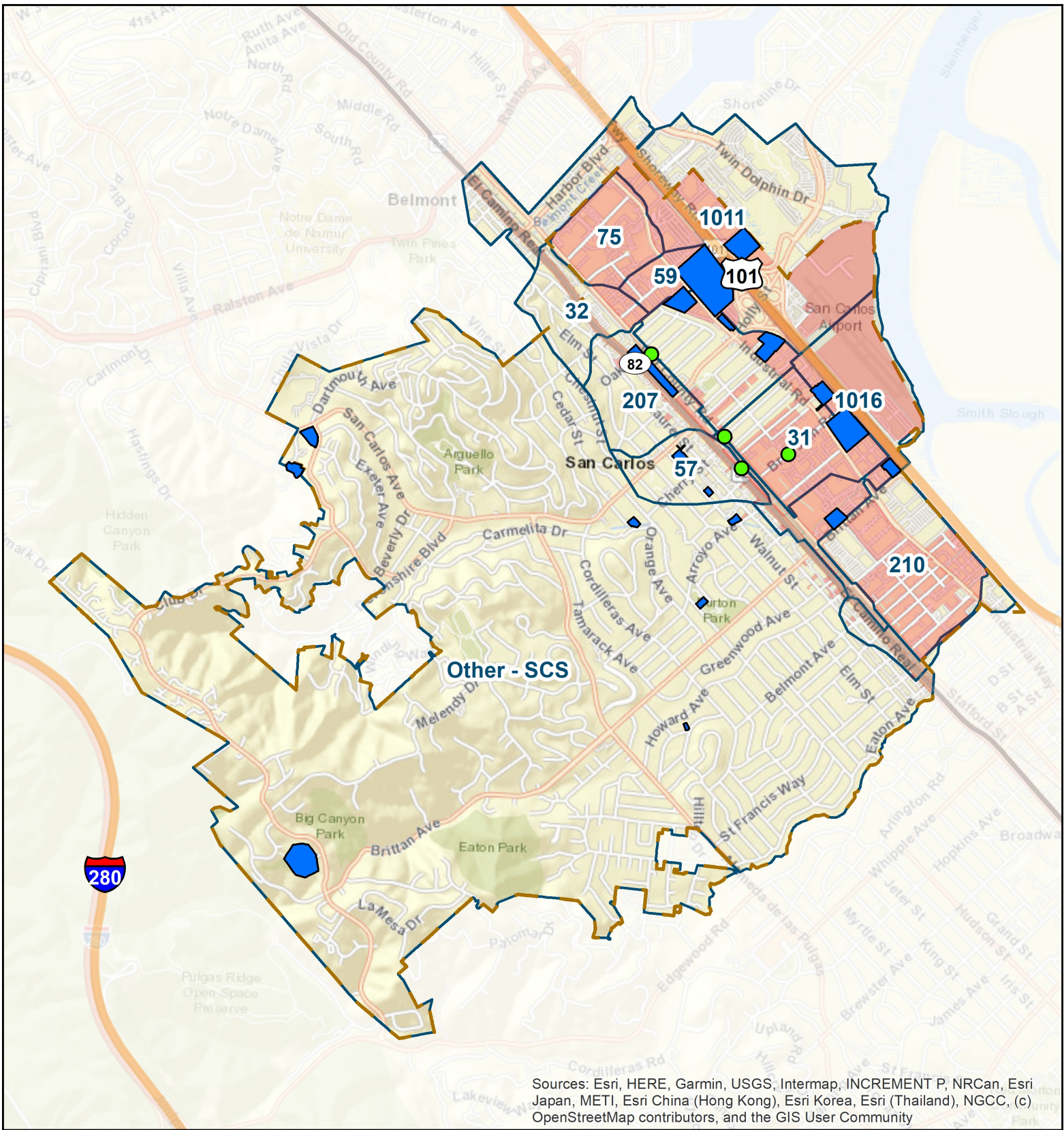
San Bruno Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022





Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

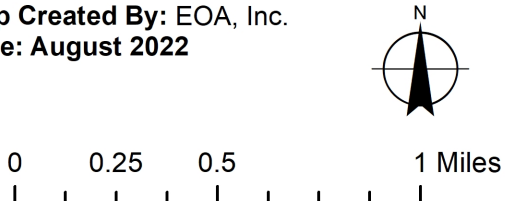
Figure A-15. WMAs and GI/LID in San Carlos

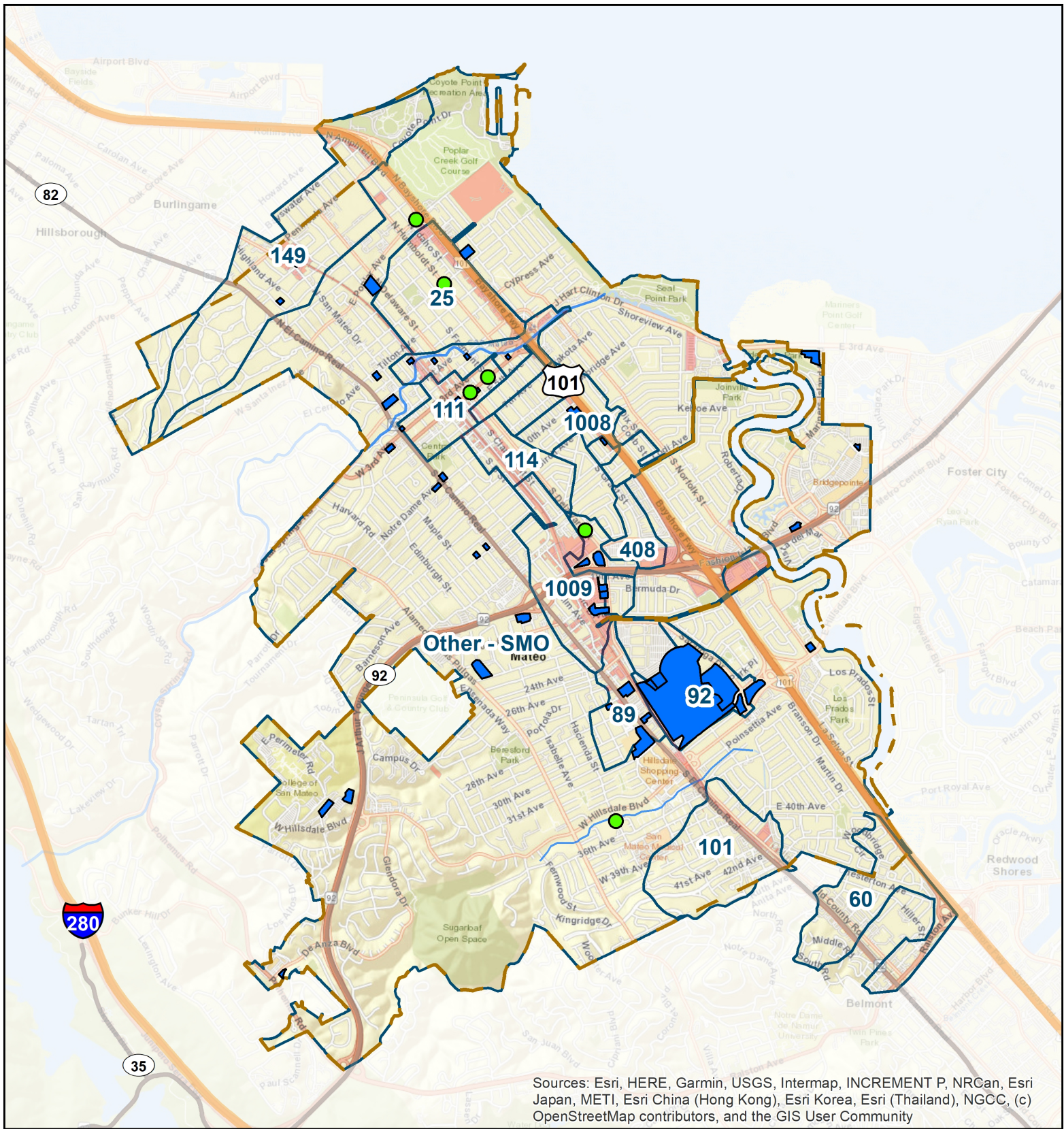
San Carlos Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022





Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

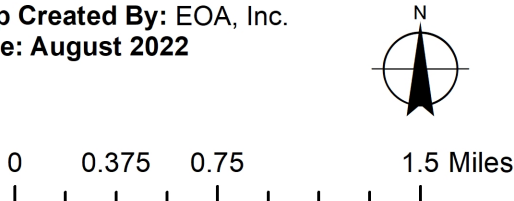
Figure A-16. WMAs and GI/LID in San Mateo City

San Mateo City Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022



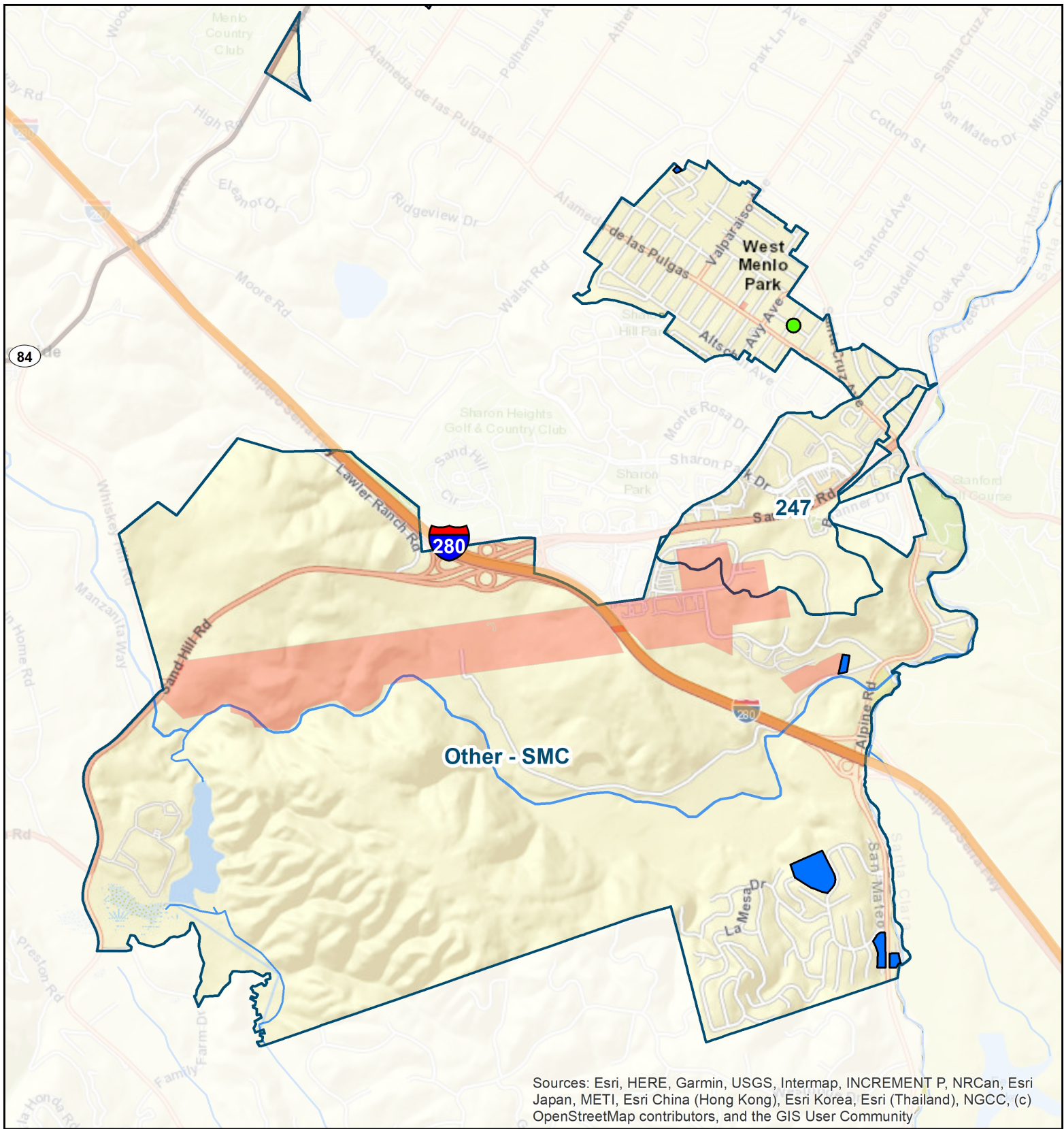


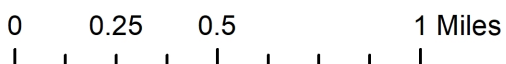
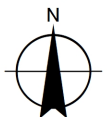
Figure A-17a. WMAs and GI/LID in Unincorporated San Mateo County

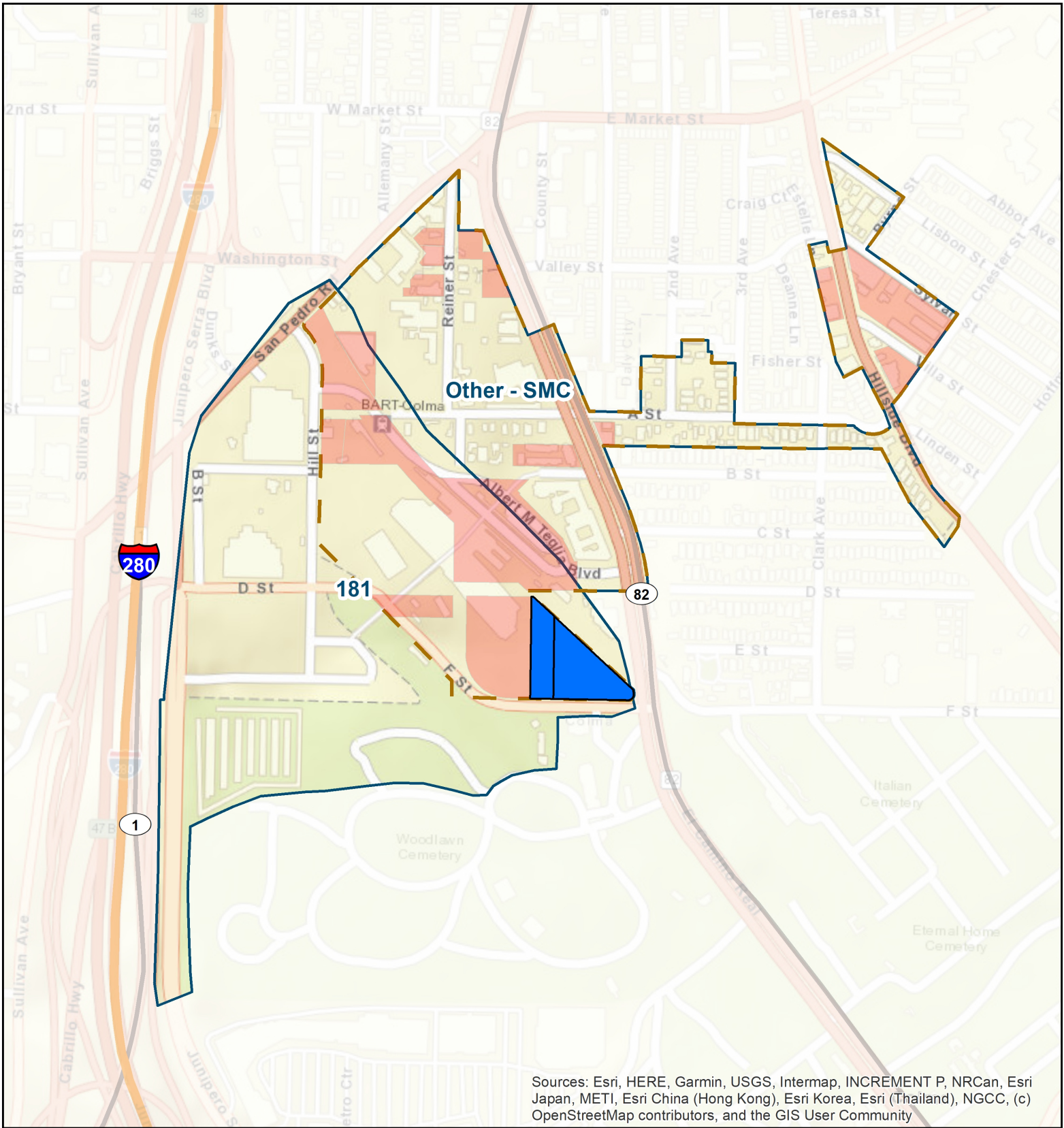
San Mateo County Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022





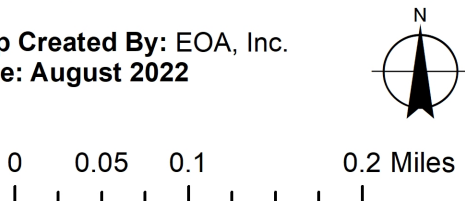
Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

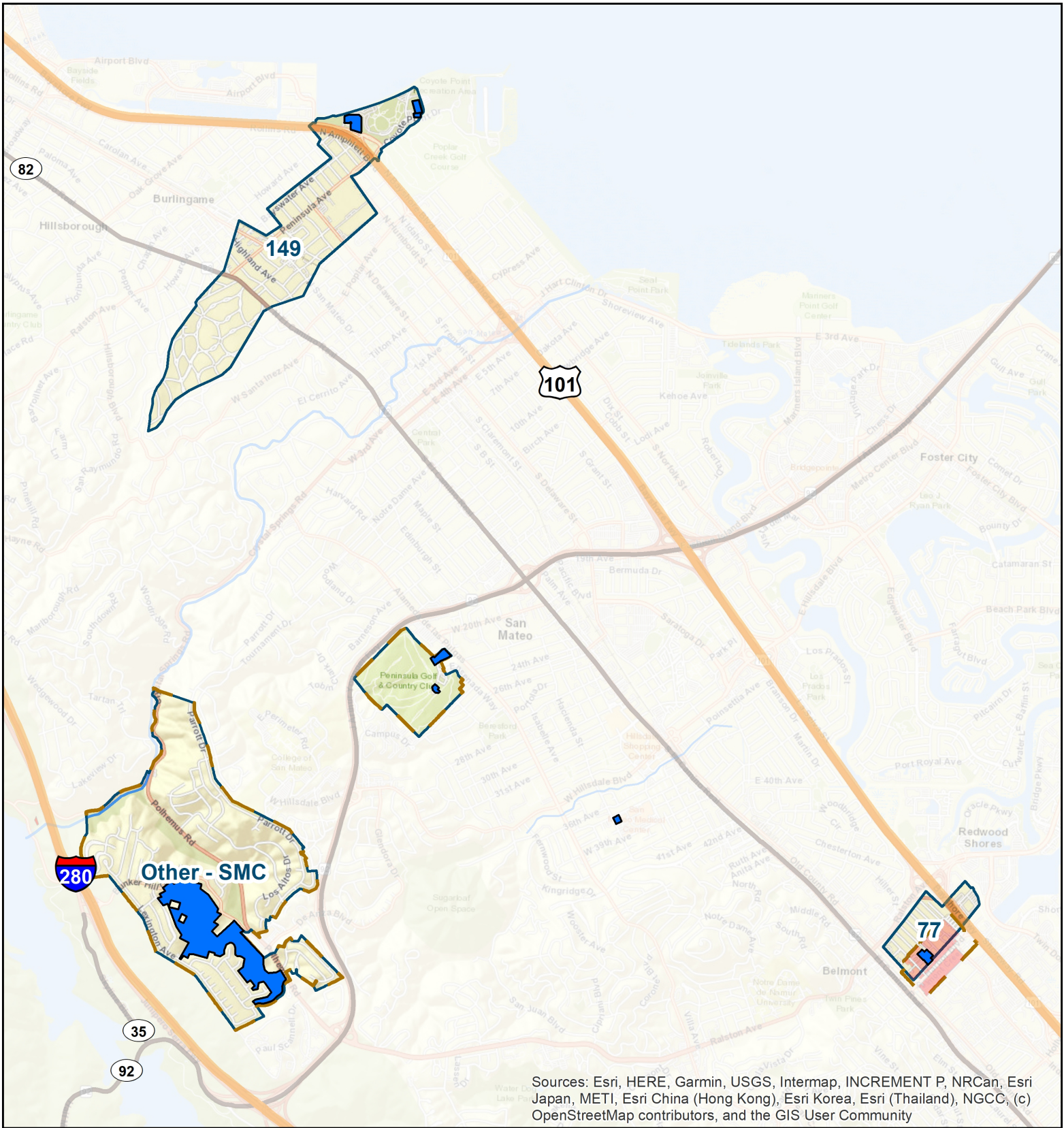
Figure A-17b. WMAs and GI/LID in Unincorporated San Mateo County

San Mateo County Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map
Map Created By: EOA, Inc.
Date: August 2022





Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

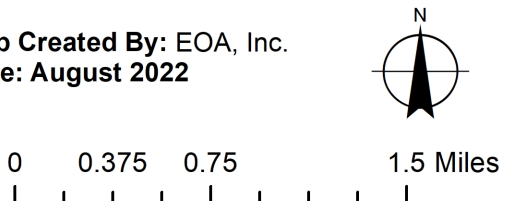
Figure A-17c. WMAs and GI/LID in Unincorporated San Mateo County

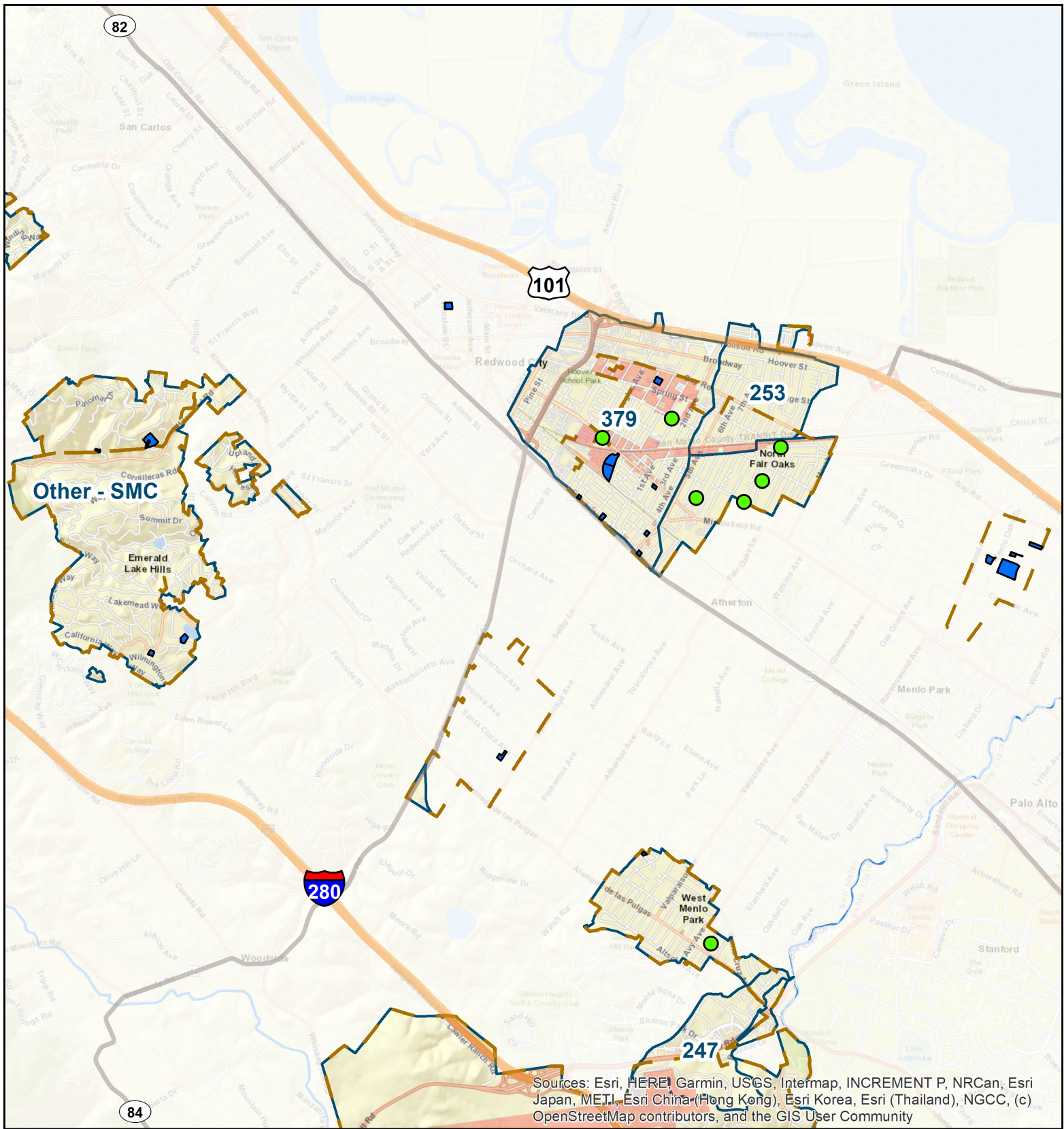
San Mateo County Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Permittee Boundary
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022





Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

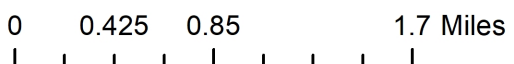
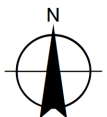
Figure A-17d. WMAs and GI/LID in Unincorporated San Mateo County

San Mateo County Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022



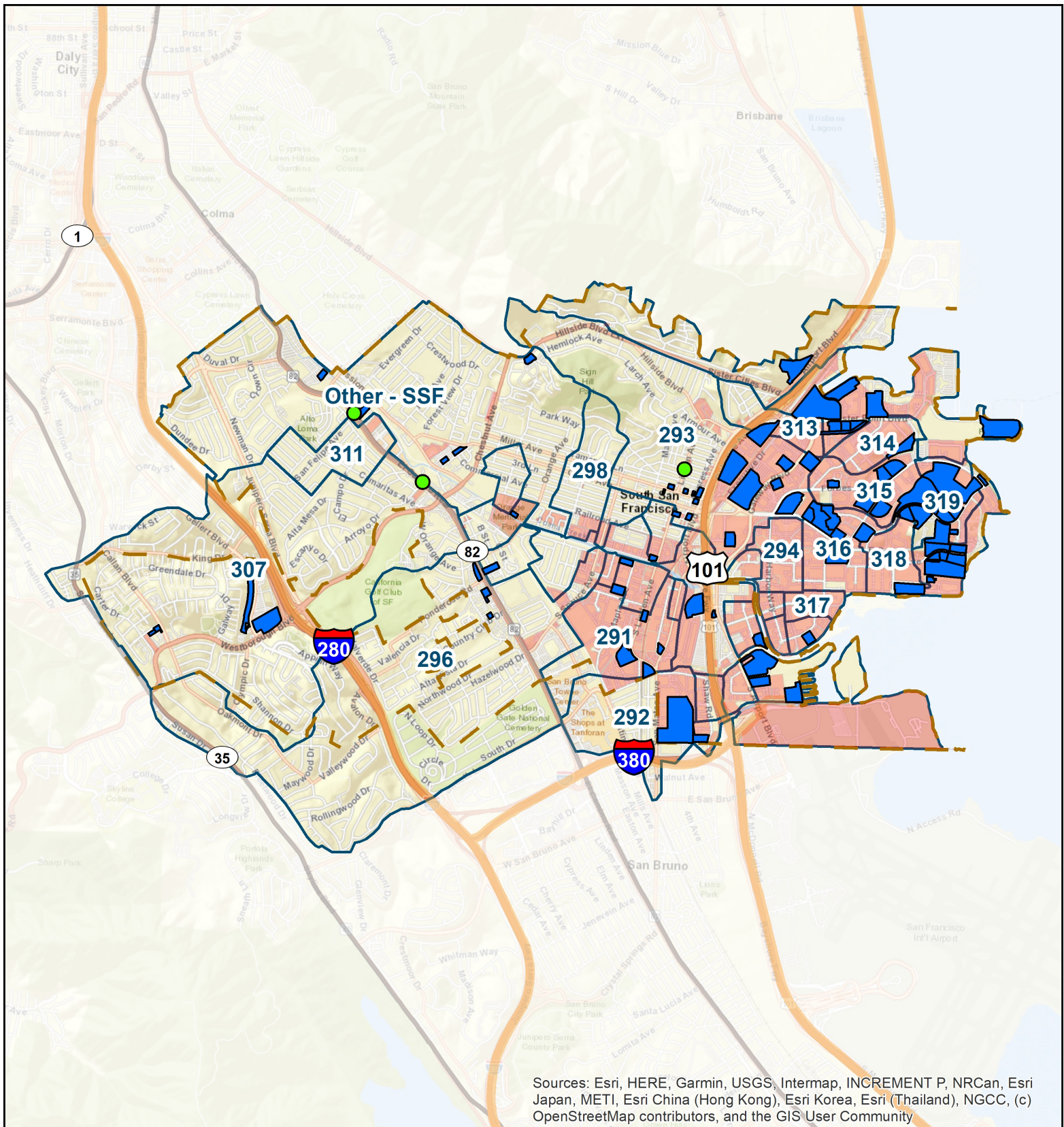


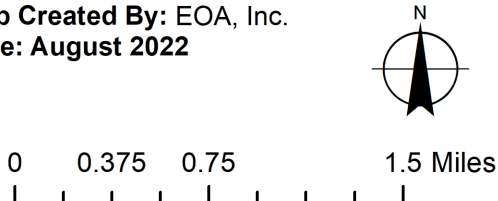
Figure A-18. WMAs and GI/LID in South San Francisco

South San Francisco Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022



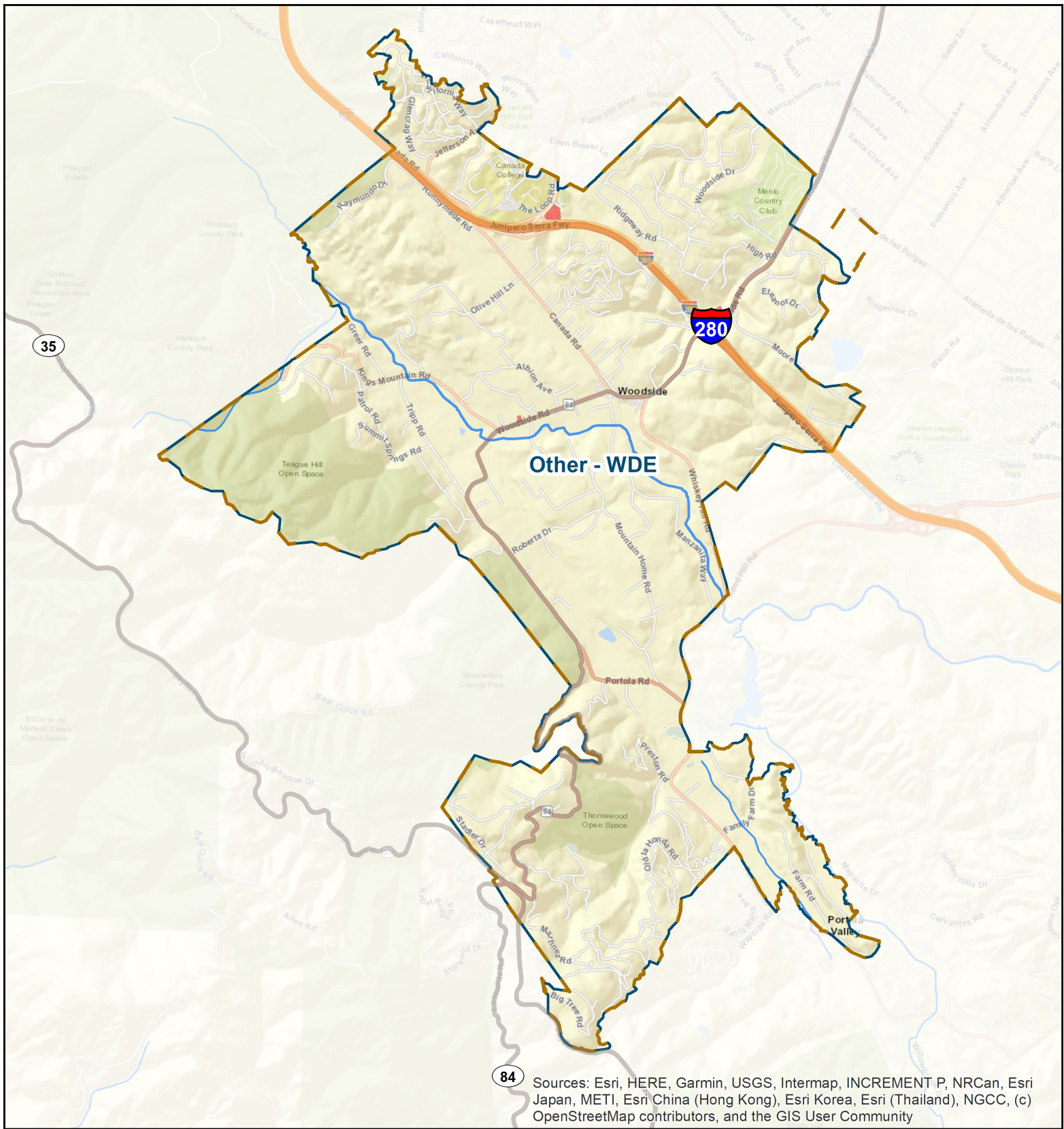


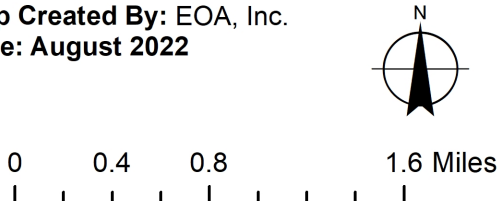
Figure A-19. WMAs and GI/LID in Woodside

Woodside Watershed Management Area Map

- Green Street Project
- Old Industrial Land Use
- Permittee Boundary
- GI/LID in Parcel-based New and Redevelopment Projects (Parcel Area)
- Watershed Management Area (WMA)

Data Sources:
City Boundaries: San Mateo County
Catchment Boundaries: Mattern/WLA
Background: ESRI World Street Map

Map Created By: EOA, Inc.
Date: August 2022



Sources: Esri, HERE, Garmin, USGS, Intermap, INCREMENT P, NRCan, Esri Japan, METI, Esri China (Hong Kong), Esri Korea, Esri (Thailand), NGCC, (c) OpenStreetMap contributors, and the GIS User Community

Appendix B

Descriptions of Land Uses Referenced in this Report

Descriptions of Land Uses Referenced in this Report

Old industrial: Area developed as an industrial land use before 1980 and not redeveloped before 2002, including railroads.

Old urban: Area developed before 1980 as any land use other than industrial or airport.

New urban: Area developed or redeveloped after 1980.

Open space: Area that is not developed or mostly pervious including large urban parks, channels, golf courses, and cemeteries.

Other: Airports.

Appendix 12

- Program for Management of PCBs during Building Demolition – Data Summary through FY 2021/22 for San Mateo County MRP Permittees

September 30, 2022

To: SMCWPPP NPDES Technical Advisory Committee and Representatives of Municipal Programs to Manage PCBs During Building Demolition

From: SMCWPPP Program Staff

Subject: Program for Management of PCBs during Building Demolition – Data Summary through FY 2021/22 for San Mateo County MRP Permittees

Background

Provision C.12.f. of the Municipal Regional Permit (MRP; Order No. R2-2015-0049) requires Permittees to manage PCBs-containing materials and wastes during building demolition activities. San Mateo County and other MRP Permittees have developed and implemented a program for managing materials with PCBs concentrations of 50 ppm or greater in applicable structures at the time applicable structures undergo demolition. Applicable structures are defined as buildings constructed or remodeled between the years 1950 and 1980 that are undergoing full-building demolition. Single-family residential and wood frame structures are exempt.

This technical memorandum documents the following items for San Mateo County MRP Permittees per the requirements in MRP Provision C.12.f.iii.(4):

- The number of demolition permits for applicable structures applied for during FY 2020/21, the reporting year and the second year of the program (data from FY 2019/20, the first year of the program, are also included); and
- A running list of the applicable structures that applied for a demolition permit (since July 1, 2019, the date the PCBs control program began implementation) that had material(s) with PCBs at 50 ppm or greater, with the address, estimated demolition date, and brief description of PCBs control method(s) used.

This memorandum was developed by SMCWPPP Program Staff on behalf of San Mateo County MRP Permittees. It will be included with the Program's FY 2021/22 Annual Report.

Number of Applicable Structure Applications

Table 1 summarizes the number of demolition permits for Applicable Structures applied for during FYs 2019/20, 2020/21, and 2021/22 by each Permittee and the number of associated samples with PCBs concentrations equal to or greater than 50 ppm.

List of Applicable Structures

Table 2 provides a running list of the Applicable Structures for which a demolition permit application was submitted since July 1, 2019 that had materials with PCBs concentrations of 50 ppm or greater. For each Applicable Structure, the address, estimated demolition date, number of samples with PCBs concentrations of 50 ppm or greater, and the range of PCBs concentrations in those samples are included.

Table 1: Number of Applicable Structure Applications Received in FYs 2019/20, 2020/21, and 2021/22.

Permittee	Number of Applicable Structures			Number of Samples with PCBs ≥ 50 ppm		
	FY 2019/20	FY 2020/21	FY 2021/22	FY 2019/20	FY 2020/21	FY 2021/22
Atherton	0	0	0	0	0	0
Belmont	0	0	0	0	0	0
Brisbane	0	0	0	0	0	0
Burlingame	1	2	1	0	0	0
Colma	0	0	0	0	0	0
Daly City	0	0	0	0	0	0
East Palo Alto	0	0	0	0	0	0
Foster City	0	0	0	0	0	0
Half Moon Bay	0	0	0	0	0	0
Hillsborough	0	0	0	0	0	0
Menlo Park	1	2	9	1	0	2
Millbrae	0	0	0	0	0	0
Pacifica	0	0	2	0	0	0
Portola Valley	0	0	0	0	0	0
Redwood City	1	3	2	0	13	0
San Bruno	0	0	0	0	0	0
San Carlos	1	2	0	0	16	0
San Mateo	0	2	0	0	0	0
South San Francisco	6	7	14	1	0	9
Woodside	1	1	0	0	0	0
San Mateo County	1	0	0	0	0	0
Total	12	19	28	2	29	11

Description of PCBs Control Method

Permittee Control Method

On behalf of all MRP Permittees, BASMAA conducted a Regional Project that developed an implementation framework, guidance materials, and tools for local agencies to ensure that PCBs-containing materials and wastes are properly managed during building demolition. The Regional Project also provided training materials and a workshop for municipal staff and an outreach workshop for the industry on implementing the framework/protocols developed via the project.

San Mateo County Permittees have implemented the following process for this control measure:

- The municipality informs applicable demolition permit applicants that their projects are subject to the program for managing materials with PCBs, necessitating, at a minimum, an initial screening for priority PCBs-containing materials.

- For every applicable demolition project, applicants implement the BASMAA protocol for identifying building materials with PCBs concentrations of 50 ppm or greater and then complete and submit a version of BASMAA’s model “PCBs Screening Assessment Form” (Screening Form) or equivalent to the municipality.
- The municipality reviews the Screening Form to make sure it is filled out correctly and is complete and works with the applicant to correct any deficiencies.
- The municipality then issues the demolition permit or equivalent, according to its procedures.
- The municipality sends each completed Screening Form for applicable structures and any supporting documents to Program Staff. Program staff compiles the forms and works with the other MRP countywide programs to manage and evaluate the data, and to assist Permittees with associated MRP reporting requirements.

Building Demolition Applicant Control Method

Applicants that determine, through implementation of the BASMAA protocol, that PCBs exist in priority building materials must follow applicable federal and state laws for handling and disposal. This may include reporting to U.S. Environmental Protection Agency (USEPA), the San Francisco Bay Regional Water Quality Control Board, and the California Department of Toxic Substances Control (DTSC). These agencies may require additional sampling and abatement of PCBs.

Depending on the approach for sampling and removing building materials containing PCBs, the applicant may need to notify or seek advance approval from USEPA before building demolition. Even in circumstances where advance notification to or approval from USEPA is not required before the demolition activity, the disposal of PCBs waste is regulated under Toxic Substances Control Act (TSCA). For example, TSCA requires manifesting the waste for transportation and disposal. (See 40 Code of Federal Regulations (CFR) 761 and 40 CFR 761, Subpart K.) TSCA-regulated does not equate solely to materials containing PCBs at or above 50 ppm. There are circumstances in which materials containing PCBs below 50 ppm are subject to regulation under TSCA. (See 40 CFR 761.61(a)(5)(i)(B)(2)(ii).) 40 CFR 761.3 provides information relative to disposal of PCBs-containing building materials, including definitions of PCBs bulk product wastes and PCBs remediation wastes. Further information is provided in a memorandum “PCB Bulk Product Waste Reinterpretation” from the Office of Resource Conservation and Recovery, EPA¹.

Additionally, the disposal of PCBs waste is subject to California Code of Regulations (CCR) California Code of Regulations (CCR) Title 22, Section Division 4.5, Chapter 12, Standards Applicable to Hazardous Waste Generators.

¹ Located here: https://www.epa.gov/sites/production/files/2016-01/documents/wste-memo_102412.pdf.

SMCWPPP FY 2021/22 Program for Management of PCBs during Demolition – Data Summary

Table 2. List of Applicable Structures with PCBs ≥ 50 ppm, FYs 2019/20, 2020/21, and 2021/22

Fiscal Year of Demolition Permit Application	Permittee	Building ID	Address	Estimated Demolition Date	Number of Samples with PCBs ≥ 50 ppm	PCBs Concentration Range (mg/kg)
FY 2019/20	Menlo Park	SM-2	305 Constitution Dr., Menlo Park, CA, 94025	Jan 2020	1	54.5
	South San Francisco	SM-6	1 Chestnut Ave., South San Francisco, CA, 94080	Jan 2020	1	247
FY 2020/21	San Carlos	SM-17	1075 Commercial St./915 Old County Rd., Redwood City, CA, 94070	Mar 2021	16	52 – 250,000
	Redwood City	SM-28	975 Maple St., Redwood City, CA, 94063	Jul 2021	2	97 - 102
	Redwood City	SM-29	1150 Veterans Blvd., Redwood City, CA, 94063	Oct 2021	11	50 – 330,000
FY 2021/22	Menlo Park	SM-40	1390 Willow Road (MPK 50)	Apr/May 2022	2	340 – 790
	South San Francisco	SM-58	466 Forbes Blvd., South San Francisco, CA, 94080	Aug 2022	5	57 – 130,000
	South San Francisco	SM-57	225 Spruce St., South San Francisco, CA, 94080	Fall 2022	4	580 – 25,000

Appendix 13

- FY 2021/22 Regional Supplement for New Development and Redevelopment, San Francisco Bay Area, Municipal Regional Stormwater Permit, Bay Area Municipal Stormwater Collaborative, September 2022.
- CASQA 2022 Pesticide Annual Report and Effectiveness Assessment Final Report, California Stormwater Quality Association, August 2022.
- CASQA FY 2021-22 Our Water Our World (OWOW) Report, California Stormwater Quality Association, September 2022.

Annual Reporting for FY 2021-2022

**Regional Supplement for
New Development and Redevelopment**

**San Francisco Bay Area
Municipal Regional Stormwater Permit**

**Bay Area Municipal Stormwater
Collaborative**

September 2022

**MRP Regional Supplement for New Development and Redevelopment
Annual Reporting for FY 2021-2022**

TABLE OF CONTENTS

INTRODUCTION	2
GREEN INFRASTRUCTURE PLANNING AND IMPLEMENTATION	2
C.3.j.iii Participation in Processes to Promote Green Infrastructure	2
Activities and Accomplishments during FY 21-22	3
MRP 3.0 C.3/GI Work Group	3
San Francisco Estuary Blueprint 2022 Update	3
BAMSC Development Subcommittee	3
Other Participation and Comments	4

LIST OF ATTACHMENTS

C.3.j.iii Participation in Processes to Promote Green Infrastructure

1. San Francisco Estuary Blueprint 2022 – Action 19, Stormwater Management
2. Green Infrastructure Leadership Exchange – Climate Resilience Resources Guide: Part 1, August 2022

MRP Regional Supplement for New Development and Redevelopment Annual Reporting for FY 2021-2022

INTRODUCTION

This Regional Supplement has been prepared to report on regionally implemented activities complying with portions of the Municipal Regional Stormwater Permit (MRP), issued to 79 municipalities and special districts (Permittees) by the San Francisco Bay Regional Water Quality Control Board (Water Board). The Regional Supplement covers new development and redevelopment activities related to the following MRP 2.0 provision:

- C.3.j.iii. Participate in Processes to Promote Green Infrastructure.

These regionally implemented activities were conducted under the auspices of the Bay Area Municipal Stormwater Collaborative (BAMSC), an informal coalition of the municipal stormwater programs in the San Francisco Bay Area.¹ Most of the 2021-22 annual reporting requirements of Provision C.3.j.iv covered in this Supplement were completely met by BAMSC member activities, except where otherwise noted herein or by Permittees in their reports. MRP Permittees, through their program representatives on the BAMSC Steering Committee and its Subcommittees, collaboratively participated in these BAMSC informal regional activities.

GREEN INFRASTRUCTURE PLANNING AND IMPLEMENTATION

C.3.j.iii. Participation in Processes to Promote Green Infrastructure

This provision requires:

(1) The Permittees shall, individually or collectively, track processes, assemble and submit information, and provide informational materials and presentations as needed to assist relevant regional, State, and federal agencies to plan, design, and fund incorporation of green infrastructure measures into local infrastructure projects, including transportation projects. Issues to be addressed include coordinating the timing of funding from different sources, changes to standard designs and design criteria, ranking and prioritizing projects for funding, and implementation of cooperative in-lieu programs.

This section describes activities and accomplishments during FY 21-22 to promote green infrastructure (GI or GSI). The BAMSC activities described in this section provide compliance for MRP Permittees with this provision.

¹ In late FY 20-21, the predecessor to BAMSC, the Bay Area Stormwater Management Agencies Association (BASMAA), dissolved as a formal non-profit organization and its members continued to meet as an informal organization under the name Bay Area Municipal Stormwater Coalition (BAMSC). BAMSC members jointly prepared this Regional Supplement for FY 21-22.

MRP Regional Supplement for New Development and Redevelopment Annual Reporting for FY 2021-2022

Activities and Accomplishments during FY 21-22

MRP 3.0 C.3/GI Work Group

Countywide Program and Permittee staff actively participated in the BAMSC MRP 3.0 C3/GI Work Group to discuss, internally and with Water Board staff, issues to be addressed in Provision C.3 of MRP 3.0, including requirements for long-term and short-term implementation of GI. The Work Group proposed an approach for setting short-term requirements in the context of long-term GI implementation goals that would be established via a Technical Working Group (TWG) including Water Board staff and outside science experts from EPA, SFEP, SFEI, and other organizations. The TWG will begin meeting in FY 22-23 to discuss long-term goals for GI and reductions in impervious surfaces at individual, countywide and regional scales.

In FY 21-22, the C.3/GI Work Group met once with Water Board staff to discuss the MRP 3.0 Revised Tentative Order, in addition to holding several internal meetings and conducting some smaller group meetings with Water Board staff on focused topics. Key issues discussed included: regulated project thresholds; regulation of single-family homes; regulation of road maintenance and reconstruction projects; alternative compliance options, Special Projects provisions, asset management, and future GI requirements. At the May 11, 2022 Regional Water Board Adoption Hearing for MRP 3.0, the current Co-Chair of the BAMSC, Reid Bogert, presented testimony to the Regional Water Board members and hearing participants, focusing on the impacts of proposed C.3 provisions of the reissued permit and proposed strategies for improving implementation outcomes.

San Francisco Estuary Blueprint 2022 Update

The San Francisco Estuary Partnership's (SFEP's) *San Francisco Estuary Blueprint* (Blueprint), formerly known as the Comprehensive Conservation and Management Plan, is a living collaborative agreement, updated every five years, about what should be done to protect and restore the Estuary. The 2022 update of the 2016 Blueprint focused on revisions at the specific action and task levels. Action 19 and Tasks 19-1, 19-2, and 19-3 address management of stormwater with low impact development and GSI. BAMSC members worked with Josh Bradt of the SFEP to provide input on task descriptions and ways that BAMSC would be a collaborative partner in implementing these tasks. The stormwater management (Action 19) section of the final 2022 Blueprint is provided as Attachment 1.

BAMSC Development Subcommittee

The BAMSC Development Subcommittee continued to meet approximately quarterly during FY 21-22 and promoted implementation of GI by providing a forum to discuss the following topics:

- GI operation and maintenance (O&M), including the City of San Jose's GSI O&M Manual;
- Compost and mulch practices, including a new biotreatment area wood mulch specification;
- Bioretention vegetation selection and maintenance, including SCVURPPP's GSI Vegetation Guide and Contra Costa County's drought-tolerant plant list;

MRP Regional Supplement for New Development and Redevelopment Annual Reporting for FY 2021-2022

- Case studies of rain water harvesting and rain garden rebate programs implemented throughout the region, including in San Mateo County, the City of Cupertino and Valley Water.

The Development Subcommittee's Biotreatment Soil Media (BSM)-Tree-Design Work Group also met once during FY 21-22 and discussed trees in bioretention, tree well filter designs, and the bioretention wood mulch specification. The Santa Clara Valley Urban Forestry Alliance is a new organization that is now participating in this work group.

Other Participation and Comments

- Green Streets for Sustainable Communities Symposium and Work Group – In the fall of 2020, Jill Bicknell and Vishakha Atre (EOA, representing SCVURPPP) and Matt Fabry (C/CAG) worked with the organization Transportation Choices for Sustainable Communities (TCSC) to plan and conduct a "Green Streets for Sustainable Communities" Symposium. The purpose of the symposium was to bring together elected officials, city staff leaders, stormwater experts, complete street/transportation experts, environmental activists, tree and urban ecology experts, and other stakeholders to explore how to better fund, design, build, manage and maintain streets to optimize performance for people and nature. Details and presentation videos can be found on the [TCSC website](#). Following the symposium, SCVURPPP staff participated in meetings of the TCSC Green Streets Work Group during FY 20-21 and FY 21-22. The Work Group worked on follow-up actions to the Symposium, such as: 1) development of draft language for Sustainable Streets legislation; 2) meetings with State legislators and City Council members to promote sustainable streets; and 3) development of a presentation to elected officials on the need for and benefits of sustainable streets.
- Reid Bogert (SMCWPPP) – Presentation at the Silicon Valley Bicycle Coalition Annual Bike Summit on August 13, 2021 on the San Mateo Countywide Sustainable Streets Master Plan outcomes: "Tooling Up Sustainable Streets in San Mateo County".
- Reid Bogert (SMCWPPP) – Presentation at 2021 CASQA Conference: "Calm Before the Storm: San Mateo County Sustainable Streets Master Plan". Project received 2021 CASQA Award for Outstanding Sustainable Stormwater Project or Program.
- Reid Bogert (SMCWPPP) – Moderated panel at 2021 CASQA Conference on "Advancing Collaborative Approaches to Regional-Scale Stormwater Management" – the Regional Collaborative Program Framework White Paper developed under this grant funded project focused on evaluating countywide opportunities for regional-scale multi-benefit stormwater capture projects and regional programmatic implementation of distributed GI, establishing the business case for a regional collaborative approach, advancing innovative funding and financing, and developing additional concept designs for high performing regional projects.

MRP Regional Supplement for New Development and Redevelopment Annual Reporting for FY 2021-2022

- Reid Bogert (SMCWPPP) – Participated in a panel at the 2021 CASQA Conference on “Co-funding Stormwater Incentives Through ‘Stacked Incentives’”.
- Reid Bogert (SMCWPPP) – Presentation at the February California Stormwater Quality Association Funding Subcommittee on “Advancing Regional-Scale Stormwater Management in San Mateo County CASQA Funding Subcommittee” including an emphasis on advancing planning and funding for multi-benefit, regional-scale stormwater projects.
- Reid Bogert (SMCWPPP) – Presentation at the Bay Area Water Supply Conservation Agency’s Water Supply Reliability Roundtable in June, focusing on the “Advancing Regional Scale Stormwater Management in San Mateo County” project and identifying opportunities and barriers for integrated water planning (i.e., One Water) strategies in the Bay Area.
- Reid Bogert (SMCWPPP) – Project manager for Climate Resiliency Resources Guide for GI Leadership Exchange. This Collaborative Grant Program project under the GI Leadership Exchange developed a comprehensive North American scale guide focused on creating resources for integrating climate adaptation into municipal GI programming and project implementation with detailed considerations and next step recommendations for advancing this work in the areas of policy, planning, design and operations and maintenance.
- Reid Bogert (SMCWPPP) – Discussions with state legislators and staff on the development of the proposed 2022-23 Drought and Resilience Appropriations Legislation to request specific categories of funding for green stormwater infrastructure and reduced matching requirements for implementing grant programs.

Attachments

Attachment 1
San Francisco Estuary Blueprint 2022
Action 19, Stormwater Management

ACTION
19
STORMWATER
MANAGEMENT

Manage stormwater with low impact development and green stormwater infrastructure.

Implement Low Impact Development (LID) and Green Stormwater Infrastructure (GSI) to reduce polluted stormwater to the Estuary. Develop planning and tracking tools, technical materials, policy recommendations, and financing strategy guidance to aid agencies with implementation.

TASK 19-1

Expand funding opportunities for Green Stormwater Infrastructure (GSI) planning and implementation, including those identified in the [Roadmap of Funding Solutions for Sustainable Streets](#). Expand effort to engage utility agencies that also maintain infrastructure in the public realm to increase collaboration and cooperation.

MILESTONE

10 stormwater management/transportation planning meetings with Metropolitan Transportation Commission, San Francisco Bay Regional Water Quality Control Board, and others.

COST ESTIMATE – \$

TASK 19-4

Develop a stormwater asset management module within the Metropolitan Transportation Commission's StreetSaver Program to help Bay Area municipal jurisdictions improve inventory, inspection, and maintenance of storm drain and green infrastructure assets along streets.

MILESTONE

Revised StreetSaver Program that includes a stormwater asset management module consistent with requirements in stormwater permits.

COST ESTIMATE – \$\$

TASK 19-2

Improve the San Francisco Bay Low Impact Development (LID) Tracker Tool and the process to efficiently receive pertinent GSI project information reported to the San Francisco Bay Regional Water Quality Control Board to increase the number of projects in the Tracker Tool and allow reporting on the cumulative pollutant reduction effectiveness of GSI projects on the water quality of San Francisco Bay.

MILESTONE

A permanent agency home and budget for the LID Tracker Tool with budget for coordination with municipalities and countywide clean water programs, project data compilation and entry, and ongoing software maintenance.

COST ESTIMATE – \$\$



Photo: Lonny Meyer

GOALS

Living Resources

Resilience

Water

Stewardship

TASK 19-3

Pilot an alternative or in-lieu LID compliance Compliance program for San Francisco Bay Regional Water Quality Control Board that demonstrates to municipalities a programmatic approach to alternative compliance that can provide funding for both capital implementation and long-term operations of multi-benefit Green Stormwater Infrastructure, and result in projects that provide a net environmental benefit or equivalent or increased water quality benefit.

MILESTONE

San Francisco Bay Regional Water Quality Control Board-approved alternative compliance pilot program with two public projects identified for receiving resources from regulated project proponents.

COST ESTIMATE – \$\$\$

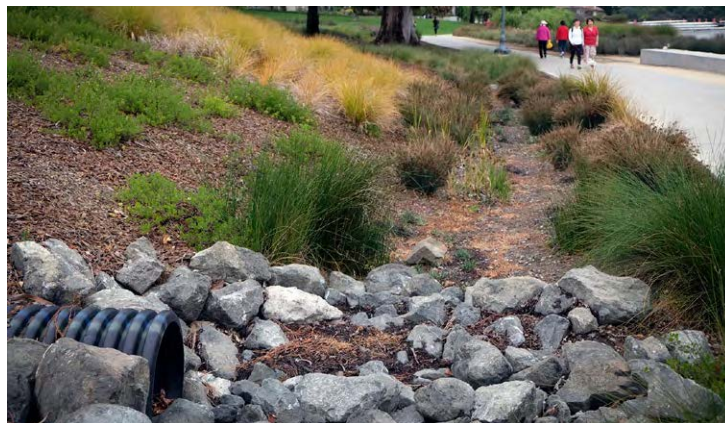


Photo: Jennifer Krebs

Overview

In cities around the region, impervious surfaces such as streets and sidewalks typically represent 15-25 percent of land cover. Impervious surfaces prevent stormwater from being filtered through the soil, resulting in stormwater runoff that carries pollutants like oil, grease, pesticides, and heavy metals down drains and straight into the Estuary. As climate change brings more extreme weather events to the Estuary, green stormwater infrastructure (GSI) and low impact development (LID) installations can reduce runoff volumes and distribute runoff into inlets across a longer period of time, helping to reduce the impacts of urbanization on local hydrology and water quality.

Updates and Emerging Issues

Since 2016, this Action's focus has shifted from planning to implementation, with projects being tracked regionally via an LID Tracker Tool, built by the San Francisco Estuary Institute to be compatible with other GIS-based software programs. Additionally, this Action now explores creative ways to fund stormwater infrastructure projects, such as an in-lieu alternative compliance pilot program that would allow cities to get GSI funding from private projects where on-site treatment is infeasible. While the action is focused on the Estuary due to San Francisco Bay Regional Water Quality Control Board requirements and intense urbanization, LID/GSI is an effective strategy in Delta watersheds as well.

Climate Change Considerations

Climate change will bring more extreme weather events to the Estuary, causing periods of drought and periods of intense precipitation. GSI/LID installations can distribute runoff into inlets over a longer period of time, helping reduce flooding caused by overwhelmed stormwater systems.

Equity Considerations

GI/LID techniques often improve community aesthetics and create more pedestrian friendly spaces, which are needed in many underserved communities. However, these projects can also raise property values and lead to green gentrification, further exacerbating displacement in communities already vulnerable to hot real estate markets.

Connections to Other Actions

The use of GSI/LID to prevent water pollution and flooding hazards closely connects this action with:

- A1: Climate Resilience**
- A2: Equity**
- A3: Adaptation Planning**
- A4: Adaptation Implementation**
- A18: Recycled Water**
- A20: Nutrients**
- A21: Emerging Contaminants**
- A22: Health Risks of Contaminants**

Cost Estimate Key	\$\$ - Up to \$1 million	\$\$\$\$ - Up to \$100 million
\$ - Up to \$100,000	\$\$\$ - Up to \$10 million	\$\$\$\$\$ - Over \$100 million

Attachments

Attachment 2

**Green Infrastructure Leadership Exchange
Climate Resilience Resources Guide: Part 1
August 2022**

Climate Resilience Resources Guide: Part 1

August 2022

Acknowledgments

The Green Infrastructure Leadership Exchange | Project Manager

Green Infrastructure Leadership Exchange ("the Exchange") strives to accelerate the affordable and equitable implementation of green stormwater infrastructure (GSI) throughout North America by supporting peer learning, innovation and collaboration among cities, counties, and utilities. We're a highly connected peer learning network that offers a platform for practitioners to share experiences, circulate ideas, and solve problems together toward finding more sustainable water infrastructure solutions. The Exchange is a project of the Global Philanthropy Partnership. For more, visit giexchange.org.

Geosyntec Consultants | Lead Author

Geosyntec Consultants is a highly respected, top-tier geo-environmental consulting and engineering firm that works closely with public and private sector clients to address complex environmental, natural resources, and civil infrastructure problems. Geosyntec has over 100 water and natural resources practitioners nationwide known for their innovative work in stormwater and surface water quality management; hydromodification management; Best Management Practice (BMP) selection, design, and optimization; and erosion and sediment control. Geosyntec provides a thorough understanding of technical, practical, and regulatory issues to support clients in making informed management decisions. For more, visit geosyntec.com

Statements and views expressed in this Guide are solely those of the authors and do not imply endorsement by the Global Philanthropy Partnership.

Project Team and Dedicated Reviews

Reid Bogert, City/County Association of Governments of San Mateo County | **Project Lead**
Adrienne Aiona, City of Portland
Tsega Anbessie, Philadelphia Water Department
Stephanie Chiorean, Philadelphia Water Department
Kimberly Grove, City of Baltimore
Willis Logsdon, San Francisco Public Utilities Commission
Ryan Quinn, Pittsburg Water and Sewer Authority
Sonja Vangjeli, Waterfront Toronto
Kasey Armstrong, Green Infrastructure Leadership Exchange

TABLE OF CONTENTS

1. INTRODUCTION	1
2. BACKGROUND	2
2.1 Stormwater Management Strategies.....	2
2.1.1 Green Stormwater Infrastructure	2
2.1.2 Grey Stormwater Infrastructure.....	4
2.1.3 Other Nature-Based Solutions	4
2.2 Climate Change Impacts	5
2.2.1 Regional Climate-Related Impacts	5
2.2.2 Climate-Related Vulnerabilities	9
2.3 GSI for Climate Resilience	11
2.3.1 Managing Urban Flooding	11
2.3.2 Preventing and Reducing Erosion.....	11
2.3.3 Reducing Urban Heat Impacts	12
2.3.4 Improving Air Quality	12
2.3.5 Water Supply Augmentation	12
2.3.6 Human Health Benefits.....	13
2.4 GSI and Equity.....	13
2.5 Public Engagement, Communication, and Outreach.....	16
2.6 Limitations of GSI.....	18
3. POLICY AND REGULATORY REQUIREMENTS.....	19
3.1 Policies and Regulations Concerning GSI and Climate Resilience	19
3.2 Incorporating Resilience into Policies and Regulations	20
3.3 Next Steps	22
4. GSI PLANNING	23
4.1 Considerations for GSI Planning Related to Climate Resilience.....	23
4.1.1 Potential Impacts of Climate Change on GSI Performance.....	24
4.1.2 Opportunities for GSI to Increase Community Resilience.....	25
4.2 Incorporating Climate Resilience into GSI Planning.....	26
4.3 Next Steps	28

5.	GSI DESIGN.....	30
5.1	Established Conceptual Model for GSI Siting, Sizing, and Design.....	30
5.1.1	Stormwater Facility Sizing.....	31
5.1.2	GSI Component Design.....	32
5.2	Considerations for GSI Related to Climate Resilience.....	33
5.2.1	Hydrologic Impacts: Precipitation Change and Early Snowmelt.....	33
5.2.2	Other Impacts: Temperature and Sea Level Rise	37
5.3	Incorporating Climate Resilience into GSI Sizing and Design.....	37
5.3.1	GSI Sizing	37
5.3.2	GSI Types	40
5.3.3	GSI Hydraulic Components.....	41
5.3.4	Media and Vegetation Considerations	41
5.3.5	Additional Considerations for CSO Communities	42
5.3.6	GSI Facility Retrofit.....	42
5.4	Next Steps	43
5.4.1	Quantifying the Potential Extent of Climate Impacts to GSI.....	43
5.4.2	Resilience of GSI Measures and Components.....	43
5.4.3	Methods to Develop New GSI Design Standards or Guidance	43
6.	GSI OPERATIONS AND MAINTENANCE.....	45
6.1	Considerations for GSI Operations and Maintenance Related to Climate Resilience.....	45
6.2	Incorporating Resilience into GSI O&M	46
6.2.1	Climate Change Education & Training.....	46
6.2.2	Adaptive Management.....	47
6.3	Next Steps	47
7.	CLIMATE RESILIENCE RESOURCES GUIDE ROAD MAP – SUGGESTED NEXT STEPS	
	48	
8.	SOURCES CITED	50

LIST OF TABLES

Table 1. Climatic Impact Drivers Relevant to GSI Policy, Planning, Design, and Operations and Maintenance	6
Table 2. Tools for Assessing Past and Future Climate Changes	9
Table 3. Equity in GSI Planning Resources.....	16
Table 4. Summary of IPCC Emission Scenarios (adapted from IPCC AR5, 2014)	39
Table 5. Prioritized Topics for Future Iterations of this Guide.....	49

LIST OF FIGURES

Figure 1. Projected change (increase or decrease) for selected climatic impact drivers in six regions in North America.	8
Figure 2. Example "Knee of the Curve" based on Historical Data	32
Figure 3. Altered "knee of the curve" sketch due to climate change impacts.....	34
Figure 4. Actual altered "knee of the curve" due to climate change impacts in Western Washington.	35
Figure 5. Map of the observed change in very heavy precipitation (defined as the top 1% of all daily events) from 1958 to 2012 in the U.S.	36
Figure 6. Projected global surface warming for different emissions scenarios	40

LIST OF APPENDICES

Appendix A: Matrix of Existing GSI Resilience Resources	
---	--

1. INTRODUCTION

This Climate Resilience Resources Guide (Guide) explores the intersection of green stormwater infrastructure (GSI) and urban impacts from climate change. GSI is a decentralized approach to stormwater management that mimics natural hydrology by slowing and/or retaining runoff generated from rainfall. Resilience-focused policy, planning, and implementation of GSI could make communities more resilient to climate change while providing human health benefits. However, existing planning, design, and maintenance standards for GSI might leave this infrastructure at risk of not performing per current stormwater regulations or being damaged because of the impacts of a changing climate. This Guide explores potential changes to current GSI policy, planning, and implementation practices that could enhance the climate resilience benefits provided by GSI and considers how climate change could negatively impact GSI performance.

The primary target audience for this Guide includes municipal staff, decision-makers, and regulatory entities. Recommendations in this Guide may also be helpful for community members and stakeholders to advocate, plan, implement, and maintain GSI.

This Guide examines decision-making processes for planning and implementing GSI based on climate resilience, public engagement, and equity considerations. The Guide references relevant resources throughout, including frameworks for considering equity in GSI planning and finding and utilizing downscaled climate model projections. A full matrix of resources is provided in Appendix A. The Guide and matrix are intended to be living documents that are updated and expanded over time. This Guide includes a roadmap for further advancing this work through the Green Infrastructure Leadership Exchange.

2. BACKGROUND

2.1 Stormwater Management Strategies

This section defines GSI and discusses its interrelationship with other stormwater management strategies, including grey stormwater infrastructure and larger nature-based solutions, to address water quality regulatory requirements and climate resilience goals.

2.1.1 Green Stormwater Infrastructure

Infrastructure is the basic equipment and structures essential for functional, healthy, and vibrant communities.¹ "Green" stormwater infrastructure (GSI) includes a range of measures that are engineered to passively capture and treat stormwater using natural processes. GSI measures are decentralized or "distributed", that is, they capture, slow, and infiltrate rain where it falls, thus reducing local stormwater runoff and improving the health of surrounding waterways.² The primary treatment mechanisms that GSI uses include:

- Retention (i.e., preventing discharge) of stormwater runoff through infiltration to the subsurface, evapotranspiration, or capture and use;
- Filtration of stormwater runoff through vegetation and biologically active treatment media (i.e., biofiltration); and
- Treatment using passive biological processes (i.e., biotreatment) to treat stormwater runoff before discharge.

GSI measures are intentionally sized and designed to meet water quality regulatory requirements or provide other specific hydrologic benefits. GSI typically uses vegetation and engineered soil or media systems; permeable pavement or other permeable surfaces or substrates; and/or storage for subsequent use.

Typical types of GSI, organized by treatment mechanism, include:

- Infiltration measures, including infiltration basins, infiltration trenches, bioretention,ⁱ drywells, and permeable pavement;
- Practices to promote evapotranspiration, including tree planting, green roofs, and impervious surface dispersion;
- Rainwater harvesting (i.e., cisterns or rain barrels);
- Biofiltration, including bioretention, planter boxes, vegetated swales, vegetated filter strips, and proprietary biotreatment devices; and
- Biotreatment basins, such as wet detention basins and constructed wetlands.

This document uses "GSI" to refer to these measures or "GI" when a cited report uses this acronym instead. GSI measures are also implemented at different scales, including:

- Street-scale facilities or "green streets", such as curb extensions and bulb-outs designed to treat roadway runoff;
- Parcel-based facilities, which are GSI measures sized to treat an entire parcel; and
- Regional facilities, which are GSI measures that treat runoff generated from a larger area, such as a neighborhood.

The ability of GSI to deliver multiple ecological, economic, and social benefits or services has made GSI an increasingly popular strategy. In addition to reducing polluted stormwater runoff, GSI practices can decrease urban heat, provide buffer for multi-modal transportation, reduce energy consumption, improve air quality, provide carbon sequestration, increase property prices, encourage nearby recreation, and provide other elements of community health and vitality that have monetary or social value.³ Moreover, GSI measures provide flexibility to communities facing the need to adapt infrastructure to a changing climate. For more details on the benefits of GSI for climate adaptation, see Section 2.3.

ⁱ While bioretention primarily uses biofiltration as a treatment mechanism, it can be designed to infiltrate captured stormwater or treat and discharge it. When designed to infiltrate, bioretention is sometimes called "bioinfiltration".

2.1.2 Grey Stormwater Infrastructure

Traditional "grey" stormwater infrastructure includes the curbs, gutters, catch basins, inlets, storm drain and sewer piping, detention basins, treatment plants, and outfalls used to collect and convey urban stormwater away from the built environment. Grey infrastructure collects and conveys stormwater from impervious surfaces, such as roadways, parking lots, and rooftops, into a series of piping that ultimately discharges stormwater into a local water body. Combined sewer systems (CSS) convey stormwater and various wastewater sources, typically to publicly operated treatment works (POTWs) designed to overflow. CSS and related POTW discharges of stormwater from overflows are regulated. Separate systems, which for public entities are known as municipal separate storm sewer systems (MS4s), only convey stormwater. Grey infrastructure is so-called because it is often constructed from concrete. It is designed to quickly convey stormwater and wastewater in and from urban environments and is often used to convey stormwater to and from GSI.

2.1.3 Other Nature-Based Solutions

Landscape or watershed scale nature-based solutions include large open natural spaces, riparian areas, wetlands, living shorelines, or greening of steep hillsides.⁴ These broad-scale, "blue-green" solutions provide hydrology and water quality benefits (i.e., integrated stormwater management of flow and pollutants), and are also essential in the toolbox for climate change adaptation, providing ecological benefits and recreational opportunities. In addition, landscape features such as urban forest patches, parks, street trees, and living walls can provide similar benefits within the built environment. Another example, "Living Shorelines" are protected, stabilized coastal edges that contain natural materials such as plants, sand, shells, or rock⁵ which can reduce erosion and property damage by reducing the velocity and intensity of waves.⁶ While these larger features are often referred to as "green infrastructure", they are typically not engineered to meet specific stormwater regulatory requirements, as GSI is (as defined by this Guide) and are not of focus in this Guide. Other examples of nature-based solutions not covered in this guide include measures focused on mitigating the impacts of extreme, back-to-back rainfall

or "cloudburst" eventsⁱⁱ. Copenhagen, Denmark, and New York City have studied and implemented projects that store and convey water where it is favorable during extreme rain events.⁷ Examples include conveying water along the roadway's center (rather than the edges) or the use of a concave or sunken park for temporary flood storage.

Landscape features, and other broad-scale, nature-based solutions may be explored in future versions of this Guide.

2.2 Climate Change Impacts

This section summarizes the overall regional impacts of climate change in the U.S. and Canada and climate-related vulnerabilities for society and ecosystems. The implications of these impacts on GSI policy, planning, design, and operations and maintenance are discussed in Sections 4, 5, and 6, respectively.

2.2.1 Regional Climate-Related Impacts

The Intergovernmental Panel on Climate Change (IPCC) is the United Nations body for assessing the science related to climate change. In the most recent Assessment Report (AR6⁸), the IPCC identifies 30 climatic impact drivers (CID) relevant to land and coastal regions. CIDs are physical climate system conditions (e.g., means, events, extremes) that affect an element of society or ecosystems. Depending on system tolerance, CIDs and their changes can be detrimental, beneficial, neutral, or a mixture of each across interacting system elements and regions.⁹ The CIDs applicable to GSI policy, planning, and design include the following listed in Table 1.

ⁱⁱ Cloudburst management is the management of extreme back-to-back rainfall events through intentional flooding, conveying, and storing water where it is favorable in the landscape.

Table 1. Climatic Impact Drivers Relevant to GSI Policy, Planning, Design, and Operations and Maintenance¹⁰

Climatic Impact Driver	Explanation
Extreme heat	Temperature event of exceptionally high magnitude with a very rare occurrence, such as greater than the 90 th percentile event.
Mean precipitation	Average precipitation.
River flood	Overflowing or accumulation of water over areas that are not normally submerged and often caused by unusually heavy rain. Fluvial floods are river floods versus rain (pluvial) floods.
Heavy precipitation with pluvial flood	Overflowing or accumulation of water over areas that are not normally submerged and often caused by unusually heavy rain. Pluvial floods are rain floods versus river (fluvial) floods.
Hydrological drought	A period with large runoff and water deficits in rivers, lakes, and reservoirs.
Fire weather	Weather conditions conducive to triggering and sustaining wildfires, usually based on a set of indicators and combinations of indicators including temperature, soil moisture, humidity, and wind. Does not include the presence or absence of fuel load.
Tropical cyclone	General term for strong, cyclonic-scale disturbance that originates over tropical oceans.
Snow, glacier, and ice sheet	Glacier is a perennial mass of ice and snow, and ice sheets are land masses of continental size.
Coastal flood	Overflowing or accumulation of water over areas that are not normally submerged and often caused by unusually heavy rain.

Figure 1 shows the direction of projected change (increase or decrease) for the nine CIDs in Table 1 for six regions in North America. The direction of change and confidence level is also shown in Figure 1. The future assessed changes refer to a 20 to 30-year period centered around 2050 and/or consistent with 2°C (3.6°F) global warming compared to a similar period within 1960-2014, except for hydrological drought, which is compared to 1850-1900.¹¹ In general, the northern, central, and eastern regions of North America are expected to have hotter and wetter extremes and, in some regions, more precipitation and fire weather. In western North America,

future changes are expected to be hotter and drier, with wetter extremes in some regions.¹²

A list of tools for assessing past and future climate changes regionally and locally is provided in Table 2. Table 2 is not intended to be a comprehensive list of all available resources but a starting point for examining climate changes, providing examples of the types of tools available.

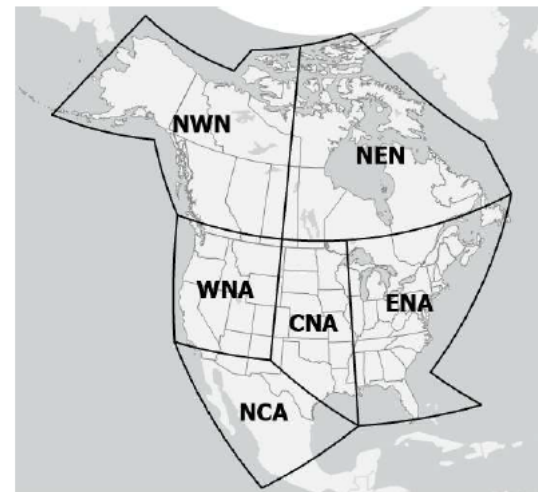
Region	Extreme Heat	Mean Precipitation	River Flood	Heavy Precipitation with Pluvial Flood	Hydrological Drought	Fire Weather	Snow, Glacier, Ice Sheet	Tropical Cyclone	Coastal Flood / Erosion
North-Western North America (NWN)	↑	↑	↑	↑		↑	↓		↑
North-Eastern North America (NEN)	↑	↑	↑	↑		↑	↓		↑
Western North America (WNA)	↑		↑	↑	↑	↑	↓		↑
Central North America (CNA)	↑		↑	↑		↑	↓	↑	↑
Eastern North America (ENA)	↑	↑	↑	↑		↑	↓	↑	↑
Northern Central America (NCA)	↑	↓		↑		↑	↓	↑	↑

Legend

High confidence of increase/decrease
Medium confidence of increase/decrease
Low confidence in direction of change or not relevant

Assessed future changes:

Changes refer to a 20 to 30-year period centered around 2050 and/or consistent with 2C global warming, compared to a similar period within 1960-2014, except for hydrological drought which is compared to 1850-1900.



Source: IPCC Working Group 1 Interactive Atlas: Regional synthesis

Iturbide, M., Fernández, J., Gutiérrez, J.M., Bedía, J., Cimadevilla, E., Díez-Sierra, J., Manzanos, R., Casanueva, A., Baño-Medina, J., Milovac, J., Herrera, S., Cofiño, A.S., San Martín, D., García-Díez, M., Hauser, M., Huard, D., Yelekci, Ö. (2021) Repository supporting the implementation of FAIR principles in the IPCC-WG1 Atlas. Zenodo, DOI: 10.5281/zenodo.3691645. Available from: <https://github.com/IPCC-WG1/Atlas>

Gutiérrez, J.M., R.G. Jones, G.T. Narisma, L.M. Alves, M. Amjad, I.V. Gorodetskaya, M. Grose, N.A.B. Klutse, S. Krakovska, J. Li, D. Martínez-Castro, L.O. Mearns, S.H. Mernild, T. Ngo-Duc, B. van den Hurk, and J.-H. Yoon, 2021: Atlas. In *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.J. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekci, R. Yu, and B. Zhou (eds.)]. Cambridge University Press. In Press. Interactive Atlas available from Available from <http://interactive-atlas.ipcc.ch/>

Figure 1. Projected change (increase or decrease) for selected climatic impact drivers in six regions in North America.

Table 2. Tools for Assessing Past and Future Climate Changes

Resource	Region	Description
IPCC Working Group 1 Interactive Atlas	Global	A tool for global observed and projected regional climate change information as described in the IPCC Sixth Assessment Report, including regional synthesis for Climatic Impact-Drivers (CIDs).
Climate Data Extraction Tool (Canada)	Canada	A tool for viewing and downloading statistically downscaled climate scenarios for Canada.
Climate Data for a Resilient Canada	Canada	Provides high-resolution historic and future climate projection summaries for Canadian cities/towns.
The Climate Explorer	United States	A tool to explore how climate is projected to change in any county in the U.S., including Hawaii and the U.S. territories. Provides interactive graphs and maps showing past and projected climate conditions to support the U.S. Climate Resilience Toolkit .
Climate Information for Water Resource Managers	United States	Maps and graphics showing weather and climate outlooks across the U.S. Provides resources for short-term (<1 week) weather forecasts to medium-term (monthly) outlooks to future sea level rise and climate projections.
Cal-Adapt	California	Tool for viewing and downloading future climate change projection data at the local level for California.

2.2.2 Climate-Related Vulnerabilities

Vulnerability is a function of the sensitivity of a system or population and the adaptive capacity of the same.¹³ Examples of climate-specific vulnerabilities are described below.

Human Health and Vulnerable Populations

Climate affects all areas of human health. Changes in air, water, food, and the environment will result in changes in the health and well-being of people. Increased heat waves, changes in precipitation, and sea-level rise affect health via multiple pathways. Human health risks associated with climate change are expected to increase in the future.

Some populations will be at higher risk from climate change impacts than others. Low-income communities and some communities of color are currently affected by

health disparities and are less resilient to the human health impacts of climate change. Existing health issues in native tribes across the U.S. and Canada are expected to be exacerbated by multiple climate-related factors, including the loss of traditional foods and practices, community displacement, flooding, decreased food security, and new infectious diseases.^{14,15} Children, older adults, low-income communities, some communities of color, and communities that experience discrimination are disproportionately affected by extreme weather and climate events.¹⁶ Other groups that may experience disproportional impacts from climate change include outdoor workers, residents of areas with poor environmental quality, and poorer communities, especially in rural areas.¹⁷ Communities with less access to information or support may be less able to avoid the health risks of climate change.¹⁸

Biodiversity

Biodiversity and species conservation is important for ecosystem balance and human populations (e.g., pollination of food crops). As the climate changes, many species are beginning to exhibit evolutionary adaptations in response.^{19,20,21} However, projections suggest that climate change may occur too rapidly for some species to adapt. The capacity for adaption varies by species and even among populations of the same species.²²

Changes in species ranges have been observed as a response to warming temperatures²³ as well as changes to migration patterns or life cycle events.²⁴ Climate change may increase invasive or non-native species,²⁵ leading to non-native species outcompeting native ones. Current and future stressors are projected to reduce the capacity of ecosystems to recover from extreme events like floods and fires. Climate change is projected to lead to losing iconic species from certain regions or becoming extinct altogether.²⁶

Urban Heat Island

The urban heat island effect refers to the tendency for urban areas to absorb and release solar heat,²⁷ resulting in higher local surface temperatures. Reducing the urban heat island effect is important to maintaining human health and biodiversity. Larger temperature differences have been observed in humid regions (primarily the eastern United States) and cities with larger and denser populations.²⁸ The urban heat island effect is projected to become stronger as temperatures rise and urban areas densify and grow.

Water Scarcity/Water Stress

Water scarcity and water stress are affected by both human and natural systems. Factors associated with climate change include changes in the quantity and quality of water supplies, changes in soil moisture, sea-level rise, and the frequency of extreme events.²⁹ Human systems that interact with these impacts include the vulnerability of water infrastructure, water withdrawals, and water-use efficiency. The vulnerability of water supplies to climate change is currently unknown since risks depend on future decisions and actions.

2.3 GSI for Climate Resilience

“Resilience”, as defined by the U.S. Climate Resilience Toolkit,³⁰ is “the capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a disruption.” GSI can be a valuable tool for communities to adapt to climate change and buffer against negative impacts. Many considerations can be incorporated into GSI planning and design to increase community resilience. Yet, at the same time, there are limitations to using GSI to solve all community climate-related challenges. GSI is a part of an extensive set of solutions to increase community resilience to climate change.

2.3.1 Managing Urban Flooding

The most apparent benefit for GSI to buffer against climate change impacts is the potential to reduce localized flooding associated with increased extreme precipitation (not including riverine or sea level rise related flooding). GSI can be designed to reduce runoff from larger precipitation events through infiltration and the incorporation of detention storage, reducing the potential of existing infrastructure becoming overwhelmed by storm events.³¹ When GSI is implemented in coordination with other landscape features connecting urban hydrologic and vegetations systems, significant benefits can be achieved.

2.3.2 Preventing and Reducing Erosion

GSI implementation can provide benefits in mitigating creek and coastal erosion. Projected future increases in flooding can cause increased runoff volumes and flow rates, leading to creek erosion, bank incision, degradation, and related water quality issues in downstream receiving waters. In reconnecting the natural water cycle

through runoff retention and infiltration in an urban watershed, GSI can reduce downstream hydrologic impacts. This can be implemented through GSI facilities at multiple scales, including street trees and green roofs, which can mitigate hydrologic effects in highly urban settings. Some erosive impacts related to sea-level rise and storm surges can be reduced through GSI facilities incorporating natural functions. Additional GSI benefits include improved habitat, water quality, and carbon sequestration.³²

2.3.3 Reducing Urban Heat Impacts

Communities can reduce heat island impacts through GSI including vegetation and trees providing natural heat-regulating services, such as shading, evapotranspiration, and thermal insulation of buildings.³³ Planting urban trees that focus on urban hot spots can appreciably reduce urban heat impacts.³⁴ Strategies targeting buildings such as cool roofs or green roofs can reduce heat absorption while reducing the energy needed to cool buildings and improve stormwater runoff.³⁵ Vertical green structures such as vegetated facades and walls have been found to provide similar heat mitigation benefits to green roofs but at a smaller magnitude.³⁶

2.3.4 Improving Air Quality

Urban trees, green roofs, and other vegetated GSI solutions can improve urban air quality, although the ability to do so is highly context dependent. GSI can improve air quality impacts on human health by introducing linear vegetative barriers between traffic and pedestrians.³⁷ Some evidence suggests that increased leaf area associated with certain GSI solutions can improve air quality by air pollution preferentially depositing onto vegetation.³⁸ However, implementation must be extensive enough to make an appreciable impact on ground-level air quality. For this reason, large "green walls" provide the most significant benefit for air quality.³⁹

2.3.5 Water Supply Augmentation

Stormwater harvesting and groundwater replenishment from GSI can increase local water supplies, buffer against droughts, and reduce energy requirements and emissions associated with importing water from other locations.⁴⁰ Stormwater can serve a range of non-potable uses such as irrigation, toilet flushing, and cooling.

Through regional capture projects, stormwater may be used to recharge groundwater, improving local potable water supplies.⁴¹ For example, the Orange Memorial Park Regional Stormwater Capture Project Park in South San Francisco will divert flow from a creek for water quality treatment, beneficial reuse (e.g., irrigation), and local flood reduction.⁴² The project will offset an estimated 15 million gallons of potable water per year (resulting in \$140,000 annually in water savings) and recharge 240 acre-ft to groundwater annually.

2.3.6 Human Health Benefits

GSI has been shown to improve human health outcomes across various categories⁴³ and can be utilized to address health disparities that may be exacerbated by climate change. Through proximity, passive recreation, or active recreation, people derive many positive benefits from GSI. Schools might be a focus area for GSI in many communities and adding greens spaces in schools has the potential to improve children's well-being, learning, and play while contributing to the ecological health and climate resilience of cities.⁴⁴

Tree density and proximity to passive and active green spaces have been shown to provide physical, mental, and behavioral benefits.⁴⁵ Direct physical benefits of green space include improved cardiovascular health, reduced respiratory diseases, and reduced obesity.⁴⁶ Mental health benefits are associated with a reduced risk of depression, anxiety, and mood disorders.^{47,48} Other benefits include a reduction in anti-social behaviors such as property and violent crime⁴⁹ and an improvement in helpful and generous behaviors.⁵⁰ Fewer studies are available on the human health benefits of specific types of GSI; however, similar benefits have been documented for green roofs, rain gardens, and bioswales.^{51,52}

2.4 GSI and Equity

The effects of climate change disproportionately impact low-income and minority communities, and GSI can play an important role in improving environmental and social equity outcomes. Low-income neighborhoods are more likely to be near or within industrial areas and have fewer parks, street trees, and other green spaces.^{53,54} In a recent study, McDonald et al.⁵⁵ showed that, on average, low-income blocks have 15.2% less tree cover and are 1.5°C (2.7°F) hotter than high-income blocks. In addition, minority neighborhoods are often at low elevations, vulnerable

to sea-level rise and aging or failing stormwater infrastructure. These communities will disproportionately feel impacts from rising temperatures, urban heat island effects, poor air quality, and flooding, further contributing to inequity in health and well-being.⁵⁶

By providing green spaces and a means for improved stormwater management, implementation of GSI in low-income and minority communities can help alleviate the negative impacts of climate change such as poor air quality, severe heat, and localized flooding. Integrating GSI projects with necessary infrastructure such as active transportation (e.g., bike lanes) and street improvement projects is significant for communities that rely most on public and active means of transportation.⁵⁷ Providing access to green spaces also can improve mental and physical health overall and can indirectly improve equity outcomes through visible investments that communicate worth.⁵⁸ As presented in the Equity Guide for GSI Practitioners,⁵⁹ well-designed green infrastructure programs can make direct contributions to equity in the following ways:

- Expand nature in communities,
- Increase resilience to climate hazards,
- Improve properties,
- Invest in economic stability,
- Create spaces that facilitate community cohesion,
- Increase community participation and power, and
- Build trust and acknowledge past harms.

It is critical to have equitable access to green spaces; however the distribution of GSI in urban planning is often itself inequitable. A joint study initiated in 2018 by the Cary Institute of Ecosystem Studies and the Urban Systems Lab assessed equity in GI Plans from 20 cities across the U.S. The researchers found that the patterns of urban greening tended to follow existing patterns of uneven urban development rooted in historical inequities (www.giequity.org). Furthermore, GSI is often implemented by municipalities when technically feasible based on physical site characteristics or necessary to support grey infrastructure projects, such as managing stormwater to reduce combined sewer overflows (CSOs) or improve water quality in streams (i.e., separate sewer systems).

It is important to consider multiple factors beyond engineering feasibility at the planning stages to address inequities in GSI implementation. At a workshop organized by NOAA and the Water Research Foundation in 2020, the organizers noted the importance of integrating physical science with social and infrastructure data to understand vulnerability, identify where improvements are most needed, and provide the most benefits.⁶⁰ Similarly, the U.S. Water Alliance suggests a cost-benefit approach and conducting triple-bottom-line analyses that include environmental, economic, and social impacts when selecting sites.⁶¹

"The City/County Association of Governments of San Mateo County has created a countywide Sustainable Streets Master Plan to help equitably adapt the roadway network to climate change and clean stormwater runoff to meet municipal stormwater regulatory requirements. Development of the Master Plan included an interwoven focus on equity, with prioritization criteria supporting projects in areas where 1) vehicle ownership is low and residents are more likely dependent upon active transportation or transit, 2) runoff volume is likely to increase the most due to climate change and lead to potential roadway flooding, 3) heat impacts are expected to worsen due to climate change, 4) multiple environmental or social vulnerable or disadvantaged community indicators overlap, and 5) there is lower tree canopy coverage that could benefit from increased urban greening."

Table 3 below provides links to useful resources for incorporating equity in GSI planning.

Table 3. Equity in GSI Planning Resources

GSI Equity Resource	Description
Equity Guide for GSI Practitioners	Resource developed through the Green Infrastructure Leadership Exchange by and for green infrastructure program managers offering a variety of tools to support practitioners in customizing community-informed equity work and evaluation plans.
Joint study by the Cary Institute of Ecosystem Studies and the Urban Systems Lab of 20 cities from across the U.S. assessing equity within GI Plans.	Key outputs from the project, including definitions for equity and green infrastructure, peer-reviewed publications, public presentations, and project-related web products.
GSI Toolkit for Equitable Investment – Georgetown Climate Center	How policymakers can design green infrastructure programs to prioritize environmental justice for communities facing disproportionate climate risk and pollution burden and resources that can be used to help fund projects in disadvantaged communities.
GSI Toolkit for Equitable Planning – Georgetown Climate Center	How to consider socioeconomic and other risk factors in green infrastructure planning.

2.5 Public Engagement, Communication, and Outreach

Early and consistent public engagement is necessary for success in GSI projects and is especially important for improving GSI equity outcomes. Engaging the public as early as possible in program or project planning is important to continue to work towards different types of equity goals.⁶² When thinking about how to make a case for considering climate change, resilience, and the role of GSI, program managers should consider the following factors:

- Leadership, buy-in, and partnerships;
- Storytelling, messaging, and education;
- Intergovernmental/intragovernmental coordination; and
- Levels of service and performance targets factoring in climate change impacts and system constraints (asset management project outcomes may address this).

It may seem that providing facts and unbiased information to people would lead them to make decisions in the same way. However, social science experiments have demonstrated that information alone is not the solution. People tend to interpret facts strongly in the direction of their past experiences. Rather than solely providing facts, meeting people where they are, finding common ground, and building partnerships through regular contact and communication is critical.

At the NOAA and the Water Research Foundation workshop in 2020, the organizers noted that engaging neighborhood residents as ambassadors was mutually beneficial. The relationships provided common understanding between City staff, utility staff, and community members and helped connect communities to project funding resources. This community-based approach achieved triple-bottom-line benefits for social, economic, and environmental resilience. The partnerships succeed when:⁶³

1. Partners speak a common language. Community members respond when they understand the impact of their behaviors on the environment. Water and climate professionals implement better resilient strategies when they understand community impacts and needs.
2. The utility and the community work together. If community members feel ownership of the project, they take pride in it, which is vital for long-term maintenance.
3. Community members have trusted relationships with the utilities. Relationships are a two-way street: they help planners and engineers understand what the community wants and needs, and they give community members a window into water infrastructure and climate issues—as well as greater awareness of water careers.

Communication and outreach strategies for GSI may include a variety of platforms such as presentations and workshops, media campaigns, websites, written materials, inter-agency partnerships, and/or connections through community-based organizations. When working with minority communities, GSI practitioners should recognize language barriers and plan to produce materials in the language(s) of the target audiences. Other ways to promote accessibility and equity in the community engagement process include providing directions to a location from public transit, including contact information to request accommodations, holding meetings outside of typical working hours, and offering food or childcare. Community pop-up events

and joining with pre-existing events (e.g., cultural festivals) can also be an effective means of community engagement and buy-in. Additional information on [Communication Strategies for Green Infrastructure](#) is available through the Georgetown Climate Center.

2.6 Limitations of GSI

GSI cannot solve all community climate-related challenges. While local governments are in a good position to promote sustainable stormwater management on a larger scale, they also face complex challenges in implementing and maintaining GSI. Resources are limited, responsibilities are fragmented, and the tolerance for risk is generally low.

Unless GSI is implemented at a watershed scale, it is unlikely that it would be able to completely address receiving water quality impairments. The climate benefits of distributed green street and parcel-based GSI facilities may be overwhelmed by unmitigated existing urban areas.

Similarly, although GSI can assist in mitigating localized flood impacts, GSI facilities that are sized for water quality treatment will become saturated and bypass larger flows, providing minimal flood benefit during large storm events.

GSI requires maintenance to continue to provide water quality and hydrologic benefits. Without a dedicated O&M funding source, GSI facilities may lose their ability to provide climate resilience benefits over time.

Given the existing built environment, a combination of management measures, including GSI and other solutions, will continue to be needed to achieve greater benefits and more resilient communities.

3. POLICY AND REGULATORY REQUIREMENTS

This section summarizes existing policies and regulations relevant to GSI and climate change and discusses the importance of incorporating resilience into future policies and regulations. This section also touches on the role of grants and funding options for infrastructure improvements that prioritize projects in disadvantaged communities and community partnerships.

3.1 Policies and Regulations Concerning GSI and Climate Resilience

In the United States, the Federal Water Pollution Control Act was amended in 1972 to become the Clean Water Act (CWA). The CWA prohibits discharge of pollutants to waters of the United States from any point source unless the discharge complies with a National Pollutant Discharge Elimination (NPDES) permit. A framework for regulating municipal, industrial, and construction stormwater discharges under the NPDES program was amended to the CWA in 1987.ⁱⁱⁱ In 1990, USEPA published final requirements for stormwater permits for MS4s^{iv} serving a population of over 100,000 (Phase I communities). In 1998, USEPA published final requirements for MS4s serving populations under 100,000 (Phase II communities). Discharges from CSSs, combined sewer overflows (CSOs), are also regulated under NPDES permits.

Through these requirements, owners/operators of MS4s are required to develop, implement, and enforce a stormwater management program that includes post-construction runoff control along with other program areas. The post-construction runoff control program requires control of pollutant loads, volume, and flowrate impacts of stormwater runoff from development. Communities with CSOs must comply with the CSO Control Policy, which requires pollution prevention and other controls.

Climate change resilience has not been substantially amended to these regulations at the federal level. However, some state and local regulations and policies focus on

ⁱⁱⁱ under Section 402(p).

^{iv} An MS4 is a conveyance or system of conveyances that is: owned by a public entity and discharges to waters of the US; designed or used to collect stormwater; not a combined sewer; and not part of a sewage treatment plant.

resilience and are also relevant to stormwater management. In the United States, for example, the NPDES permit issued in 2022 by the San Francisco Bay Regional Water Quality Control Board requires that permittee's Green Infrastructure Plans are consistent with climate change adaptation plans. The permit also requires long-term green infrastructure implementation to consider linkages to climate change impacts and resilience.⁶⁴ All permittees must complete a Climate Change Adaptation Report by 2026, identifying potential climate change-related assets and appropriate adaptation strategies.

Canada does not have national regulations for stormwater similar to the US NPDES requirements. However, Canadian provinces and cities do have to meet other environmental and infrastructure requirements and goals in a sustainable manner.⁶⁵ An example of a local resilience standard in Canada includes the Toronto City Council's adopted Version 4 of the Toronto Green Standard (July 2021). This Standard addresses resilience through, "enhanced green infrastructure to manage stormwater runoff, reduce urban heat island impacts and promote biodiversity (including more extensive and higher performance green roofs), bioswales, rain gardens, native pollinator species plantings and a new requirement for "green streets" (roads or streets that incorporate green infrastructure)."⁶⁶ These standards apply to new development applications beginning May 2022.

Complimentary to the growing body of GSI regulations that consider climate change impacts, many state grant programs, and federal infrastructure funding options are focusing on climate resilience related to stormwater projects (for example, California Climate Resilience Package funds).⁶⁷ These funding options also emphasize and/or require project implementation in disadvantaged communities.

3.2 Incorporating Resilience into Policies and Regulations

Municipalities and other local agencies may incorporate resilience into local policies and regulations in response to regional, statewide, or federal regulations and/or to protect infrastructure. Climate adaptation touches on many municipal departments that might not have a history of working together and that may have competing interests. As such, interagency and interdepartmental coordination and collaboration at various levels of governance are critical for resilience. In addition, broader partnerships and multi-disciplinary collaboration will be needed. More specifically, GSI project implementation increasingly involves the private sector (e.g.,

developers) and schools, requiring partnerships between landowners with different motivations and requirements. Engaging local communities and addressing equity issues to collaborate and realize a unified vision will also be essential.

Local GSI-related policy and regulatory changes that integrate climate resilience may include:

1. Policy updates, for example:

- A requirement that the planning, design, and construction of projects and GSI facilities consider and incorporate resilience against climate change impacts for a specified climate change scenario and planning horizon. Such a requirement could require larger sizing of facilities or require specific treatment mechanisms, such as increased retention or detention.
- For proposed GSI, a requirement to consider climate adaptation, mitigation, equity, and integration with other green or grey infrastructure (e.g., cloudburst management) for greater resilience in planning and implementation.
- For existing GSI, a requirement to update asset management, operations and maintenance, system modeling, and assumed performance to address changing precipitation patterns, heat, and other climate risks to adequately understand system performance and maintenance needs. Depending on the outcomes of the updates, existing facilities may need to be retrofit or modified to better respond to changing conditions.
- Flexibility to enable the mixing of private and public stormwater to allow common or regional GSI facilities to benefit from private development contributions and vice versa.
- Requirements to integrate resilience planning across departments (i.e., stormwater compliance/public works, transportation, urban forestry/parks, climate adaptation planning, local hazard mitigation planning, water supply, sewer, etc.) and align environmental policies on resilience.

2. Updates to ordinances, design guidelines, and standard details and specifications for public and private new and redevelopment GSI, as well as other public infrastructure projects, to consider projected changes in

precipitation patterns, sea-level rise, temperature, and other climate impacts. Such updates could require redundancy through multi-layered grey-green stormwater infrastructure systems for unpredictable volumes and flow rates.

3. Adaptive management of policies and standards to respond to and anticipate changing conditions due to climate change and its environmental impacts and confirm that existing policies do not result in unintended challenges with GSI implementation.

3.3 Next Steps

Additional development of GSI policy guidance in the context of climate resilience could be incorporated into future parts of this Guide. This could include:

1. Methods for conducting risk assessment relating to GSI performance. Specifically, whether GSI can meet future and anticipated regulatory requirements given current implementation practices, including scenario planning to examine a potential range of outcomes.
2. Guidance for policy decision-making including options for addressing uncertainty with respect to climate change impacts to GSI and utilizing the outcomes of GSI risk assessments.
3. Potential management questions to be addressed in policy updates for climate resilient GSI planning and design.
4. Development of model policy language to address opportunities for improving climate resilience in GSI planning and implementation
5. Economic evaluation guidance relevant to GSI, including methods for GSI lifecycle assessments with consideration of different future climate-related standards. Economic/risk evaluation guidance could also consider how benefits from GSI could be incorporated into bond ratings that consider climate resilience.

4. GSI PLANNING

This section explores considerations for GSI planning related to climate resilience and incorporating climate resilience into GSI planning. As equity considerations and community engagement are important throughout the GSI implementation processes, these components are touched on below.

4.1 Considerations for GSI Planning Related to Climate Resilience

GSI planning entails several steps, including site and opportunities assessment, selection of GSI types, initial layout, permitting, and conceptual design. The scale at which GSI planning is conducted can range from a single property, block, neighborhood, or subwatershed to an entire City, County, or region. The full benefits of GSI may be better achieved when these measures are planned at the regional or watershed scale. Regional scale planning may also consider linkages to related municipal water and sewer infrastructure and land management activities aimed at achieving "One Water" outcomes. Public outreach should be included in planning to provide project direction and garner support for planned GSI. GSI siting considerations and objectives that may be considered in planning assessments include those relating to:

- Ease of implementation, such as location, ownership, accessibility, physical and site use/programming constraints.
- Performance considerations, including hydrologic and hydraulic factors and favorable subsurface conditions.
- Potential benefits, including improved water quality, flood management, groundwater recharge, stormwater capture, and reuse, urban greening, equity, and biodiversity.
- Incorporating social data such as identifying disadvantaged and vulnerable communities.
- Funding sources and capital and maintenance costs.
- Cost-effectively complying with applicable regulatory requirements.

Future stormwater regulations may require incorporating resilience into GSI planning, however, even in the absence of specific regulatory drivers, stormwater agencies may want to consider the additional risk climate change impacts pose. Climate resilience should be considered in GSI planning when:

1. Climate change could impact GSI performance, or
2. GSI has the potential to improve community resilience (e.g., providing flood reduction or drought resilience).

Considerations for these separate, but related, GSI planning goals are explored in the sections below.

4.1.1 Potential Impacts of Climate Change on GSI Performance

Projected climatic impact drivers, including changes to snowmelt, larger storm events, higher rainfall intensities, longer duration events, and increased soil moisture, are likely to reduce the effectiveness of GSI facilities⁶⁸ by reducing the proportion of runoff volume that may be captured and treated. Climate change may also impact the ability of GSI designed per current guidance to meet or partially meet current water quality or flood control targets. Higher temperatures cause greater stress to vegetation in GSI facilities. Projected sea and lake level rise may impact feasible locations for GSI due to inundation and rising groundwater levels.

Potential changes to or considerations of how GSI planning processes can better incorporate GSI facility resilience could include:

1. Locating GSI where climate change is less likely to impact GSI performance (e.g., avoiding: rising groundwater or surface water levels, areas of increased flood ponding, increased heat and impacts to plants, reduced irrigation water supply, or microclimates in the region observed or projected to have more extreme precipitation or heat).
2. Setting volume-based runoff capture targets to prevent inundation and erosion of GSI facilities. Such targets may differ from or exceed current local regulations.
3. Recommend GSI types and general plant/tree selection considerations with consideration of projected changes to climate.

4.1.2 Opportunities for GSI to Increase Community Resilience

There are a number of opportunities for GSI to increase climate resilience, as described previously in section 2.3. Increased precipitation associated with larger storms under climate futures may have undesirable impacts on roadway and transit infrastructure, especially for vulnerable communities, where multi-scale GSI implementation at a watershed level may provide valuable relief to associated public infrastructure like streets and roads. Climate change may also exacerbate other conditions that GSI is implemented to partially mitigate, such as the urban heat island effect, localized flooding, or impacts on disadvantaged communities. GSI may also become part of the toolbox in thinking more strategically about integrated water planning to address prolonged drought.

Potential changes to or considerations of how GSI planning processes can incorporate climate resilience provided by GSI could include:

1. Locating GSI to more optimally meet anticipated climate-related regulations or policy.
2. Setting volume-based runoff capture targets to target projected localized flooding or water quality concerns, which may differ from or exceed current local regulations.
3. Locating GSI to provide additional climate-related resilience benefits (e.g., localized flooding benefits, urban heat island benefits, water supply benefits, combined park and water storage opportunities, community resilience, and active transportation options).
4. Including social and infrastructure data to understand community climate-related vulnerability, including in underserved communities, identify where climate-related improvements are most needed, and locate GSI where it can address some of these needs.
5. Considering GSI projects across scales to assess potential benefits to the greater green infrastructure and natural heritage system, improving landscape connectivity and system resilience.
6. Recommending GSI types and general plant/tree selection considerations to maximize climate resilience-related benefits in the planning stage.

In addition to the planning considerations above, larger-scale water quality and pollutant loading changes resulting from climate change should be considered. These include but are not limited to:

1. Rising temperatures resulting in increased water temperatures in receiving water bodies; and
2. Increases in eutrophication, especially in shallow water bodies.

GSI facilities or planning strategies previously developed to meet specific water quality goals may require updating as other water quality impacts become evident and/or are included in regulations.

4.2 Incorporating Climate Resilience into GSI Planning

Additional objectives and siting considerations may be needed to incorporate these climate-resilience considerations in the earliest phases of GSI planning and assessment. Incorporating climate resilience considerations into a community's GSI planning may entail stakeholder and municipal interdepartmental meetings to identify and prioritize climate-related objectives. This may also entail additional steps, data, desktop, or field studies when performing GSI opportunity analysis (i.e., identifying locations to implement GSI). Suggested approaches for how to incorporate climate resilience considerations in GSI planning are provided in this section.

Planning and decision-making processes to incorporate climate-resilience considerations into GSI opportunity analyses may entail:

1. Identifying management priorities relating to GSI planning and design in the context of climate resilience, including:
 - Compliance with new regulatory requirements or policies relating to climate change;
 - Implementation or retrofit to achieve more resilient GSI; and
 - Optimization of GSI locations and capacity at a subwatershed scale to maximize resilience-related benefits.
2. Identifying when in the planning process to consider climate resilience, such as:

- Formation of planning objectives, prioritizing those facilities that can comply with resilience requirements or provide enhanced climate resilience.
 - Developing partnerships with stakeholders and community members to implement GSI for climate resilience goals, including "One Water" type strategies.
 - GSI siting, to account for future potential impacts of climate change (e.g., hydrologic, temperature, and groundwater level changes) on GSI performance.
 - Identification of GSI types, and extent and types of landscape/vegetation and trees, to maximize the resilience benefits provided as well as performance (adapting tree and plant species to changing climate conditions)
 - Integration and coordination with other infrastructure and community plans to incorporate GSI or avoid conflict with other larger-scale climate resilience efforts.
3. Identifying planning-level climate resilience data or projections to consider for GSI implementation, for example:
- Watershed-level quantitative targets (i.e., reduced flows or volume) for resilience.
 - The range of projected changes to precipitation patterns (e.g., calculated predictions for future floods, design storm frequencies) and potential design changes (as available and appropriate) for successful GSI performance.
 - Location and frequency of minor localized flooding or large flooding events.
 - Changes to groundwater level, including locations and frequency of flooding due to surfacing groundwater.
 - Areas, timing, and duration of urban heat stress.
 - Opportunities for groundwater recharge or capture and reuse.
 - Land use and ownership characteristics that may streamline or hinder GSI implementation or performance.
 - Relevant equity indicators.

- Community goals, concerns, and priorities for GSI and climate resilience.

4.3 Next Steps

Additional development of GSI planning guidance in the context of climate resilience could be incorporated into future parts of this Guide. This could include:

1. Guidance on decision-making processes to establish community climate resilience priorities for GSI, including:
 - Compiling regulatory requirements and how they may be achieved through GSI.
 - Establishing a comprehensive list of multi-benefit objectives.
 - Identifying relevant stakeholders and performing outreach.
 - Developing cost-benefit analyses relating to GSI and climate resilience.
 - Planning in response to adjusted requirements or design standards that consider climate change.
2. Guidance on suggested data, indicators, and metrics to locate and prioritize GSI, for example:
 - Identifying data needs relating to GSI and climate resilience (such as projected temperature changes, projected precipitation changes, flood modeling output, water quality data and/or modeling output, etc.).
 - Developing benefit metric increments that could be used to identify whether a specific location and type of GSI could provide climate resilience.
 - Description of the geospatial, other modeling, and calculation methods that could be used to analyze benefit metrics and drive implementation targets.
3. Guidance on geospatial processes to locate GSI opportunities:
 - Listing GSI opportunity analysis data needs in the context of climate resilience, such as land use, ownership, physical properties including soil, depth to groundwater, utility conflicts, etc.
 - Describing logic-based geospatial analyses to identify beneficial GSI candidate sites and remove less-favorable opportunity locations.

- Planning frameworks that address uncertainty (e.g., Robust Decision Making).
4. Guidance on incorporating needs and priorities of disadvantaged communities, identifying successful approaches for community engagement, and encouraging the equitable implementation of GSI to achieve long-term success in the context of a changing climate.
 5. Developing an evaluation framework to prioritize project opportunities to robustly capture considerations related to environmental performance, climate change risk, and social vulnerabilities and benefits.

5. GSI DESIGN

Several climatic impact drivers related to GSI are projected to change in the future and would likely affect GSI design. These drivers include precipitation, including changing storm event characteristics such as the size, intensity, duration, and location of significant rain events,⁶⁹ along with flood and submergence from rising sea, riverine, and groundwater levels and extreme temperature. Impacts are anticipated at different scales, and while there is a need for adaptation at the facility, project, and sub-watershed scale, the section below focuses on GSI design at the facility scale. This section introduces the established approach (i.e., that is currently in use) for GSI siting, sizing, and design, describes climate-related considerations that may be needed, and suggestions on how to incorporate changes to GSI siting, sizing, and design approaches given climate trends.

5.1 Established Conceptual Model for GSI Siting, Sizing, and Design

Following the adoption of federal requirements for stormwater management in the 1980s, researchers published findings on how post-construction stormwater volumes and loads could be appropriately controlled. The results of an early study by Schueler⁷⁰ were widely adopted by regulatory agencies and used in subsequent technical guidance. That study recommended that stormwater best management practices (BMPs) should be sited and designed to 1) reproduce the hydrologic conditions of the downstream receiving water; 2) provide a moderate level of removal for most urban pollutants; and 3) have a neutral impact on the natural and human environment.⁷¹

Many of these early studies focused on a general class of stormwater BMPs, including detention and non-biological filtration type facilities. Conventional detention-type stormwater BMPs capture stormwater from large storm events and release it over time to reduce runoff intensity. The use of low impact development (LID) and GSI was promulgated under subsequent NPDES stormwater permits in the late 2000s and early 2010s. LID requirements focused on mimicking a wider range of natural hydrologic functions beyond runoff discharge, including rainfall interception, shallow surface storage, evapotranspiration, and infiltration/ groundwater recharge.⁷²

LID technical guidance focused on siting GSI and other stormwater management facilities by considering physical constraints, including underlying soil or geotechnical characteristics, slope, depth to groundwater, proximity to wells or infrastructure, and anticipated pollutant loading into the BMP. Physical siting characteristics that increase the potential volume that can be retained by the facility (i.e., infiltration, capture and use, and evapotranspiration) were also incorporated.

5.1.1 Stormwater Facility Sizing

For many locations and depending on the regulatory agency, sizing requirements for total runoff captured for conventional stormwater facilities and GSI have remained unchanged for the past two decades. GSI technical guidance also recommends maximizing the retention of captured stormwater.

When examining the percent of total average annual runoff captured and treated as a function of BMP size, a "knee of the curve" is evident for most sites. This change in the instantaneous slope of the curve represents the point at which increases in BMP size (and cost) yield diminishing returns in total runoff captured and treatment effectiveness. For example, in California, the "knee of the curve" occurs at approximately the 75th-85th percentile storm event, corresponding to approximately 80% of average annual stormwater runoff (Figure 2). When a flow-based facility is designed to capture a larger rainfall intensity, a similar "knee of the curve" is found (e.g., 0.1 – 0.25 inches per hour in California).⁷³ This pronounced knee of the curve for both volume and flow-based sizing approaches allows for GSI cost efficiency while providing sufficient stormwater capture to reduce runoff volumes and pollutant loads in downstream receiving waters.

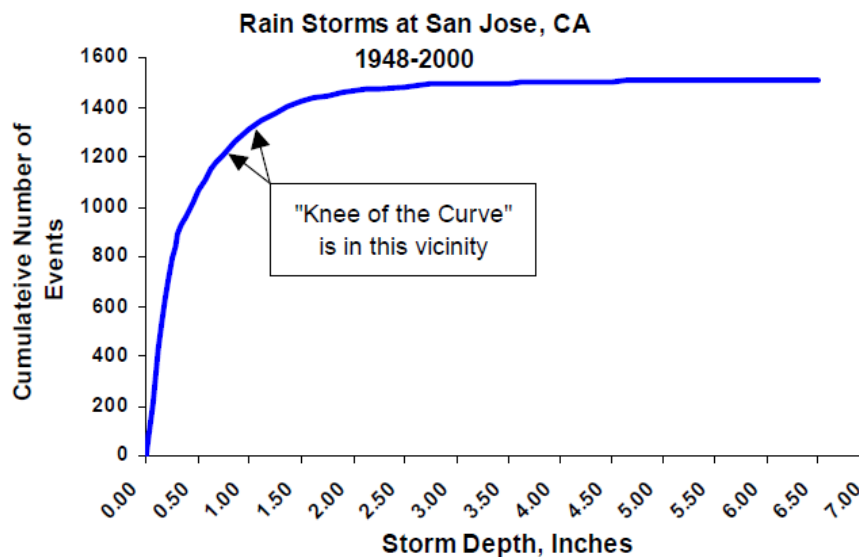


Figure 2. Example "Knee of the Curve" based on Historical Data⁷⁴

5.1.2 GSI Component Design

Technical studies of early GSI applications resulted in recommendations for typical GSI components. These components include GSI media, vegetation, and hydraulic elements (i.e., inlets, outlets, and underdrain).

Media

Following several studies identifying reduced infiltration of GSI facilities over time, media mixes were studied to identify how to avoid a decrease in performance. These studies identified that a fast filtration rate through the media (e.g., a minimum of 5 inches per hour in the San Francisco Bay Area) was required to prevent clogging. Faster drawdown of stored volume was also thought to prevent vector issues.

To provide these very fast infiltration rates, the proportion of clay in the media mix (for example, present in native topsoil used as a component) had to be greatly minimized or removed. Many regions adopted media mixes that were heavily sand-based and would therefore drain very quickly. This has resulted in benefits with reducing clogging potential but has resulted in other issues relating to plant health and irrigation requirements that are likely to be exacerbated with rising temperatures. This is particularly relevant for locations expecting to see increasing frequency, duration, and intensity of drought conditions.

Vegetation

Healthy vegetation is a key component of GSI performance. Plants provide biological treatment of pollutants, help maintain infiltration, and increase evapotranspiration. Given the harsh conditions in GSI facilities (i.e., episodic periods of submergence and desiccation), site-specific and more resilient plant palettes are needed

Hydraulic Elements

GSI technical manuals often recommend that facilities be designed to be "off-line" or installed such that only a portion of the total runoff is diverted to the facility. This avoids impacts of erosion and extended submerged periods that may occur otherwise. Inlets, underdrains, and outlets (including orifice-controlled outlets) are frequently sized to capture the required historic flow volume to meet water quality requirements.

5.2 Considerations for GSI Related to Climate Resilience

While the impacts on GSI are expected to vary by region, location, and type of facility, larger storm events, higher rainfall intensities, longer duration events, and more saturated initial conditions are likely to reduce the effectiveness of GSI facilities.⁷⁵ Other climate change impacts, including rising groundwater and changes in temperature, may also affect GSI siting and performance.

5.2.1 Hydrologic Impacts: Precipitation Change and Early Snowmelt

Design standards are typically developed based on multiple decades of historical precipitation data. GSI facilities are currently designed with the implicit assumption that past rainfall-runoff patterns will persist over their design life. Since climate change is anticipated to alter historic rainfall-runoff patterns, facilities may be in jeopardy of underperforming in the future. Climate change is projected and has already been observed to affect precipitation patterns. Rainfall is becoming more intense in many locations and less frequent in others. When the proportion of smaller, low-intensity events and larger, high-intensity events is altered, the amount of total stormwater runoff captured by a GSI facility may change. When this results in a smaller overall amount of runoff captured, the facility may no longer provide the hydrologic or water quality benefits it was designed to provide. In addition, the "knee of the curve" may be entirely shifted or become less pronounced. In the future, it

may not be appropriate to preclude larger facility sizes for providing diminishing returns.

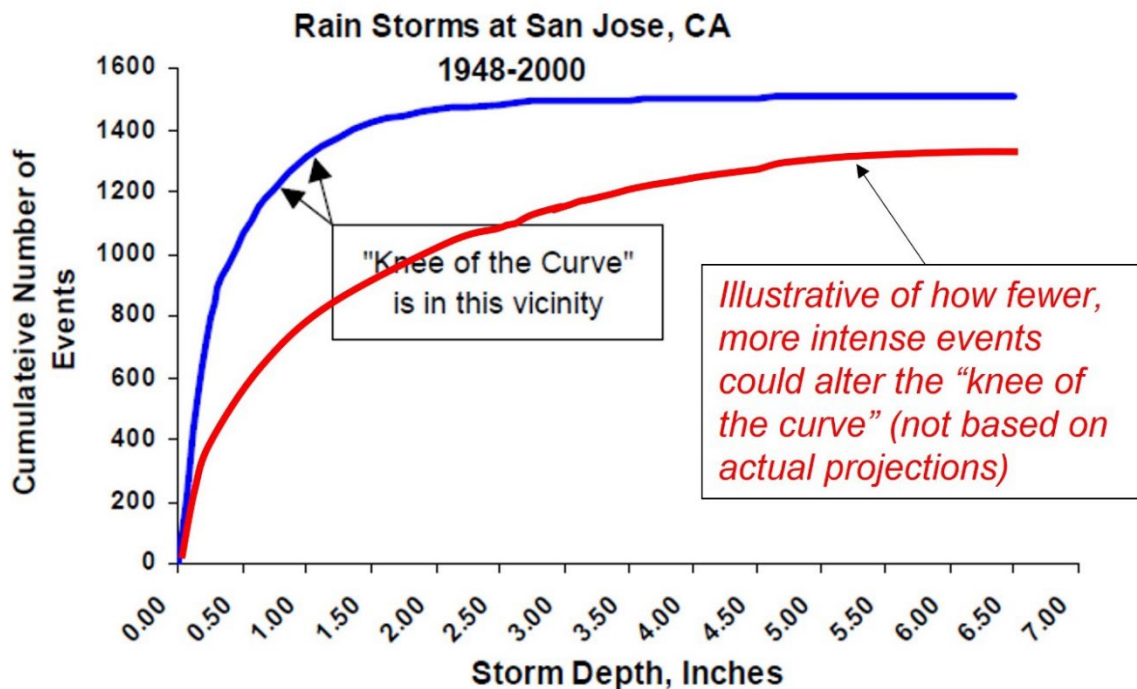


Figure 3. Altered "knee of the curve" sketch due to climate change impacts.

Based on modeling results from downscaled Global Climate Models^v (GCMs) and hourly precipitation developed through an application of regional weather modeling for Western Washington, Figure 4 provides an actual example of an altered "knee of the curve."⁷⁶

^v Global Climate Models (GCMs) are a representation of the major climate system components - atmosphere, land, ocean, and sea ice - and their interactions. They are used for forecasting climate change.

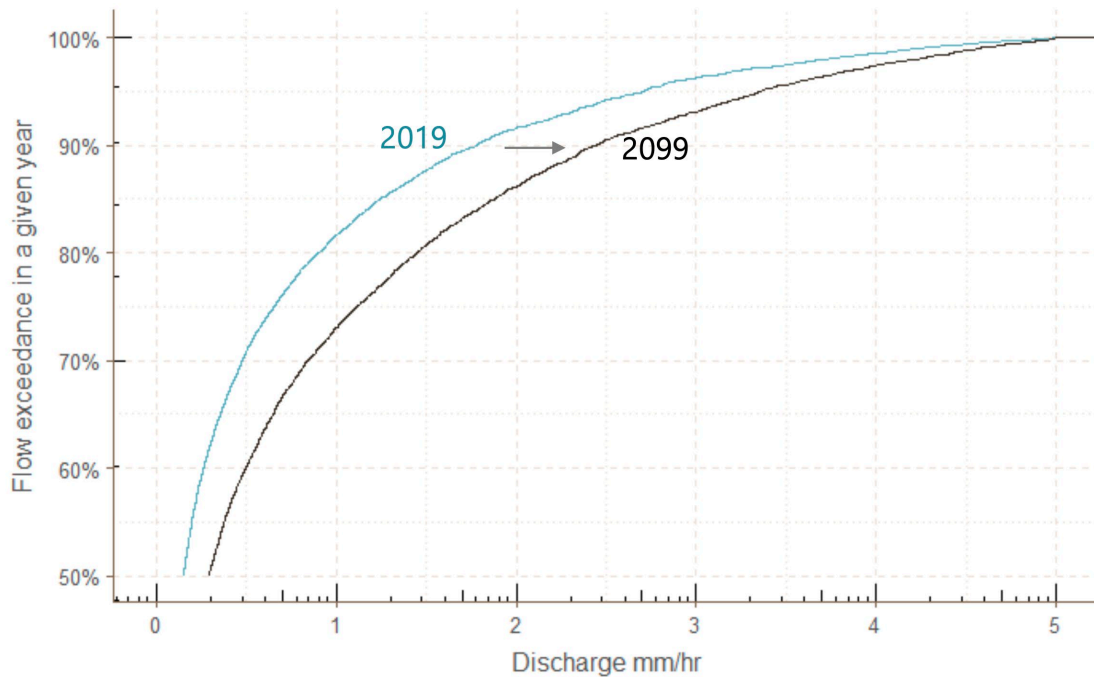


Figure 4. Actual altered "knee of the curve" due to climate change impacts in Western Washington.

In addition, more intense, less frequent storm events and other precipitation changes could affect facility performance. For example, an increased frequency of intense "back-to-back" winter storm events and atmospheric rivers has been observed in the western United States, while the eastern United States has seen an overall increase in very heavy precipitation (defined as the top one percent of all daily events) (Figure 5).

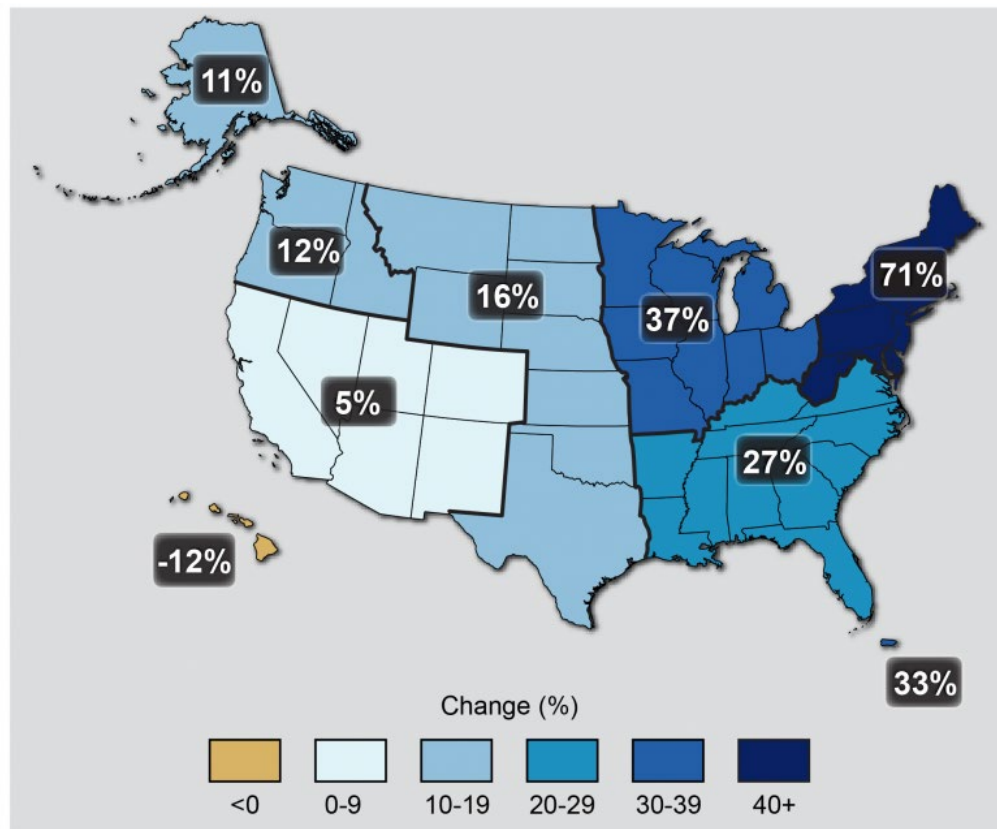


Figure 5. Map of the observed change in very heavy precipitation (defined as the top 1% of all daily events) from 1958 to 2012⁷⁷ in the U.S.

Beyond increased runoff from precipitation, conditions within the GSI facility itself may be impacted. When more storms occur in a shorter time, the ability of the GSI facility to drain, dry out, and capture the next storm is diminished, and runoff capture performance is reduced as systems bypass increased or cumulative flow.

Communities with CSSs may see an increase in CSOs or combined sewer discharges (CSDs) with increased large storm events. The performance of GSI implemented to provide upstream retention and detention may be impacted and result in impacts to the downstream POTW.

Seasonal precipitation changes, such as an extended dry season or longer dry periods between storms, may result in reduced water quality performance. These changes, which have already been observed in some locations, may cause an increase in pollutant accumulation on the landscape. Higher concentrations of

pollutants in seasonal first-flush events could impact GSI facility performance and may require additional pretreatment to maintain performance.

5.2.2 Other Impacts: Temperature and Sea Level Rise

Temperature changes may affect the performance of specific GSI design components. Some researchers have argued that increased temperature associated with climate change may lead to better performance of GSI due to reduced water viscosity and increased infiltration,⁷⁸ though temperature differences related to GSI performance vary by facility type with bioinfiltration showing more sensitivity than pervious pavement.⁷⁹ Media mixes with a high proportion of sand may dry out too quickly to maintain vegetative health when temperatures are higher. Vegetation that may have thrived in lower temperature fast-draining facilities may be increasingly stressed under higher temperatures.

Subsurface changes should also be considered for resilient GSI. Groundwater levels may rise due to increased nearby lake and sea levels. As sea levels rise, the risk of saltwater intrusion increases. As a result, areas with relatively shallow groundwater that were once suitable for GSI may no longer be appropriate.

Groundwater level rise near freshwater lakes like Lake Ontario may also cause periodic sustained inundation of the root zones of GSI facilities, causing potential rotting of roots and plant failure. More resilient species selection and grading design will need to be incorporated to anticipate these potential climate impacts.

5.3 Incorporating Climate Resilience into GSI Sizing and Design

The challenges described suggest the need for an updated approach to sizing and designing resilient GSI. Details of how climate resilience could be incorporated into GSI sizing and design are introduced in this section.

5.3.1 GSI Sizing

As described, hydrologic changes may necessitate updated GSI facility sizing guidance. This could include “dynamic sizing” approaches that more fully consider facility drawdown processes, as well as considerations of projected changes to local precipitation patterns.

Precipitation projections from Global Climate Models (GCMs) may be used in place of historic rainfall observations to design GSI facilities appropriately. However, most GCMs do not have an adequate spatial or temporal scale needed to represent urban stormwater. Most GCMs operate on a daily timestep, whereas urban storm events occur in minutes or hours. Several regions have begun to develop spatially and temporally downscaled models to provide refined precipitation datasets for stormwater managers. Local universities or state resources have often developed regionally downscaled models and identified GCMs that better represent their region. These downscaled models typically use GCM results as inputs to a regional weather forecasting model to provide more detail. The resulting precipitation data sets have a finer spatial and temporal resolution (e.g., 1-hour vs. 1-day).

While GCMs provide reliable results on a continental scale, they often suffer from both transient and system biases when compared to observed rainfall. Therefore, downscaled model outputs usually need to undergo bias correction before they can be used for planning. Additionally, regions with highly variable microclimates may require additional spatial downscaling or interpretation to be effectively used for facility sizing.

Selection of GCMs

GCMs are run for a historical period (hindcasting) and a future period (forecasting). Using the historical period, practitioners can compare GCM results with observed precipitation in the region. Different GCMs will vary in their potential applicability to a specific region. GCMs that perform poorly for the region, as tested by local researchers, universities, or state agencies, can be excluded.

Selection of Emissions Scenarios

The IPCC regularly selects and updates Representative Concentration Pathways (RCPs), reflecting the range of plausible future emissions scenarios (Table 4). Climate change predicted under higher RCPs is typically more severe, although precipitation impacts do not always scale with increased warming.

Table 4. Summary of IPCC Emission Scenarios (adapted from IPCC AR5, 2014⁸⁰)

Scenario	CO ₂ -eq Concentrations in 2100 (ppm)	Change in CO ₂ -eq emissions compared to 2010 (in %)		Likelihood of temperature change relative to 1850-1900 remaining below:			
		2050	2100	+1.5°C	+2°C	+3°C	+4°C
RCP2.6	430 – 480	-72 to -41	-118 to -78	More unlikely than likely	Likely	Likely	Likely
RCP4.5	580 - 720	-38 to 24	-134 to -50	Unlikely	More likely than not		
RCP6.0	720 - 1000	18 to 54	-7 to 72		Unlikely	More unlikely than likely	
RCP8.5	> 1000	52 to 95	74 to 178		Unlikely	Unlikely	More unlikely than likely

Although each RCP varies with respect to atmospheric carbon and long-term warming effects, climate change models suggest similar surface warming over the next 30-40 years (Figure 6). This period is equal to the design life of most GSI facilities. Therefore, projects implemented in this decade (i.e., the 2020s) can expect similar results regardless of the specific RCP.

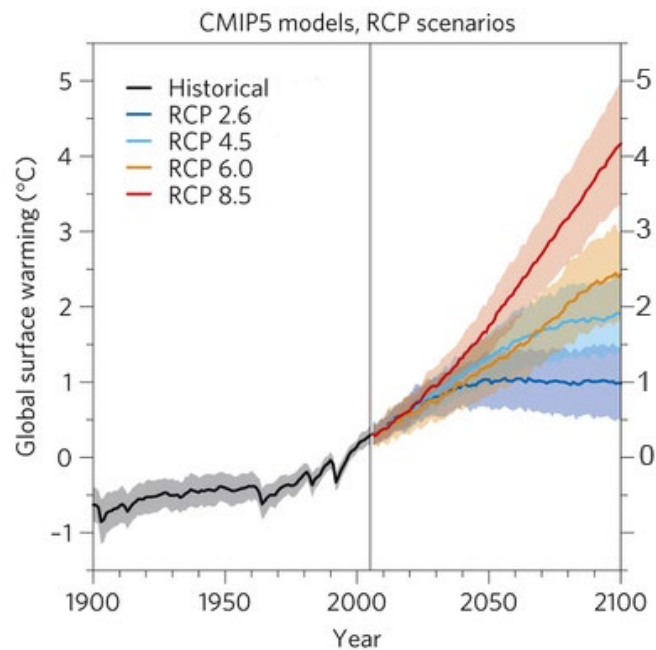


Figure 6. Projected global surface warming for different emissions scenarios⁸¹

The selected RCP scenario will have a more significant impact on projects with a longer design life or implemented in the second half of the 21st century. Considerations of risk and uncertainty should drive the selection of an RCP. For example, the highest emissions scenario, RCP 8.5, represents a more conservative analysis than lower emissions scenarios. Multiple RCPs may be chosen for a study to bracket the range of possible outcomes. If multiple scenarios are evaluated, they should be treated as independent outcomes and should not be aggregated or averaged.

5.3.2 GSI Types

In addition to standard GSI performance changing for a range of different precipitation outcomes, different GSI types may perform better or worse depending on regional climate trends. Guidance for identifying the GSI types or combinations (including with other types of stormwater management approaches) that provide increased climate resilience would be a valuable tool for communities.

Single GSI facilities that rely on fixed detention storage, for example, may fare worse than facilities that incorporate multiple treatment mechanisms (i.e., retention, infiltration, soil storage, evapotranspiration), especially in regionally wet/cool and wet/warm climates where rainfall intensity, duration and frequency may be more

dynamic or increase over time. In many regions, regardless of trends in heat and precipitation, multiple GSI facility types used together in a 'treatment-train' may provide more resilience than single facilities. Other potential options to increase GSI resilience to climate change impacts include using real-time control, adjustable outlet structures, stormwater capture and use, and GSI implemented with other large-scale nature-based solutions or cloudburst-type facilities.

5.3.3 GSI Hydraulic Components

Changes to the design and sizing of inlet, outlet, and overflow components may also be needed to adapt GSI facilities to climate change. As the hydrologic regime shifts, an inlet design that previously captured sufficient volume and flow may no longer do so. Similarly, if a facility must be designed to capture more intense or larger storms, underdrain sizing, outlet sizing, and overflow operations may also need to be revisited. Analyzing inlet, underdrain, and outlet performance with projected climate change can provide insight into potential design changes.

5.3.4 Media and Vegetation Considerations

Other GSI design components, such as media, vegetation, subsurface, liners, and structural elements may be affected by climate change and require additional design changes.

For example, media amendments (e.g., biochar) that encourage water retention while maintaining drawdown rates may be needed to sustain plant health as temperatures increase. Plant and tree species selection will need to adapt to more site-specific plant palettes that survive in harsh (including extreme dry and submerged) conditions in anticipation of rising temperatures and changing precipitation patterns, as well as potential changes in groundwater levels. Approved species lists by municipalities will need to take into consideration how climate change will affect plant hardiness zones. The shifting of those zones over time (projected by the US Forest Service)⁸² with rising temperatures and increased precipitation will need to be taken into account when designing vegetated systems to last many decades into the future.

In nearshore locations with shallow groundwater, future groundwater levels should be considered. These considerations will affect the design of a facility as well as specific features (e.g., whether a GSI facility should incorporate an impermeable

liner). Additional considerations include selecting appropriate plant palettes under future climate change and selecting appropriate media. Facility grades and hydrozone can be evaluated for optimizing plant health and selecting specific species for unique GSI configurations (i.e., stormwater planters with deeper uniform media vs. rain gardens with variable surface grades and elevations related to different hydrozones).

5.3.5 Additional Considerations for CSO Communities

CSO communities may require additional analysis to estimate the amount of upstream GSI-provided retention (e.g., infiltration) and detention needed to offset anticipated future runoff volume. The siting of upstream GSI and the volume provided may require adjustment to adequately prevent overflows given changing climate conditions.

5.3.6 GSI Facility Retrofit

The performance of existing GSI facilities may decline because of impacts of climate change. Declining performance could include but not be limited to:

1. Capture of a smaller proportion of average annual runoff or a smaller total volume, resulting in increased occurrence of bypass and less proportional or total treatment.
2. Erosion impacts to GSI facility surface or hydraulic components.
3. Other hydraulic issues such as extended ponding or flooding near inlet, outlet, or overflow with resultant vector issues.
4. Subsurface impacts, including groundwater intrusion into facility or export of pollutants to sensitive underlying groundwater basins; and/or
5. Poor vegetation survival.

Existing facilities may require re-analysis and retrofit of hydraulic components, installing a facility liner, replacing vegetation with better-suited species, enlarging facilities, or building additional facilities upstream or downstream.

5.4 Next Steps

Additional development of GSI design guidance in the context of climate resilience could be incorporated into future parts of this Guide. Potential future guidance topics are provided below.

5.4.1 Quantifying the Potential Extent of Climate Impacts to GSI

GSI design and retrofit changes needed for resilience can be further studied by examining the potential to mitigate the impacts of climate change and the extent of impacts on GSI facility performance. Comparing predicted future climate conditions to historical conditions and/or modeling GSI using a range of these conditions should be examined first. This analysis can provide insight into how the performance of existing GSI or GSI designed per current practices may be impacted.

GCMs could be identified for specific metropolitan areas, and their output could be examined for different RCPs compared to historical conditions (e.g., temperature and precipitation). Clear trends or changes identified through this comparison would provide high-level insight into potential GSI performance challenges. Developing more detailed GSI models incorporating regionally downscaled models would also provide more precise estimates of potential GSI performance issues.

5.4.2 Resilience of GSI Measures and Components

Using the results of the analysis described in section 5.4.1, or through literature studies, guidance could be developed to inform which designs or GSI measures are most resilient to anticipated climate changes. This could include a tool, such as a matrix or a flowchart, which identifies GSI measures and design changes (e.g., media amendments, facility liner, constructing facility off-line, etc.) that are best suited to manage specific climate impacts. This guidance could also be used as a planning tool once developed.

5.4.3 Methods to Develop New GSI Design Standards or Guidance

A technical and/or decision-making methodology for identifying the changes needed for GSI volume or hydraulic design could be developed. The proposed method would incorporate the range of estimated GSI performance changes leveraging existing tools at the local or regional level. This would result in the GSI sizing factors or

guidance that appropriately accounted for observed or projected changes in near-term precipitation and projected precipitation compared to long-term historic precipitation.

Additional analysis could be conducted to develop methods for changing existing design guidance for GSI components, including but not limited to:

1. Consideration of standards governing facility drawdown time and developing a method to examine potential impacts to drawdown with climate change.
2. Modeling analysis or methods to examine facility hydraulics (e.g., filtration rate, discharge rate) and associated performance changes for a range of drawdown times corresponding to different precipitation regime changes.
3. Developing factors or design changes to be incorporated into hydraulic components of facilities to address GSI performance modeling outcomes.
4. Quantifying uncertainty in design inputs.
5. Updating GSI plant palettes and resilient plant selection methods for different regions and their anticipated environmental changes. This could include guidance on hydrozone-specific plant placement geared towards specific GSI facility types to optimize vegetation health and facility resilience.

6. GSI OPERATIONS AND MAINTENANCE

This sections outlines considerations for GSI operations and maintenance (O&M) related to climate resilience and incorporating climate resilience into GSI O&M. Several climate impact drivers, including changes to temperature, precipitation, flood, rising sea, riverine, and groundwater levels, and changes to snow patterns could impact O&M.

6.1 Considerations for GSI Operations and Maintenance Related to Climate Resilience

Typical operations and maintenance (O&M) practices for GSI include routine and non-routine actions specific to each facility type. Examples of GSI O&M practices and their frequency include:

1. Frequent O&M needs: irrigation, plant maintenance, trash removal.
2. Post-storm O&M needs: Inspections to examine damage including erosion, standing water/drawdown issues, and needed rehabilitation.
3. Annual O&M needs: mulch replacement, clean out of hydraulic components (inlet, outlet, or underdrain), addressing fine sediment accumulation.
4. Infrequent O&M needs: scarification of the top layer of media, plant replacement, replacement of hydraulic or structural components, replacement of media/mulch.

Typical GSI O&M practices and frequency may require adjustment to maintain performance under future climate change. Potential changes to these activities could include:

1. Frequent O&M needs: more frequent, longer term, or higher volume of irrigation or more frequent plant maintenance needs due to higher temperatures and/or changing precipitation patterns.
2. Post-storm O&M needs: More frequent inspections or rehabilitation (e.g., increased erosion caused by higher intensity storms).
3. Annual O&M needs: deeper or more frequent mulch application, increased frequency of sediment removal, and maintenance of hydraulic components to account for increased erosion and flooding.

4. Infrequent O&M needs: Plant or plant palette replacement due to drought conditions; retrofit/replacement of hydraulic components; replacement of media to provide adjusted/needed filtration or drawdown rate.

In addition to the typical O&M practices listed, the impact of changes to regular maintenance practices of nearby infrastructure should be considered. This could include, for example, increased or different amounts of salt applied to adjacent roadways in response to snow and ice changes, or increased irrigation applied to adjacent landscaping in response to increased temperature. These adjacent O&M practices could generate runoff that may impact GSI facilities; responsive GSI O&M needs should be considered.

6.2 Incorporating Resilience into GSI O&M

To incorporate resilience into GSI, O&M programs should adapt as needed to keep pace with anticipated climate change, recognizing that severe impacts are often unpredictable and will occur more frequently.

6.2.1 Climate Change Education & Training

A critical component for adapting GSI O&M programs includes communication, education, and training of GSI maintenance staff and personnel. Staff should be made aware of policy changes relating to GSI and potential changes to GSI performance based on scientific studies or community-specific analysis. Staff communication should be bidirectional and encourage the reporting of anecdotal evidence or observations of potential climate-related impacts on GSI facilities. A communication plan including education and training of staff, along with obtaining input from staff, should be developed to support and inform adaptive management of O&M practices.

Community involvement can also be considered in the O&M phase. While some O&M tasks would require work by trained professionals (e.g., replacement of soil media or structural components), the local community and residents could do other tasks, such as plant maintenance and trash removal. This type of community buy-in would improve the potential for long-term success.

6.2.2 Adaptive Management

Adaptive management processes may require more frequent inspections to learn how enhanced O&M affects GSI performance. Over time, visual inspection data coupled with precipitation and temperature data could be used to examine trends in GSI performance with specific O&M practices; changes to those trends would indicate that updates to an O&M program are needed. Results from such an evaluation would be useful to identify staff or contractor training needs, tools, and resulting funding requirements. In addition, increasing temperatures may affect the health of maintenance staff, requiring schedule adjustments. A key component to adaptive management is a robust asset management strategy that can efficiently and consistently capture O&M-related data. Changes to asset management with consideration of climate resilience may also be needed.

6.3 Next Steps

Additional development of GSI O&M guidance in the context of climate resilience could be incorporated into future parts of this Guide. This could include:

1. Providing guidance on an education, training, and communication strategy that supports adaptive management of GSI O&M practices.
2. Developing a stepwise process for examining current maintenance practices and estimating the potential required changes with projected climate impacts. In addition to examining individual activities, the stepwise approach could include suggestions for exploring staffing, tools, and cost impacts.
3. Identifying key components of asset management tools that may require update to adequately track climate trends and impacts (e.g., better linkage with preceding storm size, geospatial data needs, plant health rating scales, etc.).

7. CLIMATE RESILIENCE RESOURCES GUIDE ROAD MAP – SUGGESTED NEXT STEPS

This Guide explores the intersection of GSI and climate change. It describes how GSI that is thoughtfully planned, designed, and implemented can be important for increasing resilience to climate risks, and climate change adaptation in the urban environment at a “broad brush level” and for a variety of future climate change impacts anticipated throughout North America. GSI is part of the range of solutions that can help manage urban flooding, erosion, and urban island heat impacts, and can also improve air quality, provide water supply augmentation, and provide ecosystem and human health benefits. Equitable implementation of GSI is more critical than ever, as vulnerable communities will feel climate change impacts first and worst, and GSI is often implemented when it is easy but not where it is needed most. Community engagement early and often, combined with meeting residents in their local communities, will improve the chances of long-term success.

GSI facilities are also vulnerable to climate change impacts. This Guide provides technical resources and considerations for improving the resilience of GSI planning, design, and implementation in the face of various climate change risks.

This Guide and its appendix of GSI-related climate resilience references are intended to be living documents for the GI Leadership Exchange to leverage for current use and to build from for future GSI program development as the science and community around resilience and GSI continues to evolve. Topics to consider for future additions to this Guide are outlined and prioritized below in Table 5.

Table 5. Prioritized Topics for Future Iterations of this Guide

Section	Next Step
Policy and Regulations	Methods for conducting risk assessment and scenario planning.
	Guidance for policy decision-making with uncertainty.
	Potential management questions in climate-resilient planning and design.
	Model policy language for climate resilience relating to GSI.
GSI Planning	Economic evaluation guidance relating to GSI.
	Guidance on decision-making processes to establish climate resilience priorities and goals, including community benefits and equity.
	Guidance on suggested data, indicators, and metrics to locate and prioritize GSI, as well as select GSI type.
	Guidance on geospatial processes to site GSI.
GSI Design	Evaluation framework to prioritize project opportunities.
	Quantifying the potential extent of climate impacts to GSI.
	Flowchart or tool to guide which designs or GSI measures are most resilient to anticipated climate changes.
GSI O&M	Methods to develop new GSI design standards or guidance.
	GSI O&M communication, education, and training strategy.
	Process to estimate potential required changes to maintenance activities, staffing, tools, and cost impacts.
	GSI O&M asset management guidance.

8. SOURCES CITED

- ¹ United States Environmental Protection Agency (USEPA). 2022. Why You Should Consider Green Stormwater Infrastructure for Your Community. Accessed on 15 April 2022. <https://www.epa.gov/G3/why-you-should-consider-green-stormwater-infrastructure-your-community>
- ² Center for Neighborhood Technology (CNT). 2010. The Value of Green Infrastructure. A Guide to Recognizing Its Economic, Environmental and Social Benefits. Accessed 18 April 2022. <https://cnt.org/publications/the-value-of-green-infrastructure-a-guide-to-recognizing-its-economic-environmental-and>
- ³ CNT. 2010.
- ⁴ USEPA. 2022.
- ⁵ National Oceanic and Atmospheric Administration (NOAA) Fisheries. 2022. Understanding Living Shorelines. <https://www.fisheries.noaa.gov/insight/understanding-living-shorelines>
- ⁶ Leatherman, S.P., K. Zhang, and B.C. Douglas. 2000. Sea level rise shown to drive coastal erosion. *Eos*, 81(6), 55–57. <https://doi.org/10.1029/00EO00034/ABSTRACT>
- ⁷ New York City Department of Environmental Protection. 2017. Cloudburst Resiliency Planning Study, Executive Summary. Prepared by Ramboll A/S. January.
- ⁸ Intergovernmental Panel on Climate Change (IPCC). 2021. Annex VII: Glossary [Matthews, J.B.R., V. Möller, R. van Diemen, J.S. Fuglestedt, V. Masson-Delmotte, C. Méndez, S. Semenov, A. Reisinger (eds.)]. In *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 2215–2256, doi:10.1017/9781009157896.022.
- ⁹ IPCC. 2021.
- ¹⁰ IPCC. 2021.
- ¹¹ Arias, P.A., N. Bellouin, E. Coppola, R.G. Jones, G. Krinner, J. Marotzke, V. Naik, M.D. Palmer, G.-K. Plattner, J. Rogelj, M. Rojas, J. Sillmann, T. Storelvmo, P.W. Thorne, B. Trewin, K. Achuta Rao, B. Adhikary, R.P. Allan, K. Armour, G. Bala, R. Barimalala, S. Berger, J.G. Canadell, C. Cassou, A. Cherchi, W. Collins, W.D. Collins, S.L. Connors, S. Corti, F. Cruz, F.J. Dentener, C. Dereczynski, A. Di Luca, A. Diongue Niang, F.J. Doblas-Reyes, A. Dosio, H. Douville, F. Engelbrecht, V. Eyring, E. Fischer, P. Forster, B. Fox-Kemper, J.S. Fuglestedt, J.C. Fyfe, N.P. Gillett, L. Goldfarb, I. Gorodetskaya, J.M. Gutierrez, R. Hamdi, E. Hawkins, H.T. Hewitt, P. Hope, A.S. Islam, C. Jones, D.S. Kaufman, R.E. Kopp, Y. Kosaka, J. Kossin, S. Krakovska, J.-Y. Lee, J. Li, T. Mauritsen, T.K. Maycock, M. Meinshausen, S.-K. Min, P.M.S. Monteiro, T. Ngo-Duc, F. Otto, I. Pinto, A. Pirani, K. Raghavan, R. Ranasinghe, A.C. Ruane, L. Ruiz, J.-B. Sallée, B.H. Samset, S. Sathyendranath, S.I.

- Seneviratne, A.A. Sörensson, S. Szopa, I. Takayabu, A.-M. Tréguier, B. van den Hurk, R. Vautard, K. von Schuckmann, S. Zaehle, X. Zhang, and K. Zickfeld. 2021. Technical Summary. In *Climate Change 2021: The Physical Science Basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change* [Masson-Delmotte, V., P. Zhai, A. Pirani, S.L. Connors, C. Péan, S. Berger, N. Caud, Y. Chen, L. Goldfarb, M.I. Gomis, M. Huang, K. Leitzell, E. Lonnoy, J.B.R. Matthews, T.K. Maycock, T. Waterfield, O. Yelekçi, R. Yu, and B. Zhou (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA, pp. 33–144. doi:10.1017/9781009157896.002.
- ¹² Arias et al. 2021.
- ¹³ National Research Council. 2010. *Adapting to the Impacts Of Climate Change*. Washington, DC: The National Academies Press. <https://doi.org/10.17226/12783>
- ¹⁴ Jantarasami, L., R. Novak, R. Delgado, C. Narducci, E. Marino, S. McNeeley, J. Raymond-Yakoubian, L. Singletary, and K. Powys Whyte. 2018. Chapter 15: Tribal and Indigenous Communities. *Impacts, Risks, and Adaptation in the United States: The Fourth National Climate Assessment, Volume II*. <https://doi.org/10.7930/NCA4.2018.CH15>
- ¹⁵ Norton-Smith, K., K. Lynn, K. Chief, K. Cozzetto, J. Donatuto, M. Hiza Redsteer, L.E. Kruger, J. Maldonado, C. Viles, and K.P. Whyte. 2016. Climate change and indigenous peoples: a synthesis of current impacts and experiences. <https://doi.org/10.2737/PNW-GTR-944>
- ¹⁶ Roth, M. 2018. A resilient community is one that includes and protects everyone. *Bulletin of the Atomic Scientists*, 74(2), 91–94. <https://doi.org/10.1080/00963402.2018.1436808>
- ¹⁷ Gutierrez, K., and C. LePrevost. 2016. Climate Justice in Rural Southeastern United States: A Review of Climate Change Impacts and Effects on Human Health. *International Journal of Environmental Research and Public Health*, 13(2), 189. <https://doi.org/10.3390/ijerph13020189>
- ¹⁸ Gutierrez and LePrevost. 2016.
- ¹⁹ Anderson, A.S., A.E. Reside, J.J. VanDerWal, L.P. Shoo, R.G. Pearson, and S.E. Williams. 2012. Immigrants and refugees: the importance of dispersal in mediating biotic attrition under climate change. *Global Change Biology*, 18(7), 2126–2134. <https://doi.org/10.1111/j.1365-2486.2012.02683.x>
- ²⁰ Crozier, L.G., and J.A. Hutchings. 2014. Plastic and evolutionary responses to climate change in fish. *Evolutionary Applications*, 7(1), 68–87. <https://doi.org/10.1111/eva.12135>
- ²¹ Franks, S.J., J.J. Weber, and S.N. Aitken. 2014. Evolutionary and plastic responses to climate change in terrestrial plant populations. *Evolutionary Applications*, 7(1), 123–139. <https://doi.org/10.1111/eva.12112>
- ²² Hoffmann, A.A., and C.M. Sgrò. 2011. Climate change and evolutionary adaptation. *Nature*, 470(7335), 479–485. <https://doi.org/10.1038/nature09670>

-
- ²³ Pinsky, M.L., B. Worm, M.J. Fogarty, J.L. Sarmiento, and S.A. Levin. 2013. Marine Taxa Track Local Climate Velocities. *Science*, 341(6151), 1239–1242. <https://doi.org/10.1126/science.1239352>
- ²⁴ Thomas, A.C., A.J. Pershing, K.D. Friedland, J.A. Nye, K.E. Mills, M.A. Alexander, N.R. Record, R. Weatherbee, and M.E. Henderson. 2017. Seasonal trends and phenology shifts in sea surface temperature on the North American northeastern continental shelf. *Elementa: Science of the Anthropocene*, 5. <https://doi.org/10.1525/elementa.240>
- ²⁵ Mellin, C., M. Lurgi, S. Matthews, M.A. MacNeil, M.J. Caley, N. Bax, R. Przeslawski, and D.A. Fordham. 2016. Forecasting marine invasions under climate change: Biotic interactions and demographic processes matter. *Biological Conservation*, 204, 459–467. <https://doi.org/10.1016/j.biocon.2016.11.008>
- ²⁶ Román-Palacios, C., and J.J. Wiens. 2020. Recent responses to climate change reveal the drivers of species extinction and survival. *Proceedings of the National Academy of Sciences*, 117(8), 4211–4217. <https://doi.org/10.1073/pnas.1913007117>
- ²⁷ Rizwan, A.M., L.Y.C. Dennis, and C. Liu. 2008. A review on the generation, determination and mitigation of Urban Heat Island. *Journal of Environmental Sciences*, 20(1), 120–128. [https://doi.org/10.1016/S1001-0742\(08\)60019-4](https://doi.org/10.1016/S1001-0742(08)60019-4)
- ²⁸ Hibbard, K.A., F.M. Hoffman, D. Huntzinger, and T.O. West. 2017. Ch. 10: Changes in Land Cover and Terrestrial Biogeochemistry. *Climate Science Special Report: Fourth National Climate Assessment, Volume I*. <https://doi.org/10.7930/J0416V6X>
- ²⁹ Wehner, M.F., J.R. Arnold, T. Knutson, K.E. Kunkel, and A.N. LeGrande. 2017. Ch. 8: Droughts, Floods, and Wildfires. *Climate Science Special Report: Fourth National Climate Assessment, Volume I*. <https://doi.org/10.7930/J0CJ8BNN>
- ³⁰ National Oceanic and Atmospheric Administration (NOAA). 2022. U.S. Climate Resilience Toolkit. <https://toolkit.climate.gov/>
- ³¹ Shafique, M., and K. Reeho. 2017. Green stormwater infrastructure with low impact development concept: a review of current research. <https://doi.org/10.5004/dwt.2017.20981>
- ³² USEPA. 2022.
- ³³ Johnson, D., J. Exl, and S. Geisendorf. 2021. The Potential of Stormwater Management in Addressing the Urban Heat Island Effect: An Economic Valuation. <https://doi.org/10.3390/su13168685>
- ³⁴ Zölch, T., J. Maderspacher, C. Wamsler, and S. Pauleit. 2016. Using green infrastructure for urban climate-proofing: An evaluation of heat mitigation measures at the micro-scale. *Urban Forestry & Urban Greening*, 20, 305–316. <https://doi.org/10.1016/j.UFUG.2016.09.011>
- ³⁵ Johnson et al. 2021.
- ³⁶ Hunter Block, A., S.J. Livesley, and N.S.G. Williams. 2012. Responding to the urban heat island: a review of the potential of green infrastructure. <https://www.semanticscholar.org/paper/Responding-to-the-urban-heat-island%3A-a-review-of-of-Block-Livesley/c9307c609b485e4c148564a17fa697a9920c54c1>

-
- ³⁷ Hewitt, C.N., K. Ashworth, and A.R. Mackenzie. 2020. Using green infrastructure to improve urban air quality (GI4AQ). *Ambio*, 49. <https://doi.org/10.1007/s13280-019-01164-3>
- ³⁸ Neft, I., M. Scungio, N. Culver, and S. Singh. 2016. Simulations of aerosol filtration by vegetation: Validation of existing models with available lab data and application to near-roadway scenario. *Aerosol Science and Technology*, 50(9), 937–946. https://doi.org/10.1080/02786826.2016.1206653/SUPPL_FILE/UAST_A_1206653_SM3755.ZIP
- ³⁹ Hewitt et al. 2020.
- ⁴⁰ Natural Resources Defense Council. 2009. Water Efficiency Saves Energy: Reducing Global Warming Pollution Through Water Use Strategies. www.nrdc.org/policy
- ⁴¹ National Academies. 2019. Beneficial Use of Graywater and Stormwater An Assessment of Risks Costs and Benefits | National Academies. <https://www.nationalacademies.org/our-work/beneficial-use-of-graywater-and-stormwater-an-assessment-of-risks-costs-and-benefits>
- ⁴² City of South San Francisco and Lotus Water. 2021. Orange Memorial Park Storm Water Capture Project. Proceedings of “CASQA Stormwater Capture and Use: Making it Happen” Meeting. 15 April.
- ⁴³ Suppakittpaisarn, P., X. Jiang, and W.C. Sullivan. 2017. Green Infrastructure, Green Stormwater Infrastructure, and Human Health: A Review. *Current Landscape Ecology Reports*, 2(4), 96–110. <https://doi.org/10.1007/s40823-017-0028-y>
- ⁴⁴ Green Schoolyards America. 2022. Accessed on 21 June 2022. <https://www.greenschoolyards.org/>
- ⁴⁵ Suppakittpaisam et al. 2017.
- ⁴⁶ Kuo, L.E., M. Czarnecka, J.B. Kitlinska, J.U. Tilan, R. Kvetansk, and Z. Zukowska. 2008. Chronic Stress, Combined with a High-Fat/High-Sugar Diet, Shifts Sympathetic Signaling toward Neuropeptide Y and Leads to Obesity and the Metabolic Syndrome. *Annals of the New York Academy of Sciences*, 1148(1), 232–237. <https://doi.org/10.1196/annals.1410.035>
- ⁴⁷ Nutsford, D., A.L. Pearson, and S. Kingham. 2013. An ecological study investigating the association between access to urban green space and mental health. *Public Health*, 127(11), 1005–1011. <https://doi.org/10.1016/J.PUHE.2013.08.016>
- ⁴⁸ Taylor, M.S., B.W. Wheeler, M.P. White, T. Economou, and N.J. Osborne. 2015. Research note: Urban street tree density and antidepressant prescription rates—A cross-sectional study in London, UK. *Landscape and Urban Planning*, 136, 174–179. <https://doi.org/10.1016/J.LANDURBPLAN.2014.12.005>
- ⁴⁹ Troy, A., J. Morgan Grove, and J. O’Neil-Dunne. 2012. The relationship between tree canopy and crime rates across an urban–rural gradient in the greater Baltimore region. *Landscape and Urban Planning*, 106(3), 262–270. <https://doi.org/10.1016/J.LANDURBPLAN.2012.03.010>
- ⁵⁰ Kaplan, R., and S. Kaplan. 1989. The Experience of Nature A Psychological Perspective.

-
- ⁵¹ Kondo, M.C., S.C. Low, J. Henning, and C.C. Branas. 2015. The impact of green stormwater infrastructure installation on surrounding health and safety. *American Journal of Public Health*, 105(3), e114–e121. <https://doi.org/10.2105/AJPH.2014.302314>
- ⁵² Lee, K.E., K.J.H. Williams, L.D. Sargent, N.S.G. Williams, and K.A. Johnson. 2015. 40-second green roof views sustain attention: The role of micro-breaks in attention restoration. *Journal of Environmental Psychology*, 42, 182–189. <https://doi.org/10.1016/J.JENVP.2015.04.003>
- ⁵³ City of Philadelphia, Office of Sustainability. 2021. Philadelphia Climate Action Playbook. January. Accessed 8 March 2022. <https://www.phila.gov/media/20210113125627/Philadelphia-Climate-Action-Playbook.pdf>
- ⁵⁴ McDonald, R.I., T. Biswas, C. Sachar, I. Housman, T.M. Boucher, D. Balk, D. Nowak, E. Spotswood, C.K. Stanley, and S. Leyk. 2021. The tree cover and temperature disparity in US urbanized areas: Quantifying the association with income across 5,723 communities. *PLoS One* Apr 28, 16(4): e0249715. <https://doi.org/10.1371/journal.pone.0249715>
- ⁵⁵ McDonald et al. 2021.
- ⁵⁶ Roth. 2018.
- ⁵⁷ City/County Association of Governments (C/CAG) of San Mateo County and Caltrans. 2021. San Mateo Countywide Sustainable Streets Master Plan. January. Accessed 27 January 2022. <https://ccag.ca.gov/countywide-sustainable-streets-master-plan/>
- ⁵⁸ Green Infrastructure Leadership Exchange and Greenprint Partners. 2022. Equity Guide for Green Stormwater Infrastructure Practitioners. March. Accessed on 8 April 2022. https://giexchange.org/wp-content/uploads/2022/03/Equity-Guide-for-GSI-Practitioners_March-2022-1.pdf
- ⁵⁹ Green Infrastructure Leadership Exchange and Greenprint Partners. 2022.
- ⁶⁰ National Oceanic and Atmospheric Administration and the Water Research Foundation. 2020. "Filling in the Gaps: Climate and Weather Information for Small and Medium-Size Water Utilities." NOAA Workshop Series. Accessed on 31 January 2022. <https://cpo.noaa.gov/Divisions-Programs/Climate-and-Societal-Interactions/Water-Resources/Water-Utility-Study>
- ⁶¹ United State. Water Alliance. 2017. An Equitable Water Future, A National Briefing Paper. Accessed 8 April 2022. http://uswateralliance.org/sites/uswateralliance.org/files/publications/uswa_water-equity_FINAL.pdf
- ⁶² Green Infrastructure Leadership Exchange and Greenprint Partners. 2022.
- ⁶³ National Oceanic and Atmospheric Administration and the Water Research Foundation. 2020.
- ⁶⁴ California Regional Water Quality Control Board, San Francisco Bay Region. 2022. Municipal Regional Stormwater NPDES Permit. Order No. R2-2022-0018. NPDES Permit No. CAS612008. 11 May. https://www.waterboards.ca.gov/rwqcb2/water_issues/programs/stormwater/MRP/mrp5-22/R2-2022-0018.pdf

-
- ⁶⁵ Sustainable Property. 2016. New Solutions for Sustainable Stormwater Management in Canada, Report. September. <https://institute.smartprosperity.ca/sites/default/files/stormwaterreport.pdf>
- ⁶⁶ City of Toronto. 2021. Toronto Green Standard Version 4 Adopted by Toronto City Council. Issued 30 July. <https://www.toronto.ca/wp-content/uploads/2021/08/8d47-CityPlanningTGSNoticev4.pdf>
- ⁶⁷ State of California. 2021. Governor Newsom Signs Climate Action Bills, Outlines Historic \$15 Billion Package to Tackle the Climate Crisis and Protect Vulnerable Communities. Office of Governor Gavin Newsom. 23 September. <https://www.gov.ca.gov/2021/09/23/governor-newsom-signs-climate-action-bills-outlines-historic-15-billion-package-to-tackle-the-climate-crisis-and-protect-vulnerable-communities/>
- ⁶⁸ Jackisch, N., and M. Weiler. 2017. The hydrologic outcome of a Low Impact Development (LID) site including superposition with streamflow peaks. *Urban Water Journal*, 14(2), 143–159. <https://doi.org/10.1080/1573062X.2015.1080735>
- ⁶⁹ Sohn, W., J.H. Kim, M.H. Li, and R. Brown. 2019. The influence of climate on the effectiveness of low impact development: A systematic review. In *Journal of Environmental Management* (Vol. 236). <https://doi.org/10.1016/j.jenvman.2018.11.041>
- ⁷⁰ Schueler, T.R. 1987. *Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs*. Department of Environmental Programs, Metropolitan Washington Council of Governments. July.
- ⁷¹ Schueler. 1987.
- ⁷² County of Los Angeles Department of Public Works. 2014. *Low Impact Development: Standards Manual*. February. https://dpw.lacounty.gov/idd/iddservices/docs/Low_Impact_Development_Standards_Manual.pdf
- ⁷³ California Association of Stormwater Quality Agencies (CASQA). 2003. *Stormwater Best Management Practice Handbook - New Development and Redevelopment*. January. Accessed 27 January 2022. https://www.casqa.org/sites/default/files/BMPHandbooks/BMP_NewDevRedev_Complete.pdf
- ⁷⁴ CASQA. 2003.
- ⁷⁵ Jackisch and Weiler. 2017.
- ⁷⁶ Nilsen, C. 2020. How climate change may influence stormwater runoff: Insights from the Puget Sound Stormwater Heatmap. Presentation. 10 September. https://github.com/cnilsen/nebc-conference-2020/blob/55b70e7fa6eff3c1b51d8b031eda4d2964f8a663/Nilsen_NEBC_Stormwater_2020_out.pdf
- ⁷⁷ Walsh, J., D. Wuebbles, K. Hayhoe, J. Kossin, K. Kunkel, G. Stephens, P. Thorne, R. Vose, M. Wehner, J. Willis, D. Anderson, S. Doney, R. Feely, P. Hennon, V. Kharin, T. Knutson, F. Landerer, T. Lenton, J. Kennedy, and R. Somerville, 2014: Ch. 2: Our Changing Climate. *Climate Change*

Impacts in the United States: The Third National Climate Assessment, J. M. Melillo, Terese (T.C.) Richmond, and G. W. Yohe, Eds., U.S. Global Change Research Program, 19-67. doi:10.7930/J0KW5CXT. Figure 2-18. <https://nca2014.globalchange.gov/report/our-changing-climate/heavy-downpours-increasing#graphic-16693>

⁷⁸ Lewellyn, C., C.E. Lyons, R.G. Traver, and B.M. Wadzuk. 2016. Evaluation of Seasonal and Large Storm Runoff Volume Capture of an Infiltration Green Infrastructure System. *Journal of Hydrologic Engineering*, 21(1), 04015047. [https://doi.org/10.1061/\(ASCE\)HE.1943-5584.0001257](https://doi.org/10.1061/(ASCE)HE.1943-5584.0001257)

⁷⁹ Emerson, C.H., and R.G. Traver. 2008. Multiyear and Seasonal Variation of Infiltration from Storm-Water Best Management Practices. *Journal of Irrigation and Drainage Engineering*, 134(5), 598–605. [https://doi.org/10.1061/\(ASCE\)0733-9437\(2008\)134:5\(598\)](https://doi.org/10.1061/(ASCE)0733-9437(2008)134:5(598))

⁸⁰ Adapted from IPCC. 2014. *Climate Change 2014: Synthesis Report. Contribution of Working Groups I, II and III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change* [Core Writing Team, R.K. Pachauri and L.A. Meyer (eds.)]. IPCC, Geneva, Switzerland. 151 pp.

⁸¹ IPCC. 2014.

⁸² United States Department of Agriculture. n.d. Shifts in Growing Degree Days, Plant Hardiness Zones and Heat Zones. <https://www.climatehubs.usda.gov/hubs/northern-forests/topic/shifts-growing-degree-days-plant-hardiness-zones-and-heat-zones>

APPENDIX A
Matrix of Existing GSI Resilience Resources

Matrix 1. State of the Science: Resources Exploring the Intersection of Green Stormwater Infrastructure and Climate Change																	
Title	Year	Author(s)	Resource Type	Priority Item (1 to 5)	Green Stormwater Infrastructure		Climate Change Impact								Focus on Equity	Web Link	Brief Summary
					Mention of GSI	Focus on GSI	Urban Heat	Precip	Snow-fall	Sea Level/Lake/ Riverine Rise	Water Stress	Bio-diversity	Tree/ Green Equity	Air Quality			
Milwaukee Metropolitan Sewerage District: Regional Infrastructure Plan	2013	Milwaukee Metropolitan Sewerage District	Plan	2	X	X		X					X		https://www.mmsd.com/what-we-do/green-infrastructure/resources/regional-green-infrastructure-plan	Milwaukee's green infrastructure plan; The "Green Infrastructure Benefits and Costs" section detailed the triple-bottom-line analysis (sustainable development).	
San Mateo Countywide Sustainable Streets Master Plan	2021	C/CAG & Caltrans	Plan	2	X	X		X							https://cag.ca.gov/countywide-sustainable-streets-master-plan/	General guideline on sustainable streets for San Mateo County.	
EPA: Green Infrastructure for Climate Resiliency	2021	EPA	Website	2	X	X	X	X		X	X	X			https://www.epa.gov/green-infrastructure/green-infrastructure-climate-resiliency	General information how GSI can help build climate resiliency.	
Philadelphia Water Department: Green City Clean Waters	2011	Philadelphia Water Department	Plan	2	X		X	X		X	X	X	X		https://water.phila.gov/green-city/	Philadelphia's Green City Clean Waters program, a 25-year plan to reduce the volume of stormwater entering combined sewers using green infrastructure and to expand stormwater treatment capacity with traditional infrastructure improvements.	
City of Portland and Multnomah County Climate Action Plan	2015	City of Portland / Multnomah County	Plan	2	X		X	X	X						https://www.portland.gov/bps/climate-action/history-and-key-documents#toc-resiliency-and-preparation	Portland's climate action plan	
Green Infrastructure and Climate Change Collaborating to Improve Community Resiliency	2016	EPA / Office of Wastewater Management	Report	2	X	X	X	X					X		https://www.epa.gov/sites/default/files/2016-08/documents/gi_climate_charrettes_final.pdf	EPA convened charrettes, or intensive planning sessions in Albuquerque, Grand Rapids, Los Angeles, and New Orleans, to explore the ways in which green infrastructure could help cities become more resilient to climate change. Four different case studies are shown.	
Reducing Damage from Localized Flooding - A Guide for Communities (FEMA)	2005	FEMA	Guide	2	X	X		X							https://www.fema.gov/pdf/fima/FEMA511-complete.pdf	FEMA's guide on reducing damage from localized flooding. GSI is suggested throughout the guide.	
Developing the evidence base for mainstreaming adaptation of stormwater systems to climate change	2012	Gersonius et al.	Journal Article	3, 4, 5	X												The study introduced the mainstreaming method that can help enhance the understanding of the adaptive potential of stormwater systems.
Incorporating climate change into culvert design in Washington State, USA	2017	Wilhere et al.	Journal Article	3	X												Test culvert designs based on potential climate change impacts.
Flood loss avoidance benefits of green infrastructure for stormwater management	2015	Atkins & EPA	Report	2,3,4	X	X		X							https://www.epa.gov/green-infrastructure/flood-loss-avoidance-benefits-green-infrastructure-stormwater-management	This study generated an estimate of the monetary value of flood loss avoidance that could be achieved by using GSI; FEMA flood loss estimation model Hazus.	
Economic assessment of green infrastructure strategies for climate change adaptation: Pilot studies in the Great Lakes Region	2014	Eastern Research Group, Inc & NOAA	Report	2,3,4	X	X		X							https://coast.noaa.gov/data/digitalcoast/pdf/climate-change-adaptation-pilot.pdf	The purpose of this study was to assess the economic benefits of green infrastructure (GI) as a method of reducing the negative effects of flooding in Duluth, Minnesota, and Toledo, Ohio. A secondary purpose of the study was to develop an analytical framework that can be applied in other communities to 1) consider and estimate predicted changes in future precipitation, 2) assess how their community may be impacted by flooding with increased precipitation, 3) consider the range of available green infrastructure and land use policy options to reduce flooding, and 4) identify the benefits (as well as co-benefits) that can be realized by implementing GI.	
Arid green infrastructure for water control and conservation; State of the science and research needs for arid/semi-arid regions	2016	EPA	Report	2	X	X							X		https://www.epa.gov/sites/default/files/2016-08/documents/gi_climate_charrettes_final.pdf	BMPs in arid and semi-arid regions; Policy initiatives and guidance to address drought and water sustainability through green infrastructure; current research in the application of GSI in arid and semi-arid regions.	
The value of green infrastructure for urban climate adaptation	2011	The Center for Clean Air Policy	Report	2	X	X	X	X					X		https://www.savetherain.us/	This report showed how each type of green infrastructure can help combat certain climate change impacts. It also suggested strategies for implementing each GI.	
Smart Policies for a Changing Climate: The Report and Recommendations of the ASLA Blue Ribbon Panel on Climate Change and Resilience	2018	American Society of Landscape Architects	Report	2, 4	X									X		The report provides design and planning solutions together with policy recommendations for five different areas (natural systems, community development, vulnerable communities, transportation, and agriculture) that are important to building climate resilient community.	
Green Infrastructure for Climate Resiliency	2014	EPA / Office of Water	Brochure	1, 2	X	X	X	X		X	X					The brochure summarizes the climate change effects on cities and how GSI can help prepare cities to be resilient against flooding, drought, coastal damage and erosion, energy consumption, and urban heat island effect.	
An Equity Review of the City of Calgary's Climate Resilience Strategy	2021	Toronto Environmental	Report	2									X	X		Equity-focused review of the Calgary Resilience Strategy: Mitigation and Adaptation Action Plans and provide support to the city as it undertakes an update of this strategy.	
Climate Change and Stormwater in Portland, Gresham, and Clackamas County	2021	UW Climate Impacts Group	Report		X			X								The purpose of this project was to develop projections of 21st century changes in precipitation that can be used to inform stormwater and wastewater management in the cities of Portland, Gresham, and Clackamas County. Use global circulation models to predict future precipitation.	
BES Resiliency Master Plan and Climate Change Planning for CIP Projects	2017	Jennifer Belknap Williamson; Bureau of Environmental Services	Workshop	2	X		X	X								The pdf is a presentation on the resiliency master plan and climate change planning for CIP projects in Portland.	
The Effects of Climate Change on Lake Tahoe in the 21st Century: Meteorology, Hydrology, Loading and Lake Response	2010	Tahoe Environmental Science Center	Report		X			X								The study examines the potential effects of changing meteorologic conditions (future air temp, amount and type of precipitation, stream discharge, sediment and nutrient loading characteristics, BMP performance, lake mixing and water quality response) using existing water resource models developed for the Lake Tahoe TMDL.	
An Enhanced Climate-Related Risks and Opportunities Framework and Guidebook for Water Utilities Preparing for a Changing Climate	2021	Water Utility Climate Alliance	Report	2, 3, 4, 5	X											This is a supplement to the "Mapping Climate-related Risks and Opportunities to Water Utility Business Functions Framework" intended for water utility business function leads to use as they begin to assess the climate-related risk and opportunities associated with their critical business functions.	
Re-imagining design storm criteria for the challenges of the 21st century	2020	Markolf et al.	Journal Article	3	X	X		X								This paper seeks to identify design practices and strategies that are well-suited for the increasingly complex and rapidly changing contexts (climate change and increasing complexity of our urban systems) in which our cities and infrastructure are operating. As the conclusion, at the scale of single components/sub-systems, return periods (or similar criteria) will likely remain a necessary element of the design process. At the scale of entire system(s), approaches like safe-to-fail, robust decision making, and enhanced sensing and simulation might be more suitable.	

Matrix 1. State of the Science: Resources Exploring the Intersection of Green Stormwater Infrastructure and Climate Change																	
Title	Year	Author(s)	Resource Type	Priority Item (1 to 5)	Green Stormwater Infrastructure		Climate Change Impact								Focus on Equity	Web Link	Brief Summary
					Mention of GSI	Focus on GSI	Urban Heat	Precip	Snow-fall	Sea Level/Lake/ Riverine Rise	Water Stress	Bio-diversity	Tree/ Green Equity	Air Quality			
Is green infrastructure a viable strategy for managing urban surface water flooding?	2020	Webber et al.	Journal Article	2	X	X		X									This paper seeks to understand the effectiveness of GI on intervene surface water flooding. As the result, intensive application of GI could substantially reduce flood depth and velocity in the catchment but that residual risk remains, particularly during extreme flood events. The best performing intervention strategy in the study area was found to be catchment-wide decentralized rainwater capture.
Making Nature's City: A science-based framework for building urban biodiversity	2019	San Francisco Estuary Institute	Report	5	X	X							X				The report synthesizes global research to develop a science-based approach for supporting nature in cities. It identifies seven key elements of urban form and function that work together to maximize biodiversity. The elements are shown through a case study in Silicon Valley.
What is the role of GSI in managing extreme precipitation events?	2020	McPhillips et al.	Journal Article	2, 3, 4	X	X		X									This paper reviewed GSI design storm requirements for the seven Urban Resilience to Extremes Sustainability Research Network cities in the United States (Atlanta, Baltimore, Miami, New York, Phoenix, Portland, Syracuse). The results indicate that GSI in most of the study cities are designed for smaller, more common precipitation events (1-year storm) considered by current water quality regulations. For GSI to contribute to climate change adaptation, it is critical to ensure that design guidelines align with that goal.
NOAA workshop series on improving climate and weather information delivery for small- to medium-size water systems to help build climate resilience (includes 4 resources: brochure, workshop, project summary and appendices)	2020	NOAA	Workshop	3, 4, 5				X	X			X		X			This workshop series aim to improve the delivery of climate and weather information resources for small- to medium- size water systems with the goal of building their resilience to climate change. It has a specific section about equity.
Building Urban Stormwater Resiliency by Incorporating Global Climate Change Projections to Local Runoff Modeling	2021	CASQA/2ndNature	Workshop	3	X	X		X							Building Urban Stormwater Resiliency by Incorporating Global Climate Change Projections to Local Runoff Modeling CASQA - California Stormwater Quality Association	This presentation illustrates the process of incorporating climate change projections to a stormwater model designed for direct use by stormwater managers to inform GSI implementation planning and design.	
The tree cover and temperature disparity in US urbanized areas: Quantifying the association with income across 5,723 communities	2021	McDonald et al.	Journal Article	2	X								X	X			In 92% of the urbanized areas surveyed, low-income blocks have less tree cover than high-income blocks. On average, low-income blocks have 15.2% less tree cover and are 1.5C hotter than high-income blocks.
Simulated sensitivity of urban green infrastructure practices to climate change	2018	Sarkar et al.	Journal Article	2, 3	X	X		X				X	X				This paper used the Regional Hydro-Ecologic Simulation System (a hydrologic and biogeochemical watershed model) to investigate sensitivity of different GI practices to climate changes.
Life cycle assessment of stormwater management in the context of climate change adaptation	2016	Brudler et al.	Journal Article	2, 3	X	X		X									Compared a stormwater management system (combined GSI and local retention measures with planned stormwater routing) with a traditional, sub-surface approach through life cycle assessment. Showed that the adaption plan has lower impacts than the traditional alternative.
Multiobjective optimization of low impact development stormwater controls	2018	Eckart et al.	Journal Article	4, 5	X	X											This paper introduces a coupled optimization-simulation model that links SWMM to the Borg Multi-Objective Evolutionary Algorithm. The coupled model is used to identify the optimal combination of LID controls.
Assessment of low impact development for managing stormwater with changing precipitation due to climate change	2011	Pyke et al.	Journal Article	2	X	X		X									This study considers the potential effectiveness of LID for reducing stormwater impacts on surface water under changing precipitation patterns. Results suggests LID help increasing resilience of communities to changing precipitation patterns.
Potential climate change impacts on green infrastructure vegetation	2016	Catalano de Sousa et al.	Journal Article	2	X	X		X				X					This study investigates the impacts of successive simulated droughts and floods on two plant species commonly installed in green infrastructure sites built in the urban NE USA.
Using rainfall measures to evaluate hydrologic performance of green infrastructure systems under climate change	2021	Cook et al.	Journal Article	2,3	X	X		X									The study suggests that performance of GSI under climate changes can be tracked by using annual rainfall measures (e.g. max daily rainfall per year).
Planning, Designing, Operating, and Maintaining Local Infrastructure in a Changing Climate (includes 4 resources: toolkit, project overview, presentation, and guide)	2021	Baltimore Metropolitan Council & Baltimore Regional Transportation Board	Report & Toolkit	2, 5	X			X			X						Resource guide for departments of public works and transportation in the Baltimore region on potential future climate changes impacts and adaptation strategies and toolkits.
Colma Creek Hydrology and Hydraulic Modeling Analysis	2021	Paradigm Environmental & Northwest Hydraulic Consultants	Report	3, 4, 5	X	X		X			X						The report summarizes the results of hydraulic models of Colma Creek (SF Bay Area) under future climate conditions. Climate change causes higher intensity storms and increases flood risk. GI can mitigate the effects of smaller, more frequent storm events. Current 100-year storm with sea level rise also presents a major risk.
Is Green Infrastructure a Universal Good?	2022	Cary Institute of Ecosystem Studies / Urban Systems Lab	Website	2	X	X							X	X	GI Equity	This project aims to examine the equity of green infrastructure in the urban planning process. The major findings state that over 90% of city plans seek to rearrange the values and hazards of urban landscapes affecting the distributional equity of GI. However, only one in four city plans discusses equity issues. Very few cities acknowledge the potential negative impacts of uneven or disproportionate investment in greening, like green gentrification.	
State of Equity Practice in Public Sector: Green Stormwater Infrastructure	2021	The Green Infrastructure Leadership Exchange	Report	2	X	X							X	X	https://giexchange.org/wp-content/uploads/2022/01/State-of-Equity-in-Public-Sector-GSI-Baseline-Report-FINAL.pdf	This report aims to help better understand the extent to which GSI leaders in the public sector are incorporating equity best practices into their work.	
Communities and Utilities Partnering for Water Resilience	2022	EPA	Website	3, 4, 5	X										Communities and Utilities Partnering for Water Resilience US EPA	EPA website on building water resilience in general.	
Climate Change and Water Tools	2022	EPA	Toolkit	3, 4, 5	X										Climate Change and Water Tools US EPA	EPA website on tools for building resilient water utilities including general adaptation strategy guide, maps, and case studies.	
Build Flood Resilience at Your Water Utility	2022	EPA	Toolkit	3, 4,5				X				X			Build Flood Resilience at Your Water Utility US EPA	EPA website on providing tools for building flood resilience.	
WaterNow Alliance: Tap Into Resilience	2022	WaterNow Alliance	Website	3, 4, 5	X										Tap into Resilience from WaterNow Alliance	WaterNow Alliance's initiative on providing water leaders nationwide with tools and inspiration to scale investment in sustainable, localized water infrastructure.	
Georgetown Climate Center Green Infrastructure Toolkit	2022	Georgetown Climate Center	Toolkit	2, 3	X	X		X					X	X	Green Infrastructure Toolkit » About This Toolkit - Georgetown Climate Center	Toolkit from Georgetown Law on Green infrastructure planning	

Matrix 1. State of the Science: Resources Exploring the Intersection of Green Stormwater Infrastructure and Climate Change																	
Title	Year	Author(s)	Resource Type	Priority Item (1 to 5)	Green Stormwater Infrastructure		Climate Change Impact								Focus on Equity	Web Link	Brief Summary
					Mention of GSI	Focus on GSI	Urban Heat	Precip	Snow-fall	Sea Level/Lake/ Riverine Rise	Water Stress	Bio-diversity	Tree/ Green Equity	Air Quality			
Climate Resiliency Design Guidelines	2020	NYC Mayor's Office of Resiliency	Guide	3,4,5	X		X	X			X						The guide provides potential future climate outlook for NYC and provides toolkits to help assess and plan for resilient designs.
Water Utility Resilience Program	2021	State of Massachusetts	Program	3, 4, 5								X				Water Utility Resilience Program Mass.gov	This program aim at helping water and wastewater utilities to identify helpful and practical resiliency resources, finding opportunities for local and regional partnerships, offering infrastructure mapping and adaptation planning assistance, and coordinating training opportunities. It also provides various tools.
Coastal Flood Resilience Design Guidelines	2019	Boston planning and development agency	Guide	4	X		X	X			X					Boston Planning and Development Agency Releases Coastal Flood Resilience Design Guidelines – NorthEndWaterfront.com	This guide aims to raise awareness of future coastal flood risk, offer strategies to reduce damage and disruption, and provide consistent standards for review of projects that fall within the proposed zoning overlay district.
Climate Resilient Neighborhood of Østerbro	2022	The City of Copenhagen	Website		X			X								Klimakvarter Østerbro	Case study of Copenhagen's first climate resilient neighborhood
Dynamic Adaptive Policy Pathways	2016	Deltares	Website	3, 4, 5												Dynamic Adaptive Policy Pathways - Adaptation Pathways Deltares Public Wiki	The webpage explains the dynamic adaptive policy pathways approach, which aims to support the development of an adaptive plan that is able to deal with conditions of deep uncertainties.
Climate adaptation app	-	Bosch Slabbers, Deltares, Sweco, KNMI, Witteveen+Bos, Climate Changes spatial planning	Website		X			X				X				Adaptive Solutions (climateapp.nl)	The app gives urban designers, engineers or others insight in feasible measures for a project with a specific climate adaptation goal. The app will generate a selection of feasible climate adaptation measures in less than a minute. If for instance, an urban development in a flood plain is to be prepared for river flooding, the app will rank feasible measures based on the local conditions and the user's input. The user guide can be found here.
Green Cities: Good Health	2010	Urban Forestry / Urban Greening Research	Program		X							X	a			Introduction :: Green Cities: Good Health (washington.edu)	The program support research in the area of showing how nature benefits the human health and well-being in the urbanized areas.
Water Utility Climate Alliance (WUCA) website	2022	Water Utility Climate Alliance	Website	2, 3, 4	X		X	X			X	X				https://www.wucaonline.org/	Website full of resources especially in relation to actionable science, e.g. climate change projections etc. See Plans and Publications and items under work plan, and Case Studies section as well
Advancing Stormwater Resiliency in Maryland (A-StoRM) Maryland's Stormwater Management Climate Change Action Plan	2021	Maryland Department of the Environment	Report	3, 4, 5	X	X		X								https://mde.maryland.gov/Documents/A-StoRMreport.pdf	The report proposes consideration of regulatory changes to include the use of the most recent NOAA Atlas 14 precipitation estimates in Maryland's Stormwater Design Manual and to develop draft updates to Maryland's stormwater design standards for ESD to MEP to capture increased stormwater runoff volume (e.g., 3.0 inches for the 1-year rainfall event) for new development and redevelopment based upon future climate projections.
Philadelphia Climate Action Playbook	2021	The City of Philadelphia Office of Sustainability	Report	4,5	X		X	X			X	X	X	X		https://www.phila.gov/documents/philadelphia-climate-action-playbook-resources/	The Philadelphia Climate Action Playbook outlines the actions Philadelphia is taking to respond to climate change through 2050. The Playbook also outlines how climate change will impact Philadelphia and where we need to go further to achieve our goals
Managing Heavy Rainfall with Green Infrastructure: An Evaluation in Pittsburgh's Negley Run Watershed	2020	Fischbach et al	Journal Article	1,2,3,4	X	X		X								https://www.rand.org/pubs/research_report/RRA564-1.html	The researchers identified potential climate change impacts for the Negley Run watershed, where urgent flood-risk challenges are presented in the city. In the project, the researchers use simulation modeling (SWMM) to evaluate present and future risks in Negley Run from sewer overflows and flooding given future rainfall uncertainty. Then, the authors evaluate proposals for a phased series of GSI investment. The study also showcases the recreational and other cobenefits of the GSI in addition to the stormwater benefits.
Quantifying the Uncertainty Created by Non-Transferable Model Calibrations Across Climate and Land Cover Scenarios: A Case Study With SWMM	2022	Sytsma et al	Journal Article	4												https://agupubs.onlinelibrary.wiley.com/doi/epdf/10.1029/2021WR031603	The paper attempts to quantify the error in model prediction that arises when the optimal calibrated value of effective parameters changes with model forcing. A case study with SWMM was conducted with the specific parameters of subcatchment 'width' and 'connected impervious area'. The authors concluded that variation across forcing parameters can result in significant prediction errors. These results point to a need for additional research to determine how to use urban hydrologic models to make robust predictions across future conditions.
Trees and Hydrology in Urban Landscapes	2021	Whipple et al; San Francisco Estuary Institute & The Aquatic Science Center	Report	1, 2	X	X										https://www.sfei.org/documents/trees-and-hydrology-urban-landscapes	This effort seeks to build links between stormwater management and urban ecological improvements by evaluating how complementary urban greening activities, including green stormwater infrastructure (GSI) and urban tree canopy, can be integrated and improved to reduce runoff and contaminant loads in stormwater systems. This work expands the capacity for evaluating engineered GSI and non-engineered urban greening within a modeling and analysis framework, with a primary focus on evaluating the hydrologic benefit of urban trees. Insights can inform stormwater management policy and planning.
Green Stormwater Infrastructure Maintenance Manual	2016	Philadelphia Water Department	Manual	1, 3	X	X										https://water.phila.gov/pool/files/gsi-maintenance-manual.pdf	Philadelphia's GSI maintenance manual for various stormwater management practices.
Green Stormwater Infrastructure Landscape Design Guidebook	2020	Philadelphia Water Department	Guide	1, 3	X	X										https://water.phila.gov/pool/files/gsi-landscape-design-guidebook.pdf	Philadelphia's GSI landscape design guidebook.
Green Stormwater Infrastructure Planning & Design Manual	2021	Philadelphia Water Department	Manual	1, 3	X	X										https://water.phila.gov/gsi/planning-design/manual/	Philadelphia's GSI planning and design manual.
Examples of Green Infrastructure Projects in San Francisco	2022	San Francisco Public Utilities Commission	Website	1	X	X										https://sfpub.org/programs/san-francisco-urban-watersheds/what-green-infrastructure	SFPUC's webpage explaining what is green infrastructure and showing examples of GI. The webpage also include monitoring reports for various existing GI in San Francisco.
FEMA: Nature-Based Solutions	2022	FEMA	Website	1	X											https://www.fema.gov/emergency-managers/risk-management/nature-based-solutions	FEMA's risk management guide focusing on nature-based solutions.

Matrix 1. State of the Science: Resources Exploring the Intersection of Green Stormwater Infrastructure and Climate Change																		
Title	Year	Author(s)	Resource Type	Priority Item (1 to 5)	Green Stormwater Infrastructure		Climate Change Impact								Focus on Equity	Web Link	Brief Summary	
					Mention of GSI	Focus on GSI	Urban Heat	Precip	Snow-fall	Sea Level/Lake/ Riverine Rise	Water Stress	Bio-diversity	Tree/ Green Equity	Air Quality				
Nature-based solutions for climate change mitigation	2021	United Nation Environment Programme (UNEP) & International Union for Conservation of Nature (IUCN)	Report	1	X		X	X	X		X	X	X	X	X		https://www.iucn.org/home/nature-based-solutions	The report shows the benefits and challenges of using nature-based solutions to combat climate changes.
San Francisco Public Utilities Commission Green Stormwater Infrastructure Maintenance Cost Model	2018	San Francisco Public Utilities Commission	Model	1, 3	X	X											https://sfpub.sharefile.com/d-5d59402b587f4fe59	SFPUC developed this GSI maintenance cost model and have been sharing it with other municipalities. This would serve as a starting point of developing future maintenance cost model with climate resilience in mind.
Reimagining parks as stormwater infrastructure—stormwater parks of all sizes, designs, and funding sources	2019	Bryant et al	Article	1,3, 4, 5	X	X		X									http://www.newea.org/wp-content/uploads/2019/03/NEWEA-Journal_Spr19.pdf#page=19	This paper provides an overview of funding sources, design strategies, water quality improvements, and additional co-benefits provided by multi-objective green stormwater infrastructure in parks and public spaces. Example projects of all sizes from New York City, Atlanta, and Calgary are described, and an example of a successful Institute for Sustainable Infrastructure Envision verification and award process for a stormwater park is also be shared.
Cloudburst Resiliency Planning Study	2017	New York City Department of Environmental Protection & Ramboll	Report	1, 2, 4, 5	X	X		X									https://www1.nyc.gov/assets/dep/downloads/pdf/climate-resiliency/nyc-cloudburst-study.pdf	This executive summary describes the process and findings from the Cloudburst Resiliency Planning Study carried out by Ramboll in 2016. The methodology builds upon Ramboll's experience and city-to-city collaboration regarding cloudburst solutions development for the City of Copenhagen. The purpose of the project is to provide insight on ways to advance climate resiliency projects and traditional stormwater solutions to mitigate inland flooding and accommodate future increase in rainfall intensity through integration with ongoing urban planning and development.
New York City Stormwater Resiliency Plan	2021	NYC Mayor's Office of Resiliency	Plan	1, 2, 5	X	X		X									https://www1.nyc.gov/assets/orr/pdf/publications/stormwater-resiliency-plan.pdf	The Stormwater Resiliency Plan (the "Plan") outlines the City's approach to managing the risk of extreme rain events. Truly holistic planning for rain-driven flooding involves consideration of both large storm events and the chronic worsening of average conditions. For this reason, the Plan addresses emergency response procedures as well as accounting for increasing rainfall in standard design and long term planning of stormwater infrastructure.
An unexpected item is blocking cities' climate change prep: obsolete rainfall records	2022	National Public Radio (NPR)	Article	4				X									https://www.npr.org/2022/02/09/1078261183/an-unexpected-item-is-blocking-cities-	The article points out that the lack of rainfall data is a critical challenge for future planning of storm water infrastructure.
U.S. Climate Resilience Toolkit	2016	NOAA	Website		X		X	X	X	X	X	X	X	X	X	X	https://toolkit.climate.gov	
New Solutions for Sustainable Stormwater Management in Canada	2016	Sustainable Prosperity	Report		X													
Governor Newsom Signs Climate Action Bills	2021	Office of Governor Gavin Newsom	Press Release														https://www.gov.ca.gov/2021/09/23/governor-newsom-signs-climate-action-bills-outlines-historic-15-billion-package-to-tackle-the-climate-crisis-and-protect-vulnerable-communities/	

Matrix 2. Original Studies that Established the Conceptual Model for GSI Design																	
Title	Year	Author(s)	Resource Type	Priority Item (1 to 5)	Green Stormwater Infrastructure		Climate Change Impact							Focus on Equity	Web Link	Brief Summary	
					Mention of GSI	Focus on GSI	Urban Heat	Precip	Snow-fall	Sea Level/Lake/ Riverine Rise	Water Stress	Bio-diversity	Tree/ Green Equity				Air Quality
Controlling Urban Runoff: A Practical Manual for Planning and Designing Urban BMPs	1987	Thomas R. Schueler for Washington Metropolitan Water Resources Planning Board	Manual	3	X	X										Controlling Urban Runoff Metropolitan Washington Council of Governments (mwcoq.org)	Manual provides detailed guidance on how to plan and design urban best management practices to remove pollutants and protect stream habitats
Design and Construction of Urban Stormwater Management Systems	1992	Water Environment Research Federation and American Society of Civil Engineers	Manual	3	X	X										https://ascelibrary.org/doi/book/10.1061/9780872628557	
Stormwater: Best Management Practices and Detention for Water Quality, Drainage and CSO Management, 2nd Edition	1992	Urbanas and Stahre	Textbook	3	X	X										https://www.amazon.com/Stormwater-Management-Practices-Detention-1992-10-01/dp/B01A65DCAS	
Surface Water Design Manual	1998	King County Stormwater Services	Manual	3	X	X										https://your.kingcounty.gov/dnrp/library/water-and-land/stormwater/surface-water-design-manual/1998-swdm.zip	
Stormwater Collection Systems Design Handbook	2001	Mays	Textbook	3	X	X										https://www.zoju.edu/jo/download/stormwater-collection-systems-design-handbook-2001.pdf	
Stormwater Treatment: Biological, Chemical, and Engineering Principles	2002	Minton	Textbook	3	X	X										https://books.google.com/books/about/Stormwater_Treatment.html?id=T5rRAAACA-AJ	
CASQA Stormwater BMP Handbook - New Development and Redevelopment	2003	CASQA	Manual	3	X	X											BMP manual from CASQA
Municipal Stormwater Management, 2nd Edition	2003	Debo and Reese	Textbook	3	X	X										https://www.routledge.com/Municipal-Stormwater-Management/Debo-Reese/p/book/9781566705844	
Stormwater Best Management Practices Design Guide (Volume 1, 2, and 3)	2004	U.S. Environmental Protection Agency	Manual	3	X	X										https://cfpub.epa.gov/slsl_public_record_Report.cfm?Lab=NRMRL&dirEntryId=99739	

Matrix 3. Regional-Focused Impacts and Global Hydrologic Impacts of Climate Change																
Title	Year	Author(s)	Resource Type	Priority Item (1 to 5)	Green Stormwater Infrastructure		Climate Change Impact							Focus on Equity	Web Link	Brief Summary
					Mention of GSI	Focus on GSI	Urban Heat	Precip	Snow-fall	Sea Level/Lake/ Riverine Rise	Water Stress	Bio-diversity	Tree/Green Equity			
Effects of climate change on hydrology and water resources in the Columbia River Basin	1999	Hamlet & Lettenmaier	Journal Article							X						General climate impacts in the Columbia River Basin.
Effects of simulated climate change on the hydrology of major river basins	2001	Arora & Boer	Journal Article						X							The paper explore the potential effects of global warming on the hydrology of 23 major rivers. It focuses on runoff and discharges.
Hydrologic sensitivity of global rivers to climate change	2001	Nijssen et al.	Journal Article							X						Used GCMs to predict future climate impact on hydrology.
The effects of climate change on water resources in the west: Introduction and overview	2004	Barnett et al.	Journal Article													Assessment of the effects of climate change on water resources in the western United States. The assessment focuses on the potential changes over the first half of the 21st century on the Columbia, Sacramento/San Joaquin, and Colorado river basins.
Potential impacts of a warming climate on water availability in snow-dominated regions	2005	Barnett, Adam, & Lettenmaier	Journal Article							X		X				With a modest increase in near-surface air temperature, the alterations of the hydrological cycle are expected to take place via seasonal shifts in stream-flow in snowmelt-dominated regions. This change can lead to regional water shortages in areas without adequate water storage capacity.
Changes toward earlier streamflow timing across Western North America	2005	Stewart, Cayan, & Dettinger	Journal Article							X						Changes in timing of snowmelt-derived streamflow from 1948 to 2002 were investigated through trend and principal component analyses.
Human-induced changes in the hydrology of the Western United States	2008	Barnett et al.	Journal Article													Used hydrological models together with global climate models to show that up to 60% of the climate-related trends of river flow, winter air temperature, and snowpack between 1950 to 1999 are human-induced.
Implications of 21st century climate change for the hydrology of Washington State	2010	Elsner et al.	Journal Article							X						Impacts of climate changes on the hydrological cycle in Pacific northwest; focus on the greater Columbia River watershed and Yakima River watershed; main parameters looked at are snow water equivalent, soil moisture, runoff, and streamflow under different emissions scenarios
Adapting to the impacts of climate change	2010	National Research Council	Report	5												General climate changes in the US and adaptation options and strategies.
Climate change effects on stream and river temperatures across the northwest U.S. from 1980-2009 and implications for salmonid fishes	2012	Isaak et al.	Journal Article										X			The team assembled 18 temperature time-series from sites on regulated and unregulated streams in the NW US to describe historical trends from 1980 to 2009 and assess thermal consistency between these stream categories.
Geomorphological records of extreme floods and their relationship to decadal-scale climate change	2014	Foulds et al.	Journal Article													Study of the geomorphological traces of extreme rainfall and floods occurrence between 1900 to 1960 in the Cambrian Mountains of Wales, UK.
Estimates of Twenty-First-Century Flood Risk in the Pacific Northwest Based on Regional Climate Model Simulations	2014	Salathe et al.	Journal Article						X							The paper shows substantial increases in future flood risk (2040-69) in many Pacific Northwest river basins in the early fall using a regional climate model simulation. Two primary causes: more extreme and earlier storms and warming temperatures that shift precipitation from snow to rain dominance over regional terrain
Local Enhancement of Extreme Precipitation during Atmospheric Rivers as Simulated in a Regional Climate Model	2018	Lorente-Plazas et al.	Journal Article						X							This paper examines the synoptic conditions that yield extreme precipitation in two regions with different orographic features, the Olympic Mountains and Puget Sound.
Integrated Vulnerability Assessment of Climate Change in the Lake Tahoe Basin	2020	CA Tahoe Conservancy & Catalyst Environmental Solutions	Report						X	X		X	X		tahoe.ca.gov/vulnerability-assessment	This report aims to provide residents, visitors, businesses, and public agencies with state-of-art information on how patterns of temperature and precipitation will change, and how these patterns will affect the things people care about.

2022

Pesticide Annual Report and Effectiveness Assessment

California Stormwater Quality Association



Final Report
August 2022

Preface

The California Stormwater Quality Association (CASQA) is comprised of stormwater quality management organizations and individuals, including cities, counties, federal agencies, state agencies, ports, universities and school districts, wastewater agencies, water suppliers, special districts, industries, and consulting firms throughout California. CASQA's membership provides stormwater quality management services to more than 26 million people in California.

This report provides CASQA's members with focused information on its efforts to prevent pesticide pollution in urban waterways. It is a component of CASQA's True Source Control Initiative, which seeks to address stormwater and urban runoff pollutants at their sources. This report was funded by CASQA, Alameda Countywide Clean Water Program, Contra Costa Clean Water Program, Fairfield-Suisun Urban Runoff Management Program, Marin County Stormwater Pollution Prevention Program, Napa Countywide Stormwater Pollution Prevention Program, Sacramento Stormwater Quality Partnership, San Mateo Countywide Water Pollution Prevention Program, Santa Clara Valley Urban Runoff Pollution Prevention Program, Sonoma County Water Agency, and Vallejo Flood & Wastewater District.

This report was prepared by Stephanie Hughes under the direction of the CASQA True Source Control Subcommittee (outgoing Program Manager: Dave Tamayo and incoming Program Manager: Vicki Kalkirtz), with input from Tammy Qualls of Qualls Environmental Consulting.

DISCLAIMER

Neither CASQA, its Board of Directors, the True Source Control Subcommittee, any contributors, nor the authors make any warranty, expressed or implied, nor assume any legal liability or responsibility for any third party's use of this report or the consequences of use of any information, product, or process described in this report. Mention of trade names or commercial products, organizations, or suppliers does not constitute an actual or implied endorsement or recommendation for or against use, or warranty of products.

Copyright © 2022 California Stormwater Quality Association.

All rights reserved. CASQA member organizations may include this report in their annual reports provided credit is provided to CASQA. Short sections of text, not to exceed three paragraphs, may be quoted without written permission provided that full attribution is given to the source.

Abbreviations Used in this Report

BACWA – Bay Area Clean Water Agencies

BO – Biological Opinion

CASQA – California Stormwater Quality Association

CEQA – California Environmental Quality Act

CWA – Clean Water Act

DPR – California Department of Pesticide Regulation

EMPM – Environmental Monitoring Public Meeting

EPA – United States Environmental Protection Agency

ESA – Endangered Species Act

FIFRA – Federal Insecticide, Fungicide, and Rodenticide Act

IPM – Integrated Pest Management

MAA – Management Agency Agreement between DPR and the Water Boards

MS4 – Municipal Separate Storm Sewer System

NACWA – National Association of Clean Water Agencies

NPDES – National Pollutant Discharge Elimination System

OPP – U.S. EPA Office of Pesticide Programs

OW – U.S. EPA Office of Water

PAH – Polycyclic aromatic hydrocarbon

PEAIP – Program Effectiveness Assessment and Improvement Plan

PID – Proposed Interim Decision

PMAC – Pest Management Advisory Committee

PPDC – EPA's Pesticide Program Dialogue Committee

SFBRWQCB – San Francisco Bay Regional Water Quality Control Board

SPM – Sustainable Pest Management Work Group (DPR)

STORMS – Strategy to Optimize Resource Management of Storm Water (a program of the State Water Board)

SWAMP – California Water Boards Surface Water Ambient Monitoring Program

TMDL – Total Maximum Daily Load (regulatory plan for solving a water pollution problem)

TSC – CASQA True Source Control Subcommittee

UP3 – Urban Pesticides Pollution Prevention Partnership

UPA – Urban Pesticide Amendments

USGS – U.S. Geological Survey

Water Boards – California State Water Resources Control Board together with the California Regional Water Quality Control Boards

Contents

Preface	1
Abbreviations Used in this Report	2
Executive Summary	3
Section 1. Introduction	5
1.1 Importance of CASQA's Efforts to Improve Pesticide Regulation	5
1.2 CASQA's Goals and Application to Program Effectiveness Assessment	10
Section 2. Latest Results of CASQA Efforts	11
2.1 Near-Term Regulatory Concerns	11
2.2 Long-Term Change in the Pesticides Regulatory Structure	19
Section 3. CASQA's Approach Looking Ahead.....	23
Appendices:	
Appendix A: CASQA/BACWA Factsheet	
Appendix B: CASQA/BACWA Presentation at EPA Environmental Monitoring Public Meeting	
Appendix C: Regulatory Participation Outcomes and Effectiveness Assessment Summary Tables	

List of Figures

Figure 1. The Pesticide Regulatory System Can Lead to Harmful Outcomes to Surface Waters, Proving Costly to Municipalities	8
Figure 2. Via Proactive Use of the Pesticide Regulatory Structure, CASQA and Partners Seek to Restrict Pesticide Uses that have the Potential to Cause Urban Water Quality Problems.....	9
Figure 3. EPA's Registration Process for New Pesticides	14
Figure 4. EPA's Registration Review – Process to Review Registered Pesticides at a Minimum of Every 15 Years.....	14

List of Tables

Table 1. California TMDLs, Statewide Water Quality Control Plans, and Basin Plan Amendments Addressing Currently Registered Pesticides and/or Toxicity in Urban Watersheds	6
Table 2. Current Pesticide Watch List (July 2022).....	12
Table 3. Latest Results of Efforts Communicating Near-Term Regulatory Concerns to EPA.....	16
Table 4. Participation in Federal and State Efforts to Support CASQA's Goals	22
Table 5. CASQA Pesticide Activities	24
Table 6. Anticipated Upcoming Opportunities for Pesticides Regulatory Engagement	25

Executive Summary

This report by the True Source Control (TSC) Subcommittee of the California Stormwater Quality Association (CASQA) describes CASQA's activities related to the goal of preventing pesticide pollution in urban waterways for the period of July 2021 through June 2022.

To address the problems caused by pesticides in California's urban waterways, CASQA collaborates with the California State Water Resources Control Board and the California Regional Water Quality Control Boards (Water Boards). By working with the Water Boards and other water quality organizations, we address the impacts of pesticides efficiently and proactively through the statutory authority of the California Department of Pesticide Regulation (DPR) and EPA's Office of Pesticide Programs (OPP). More than 18 years of collaboration with Urban Pesticides Pollution Prevention (UP3) Partnership, as well as EPA and DPR staff, has resulted in significant changes in pesticide regulation. A summary of CASQA's activities to address key management questions are described below, with more details and outcomes provided in Section 2.

Near term / Current problems – Are actions being taken by State and Federal pesticides regulators and stakeholders that are expected to end pesticide-caused toxicity or exceedances of pesticide water quality objectives in surface waters receiving urban runoff?

- 💧 CASQA shared its urban runoff expertise with pesticide regulators by preparing comment letters to EPA for eight pesticide reviews, providing the Water Boards and other partners with information that triggered additional letters on one pesticide. (See Table 3 and Appendix C.)
- 💧 CASQA and partners successfully lobbied the federal General Services Administration (GSA) to return functionality and transparency to the Regulations.Gov website, the public access point for federal agency rulemaking including EPA pesticide dockets.
- 💧 In response to requests from CASQA and partners, EPA proposed enhanced label language for pyrethrins.
- 💧 To mitigate risks to aquatic organisms and human health, EPA proposed substantial mitigation measures for the herbicide, oxyfluorfen.
- 💧 CASQA updated the Pesticide Watch List based on new EPA registrations and the State's update to the 303(d) list. The Watch List will be shared with pesticides regulators and with government agency and university scientists to stimulate generation of surface water monitoring and aquatic toxicity data for the highest priority pesticides. (See Table 2.)

Long term / Prevent future problems – Do pesticides regulators have an effective system in place to exercise their regulatory authorities to prevent pesticide toxicity in urban water bodies?

- 💧 DPR continues to demonstrate its commitment to addressing pesticide impacts on receiving waters through timely mitigation and implementation of improved evaluation procedures.
- 💧 The State Water Board continued to work toward development of the Urban Pesticide Amendments (UPA). The desired outcome for these amendments is to institutionalize the State's strategy of utilizing pesticide regulations as the primary mechanism for addressing pesticide water quality problems associated with urban runoff. In spring 2022, CASQA met with State Water Board staff to provide potential options for evaluating the effectiveness of the UPAs in addressing MS4 pesticide discharges, to support identification of compliance pathway options for municipal stormwater permits.
- 💧 To support the UPA, the State Water Board continued to work toward establishing a coordinated urban runoff monitoring program intended to coordinate with existing Water Board and DPR urban pesticides and toxicity monitoring programs. The State Water Board continued to draft a proposed monitoring program and expects to present a document for public comment in spring 2023. CASQA remains dedicated to supporting State Water Board staff.

2022 Pesticide Annual Report and Effectiveness Assessment

- 💧 In 2022, the EPA published a workplan to address the incorporation of their Endangered Species Act (ESA) obligation with pesticide registrations and re-registrations.
- 💧 Although many improvements have been made by EPA OPP since the early 2000s, improvement in scientific evaluations supporting EPA OPP's regulatory efforts and better understanding of urban runoff management systems are still necessary to adequately protect urban surface waters from pesticide impairments. The regulatory climate recently improved at the federal level and we will continue to work with EPA OPP to further our goals.
- 💧 In June, CASQA spoke at EPA's Environmental Monitoring Public Meeting to convey the importance of including urban uses in ESA mitigations, emphasizing that such mitigations are feasible and cost-effective.
- 💧 In spring 2022, Dave Tamayo, a longtime TSC member and recent retiree from Sacramento County, was appointed to EPA's Pesticide Program Dialog Committee (PPDC) representing an important opportunity to enhance urban stormwater discussions at the federal level. CASQA subsequently designated Mr. Tamayo as CASQA's official representative at the PPDC.

In the coming year, CASQA plans to continue to address near-term pesticide concerns and seek long-term regulatory change. Future near-term and long-term tasks are identified in Section 3, Tables 5 and 6. Key topics include:

- 💧 Continued support of the eventual completion and adoption of the UPAs by the State Water Board;
- 💧 Continued development of a coordinated monitoring program in partnership with the Water Boards, DPR, and EPA Region 9;
- 💧 Registration review-related activities at EPA for pyrethroids and fipronil;
- 💧 Initiating discussion of urban water quality concerns at the EPA PPDC's future meetings;
- 💧 DPR registration applications and proposed decisions for new products.

Section 1. Introduction

1.1 IMPORTANCE OF CASQA'S EFFORTS TO IMPROVE PESTICIDE REGULATION

For decades, the uses of certain pesticides in urban areas – even when applied in compliance with pesticide regulations – have adversely impacted urban water bodies. Currently used pesticides are the primary cause of toxicity in California surface waters, including urban water bodies.¹ Under the Clean Water Act (CWA), when pesticides impact water bodies, local agencies may be held responsible for exceedances in surface waters, as well as costly monitoring and mitigation efforts. To date, some California municipalities² have incurred substantial costs to comply with pesticides-related Total Maximum Daily Loads (TMDLs) and additional permit requirements. In some cases (e.g., diazinon, chlorpyrifos), municipal compliance costs have continued more than a decade after termination of virtually all urban use. In the future, more municipalities throughout the state are expected to be subject to similar requirements, as additional TMDLs and Basin Plan Amendments are adopted (Table 1). Meanwhile, local agencies have no authority to restrict or regulate when or how pesticides are used³ in order to proactively prevent pesticide pollution and avoid these costs and liabilities.

Under federal and state statutes, EPA and DPR have the authority and responsibility to regulate pesticides and protect water bodies from adverse effects (including impacts from pesticides in urban runoff). Unfortunately, until the relatively recent past, these agencies did not recognize the need, nor possess the institutional capacity, to exercise their authority to protect urban water quality. As a result, past registration actions have allowed a number of pesticides (such as pyrethroids and fipronil) to be used legally in ways that have resulted in widespread pollution in urban water bodies. This situation is depicted in Figure 1.

To change this situation, CASQA is actively engaged with state and federal regulators in an effort to develop an effective pesticide regulatory system, based primarily on existing statutes, that includes timely identification and mitigation of urban water quality impacts, and proactively prevents additional problems through the registration and registration review processes (Figure 2).

New Pesticide 303(d) Listings and Delistings Approved in 2022

In January 2022, the State Water Board adopted the 2020-2022 Integrated Report for which the Central Coast, Central Valley and San Diego Regions were scheduled for on-cycle 303(d) reviews. The report was subsequently submitted to and approved by EPA.

Listings: The report included numerous additional 303(d) pesticide listings for all three regions. While the most common listings were for pyrethroids (either specific individual pesticides or the overall pyrethroid group), other listings include imidacloprid, fipronil and diuron. Dichlorvos was also added for an urban creek in San Diego and Bensulide (an organophosphate pesticide) was added for an urban/rural mixed region in Monterey County.

Delistings: The report included 38 delistings from the 303(d) list, most of which were diazinon (urban uses already prohibited) and chlorpyrifos (no meaningful urban uses). Notably, organophosphate pesticides were delisted for an urban waterway in Sacramento and two urban waterways in Stockton due to attaining water quality standards.

[\(State Water Board's 2020-2022 Integrated Report, May 11, 2022\).](#)

¹ See reports from the California Surface Water Ambient Monitoring Program Sediment Pollution Trends Program including Anderson, B.S., Hunt, J.W., Markewicz, D., Larsen, K., 2011. Toxicity in California Waters, Surface Water Ambient Monitoring Program. California Water Resources Control Board. Sacramento, CA.

² For example, Sacramento-area municipalities spent more than \$75,000 in the 2008-2013 permit term on pyrethroid pesticide monitoring alone; Riverside-area municipalities spent \$617,000 from 2007 to 2013 on pyrethroid pesticide chemical and toxicity monitoring.

³ Local agencies in California have authority over their own use of pesticides but are pre-empted by state law from regulating pesticide use by consumers and businesses.

Table 1. California TMDLs, Statewide Water Quality Control Plans, and Basin Plan Amendments Addressing Currently Registered Pesticides and/or Toxicity in Urban Watersheds^{4, 5, 6}

Water Board Region	Water Body	Pesticide	Status
Statewide	All MS4s/All Urban Waterways: Statewide Water Quality Control Plan amendments for urban pesticides reduction [“Urban Pesticides Amendments”] (Inland Surface Waters, Enclosed Bays & Estuaries, and Ocean)	All Pesticides/All pesticide-related toxicity	In preparation
	Sediment Quality Objectives (Enclosed Bays & Estuaries)	Sediment Toxicity ⁷	Approved
	Toxicity Provisions (Inland Surface Waters and Enclosed Bays & Estuaries)	Toxicity ⁷	Adopted by State; awaiting EPA approval ⁸
San Francisco Bay (2)	All Bay Area Urban Creeks	All Pesticide-Related Toxicity	Approved
Central Coast (3)	Santa Maria River Watershed Lower Salinas River Watershed	Pyrethroids, Toxicity Pyrethroids, Toxicity Malathion, Chlorpyrifos, Diazinon ⁹	Approved Approved Adopted by Central Coast Water Board, June 2022 ¹⁰
	San Lorenzo River Watershed (Santa Cruz)	Chlorpyrifos ⁹	Approved
Los Angeles (4)	Marina del Rey Harbor	Copper (Marine antifouling paint) ¹¹	Approved
	Oxnard Drain 3 (Ventura County)	Bifenthrin, Toxicity	EPA-Adopted Technical TMDL
	Calleguas Creek, its Tributaries and Mugu Lagoon	Water & Sediment Toxicity ⁷ Diazinon & Chlorpyrifos ⁹	Approved
	McGrath Lake (Ventura County)	Sediment Toxicity ⁷	Approved
	Colorado Lagoon (Long Beach)	Sediment Toxicity ⁷	Approved
	Dominguez Channel; Greater Los Angeles & Long Beach Harbor Ballona Creek Estuary	Sediment Toxicity ⁷ Sediment Toxicity ⁷	Approved Approved

⁴ Excludes pesticides that are not currently registered in California, such as organochlorine pesticides.

⁵ https://www.waterboards.ca.gov/water_issues/programs/tmdl/

⁶ https://www.waterboards.ca.gov/water_issues/programs/tmdl/2020_2022state_ir_reports_final/apx_d_adopted_tmdls_list.pdf

⁷ These TMDLs/Plan provisions can trigger toxicity testing stressor source identification studies, and additional follow up, even when toxicity is linked to current pesticides.

⁸ https://www.waterboards.ca.gov/water_issues/programs/state_implementation_policy/tx_ass_cntrl.html

⁹ Use prohibited in urban areas (diazinon) or no meaningful use due to use limitations (chlorpyrifos).

¹⁰ https://www.waterboards.ca.gov/centralcoast/board_info/agendas/2022/jun/item8_att1a.pdf

¹¹ Primarily addresses pesticides that are directly discharged and should not ordinarily appear in stormwater (marine antifouling paint).

Water Board Region	Water Body	Pesticide	Status
Central Valley (5)	Sacramento River and San Joaquin River Basins	Pyrethroids	Approved
	Sacramento-San Joaquin River Delta Waterways	Diazinon & Chlorpyrifos ⁹	Approved
	Sacramento & Feather Rivers	Diazinon & Chlorpyrifos ⁹	Approved
	Sacramento County Urban Creeks	Diazinon & Chlorpyrifos ⁹	Approved
	Lower San Joaquin River	Diazinon & Chlorpyrifos ⁹	Approved
Lahontan (6)	Pesticide Discharge Prohibition	All Pesticides	Approved
Santa Ana (8)	Newport Bay	Copper (Marine antifouling paint) ¹¹	In preparation ¹²
	San Diego Creek, and Upper and Lower Newport Bay	Toxicity (Diazinon & Chlorpyrifos) ⁹	EPA-Adopted Technical TMDL
San Diego (9)	Shelter Island Yacht Basin (San Diego Bay)	Copper (Marine antifouling paint) ¹¹	Approved
	Chollas Creek	Diazinon ⁹	Approved

¹² <https://www.newportbeachca.gov/government/departments/public-works/ocean-water-quality/newport-bay-copper>

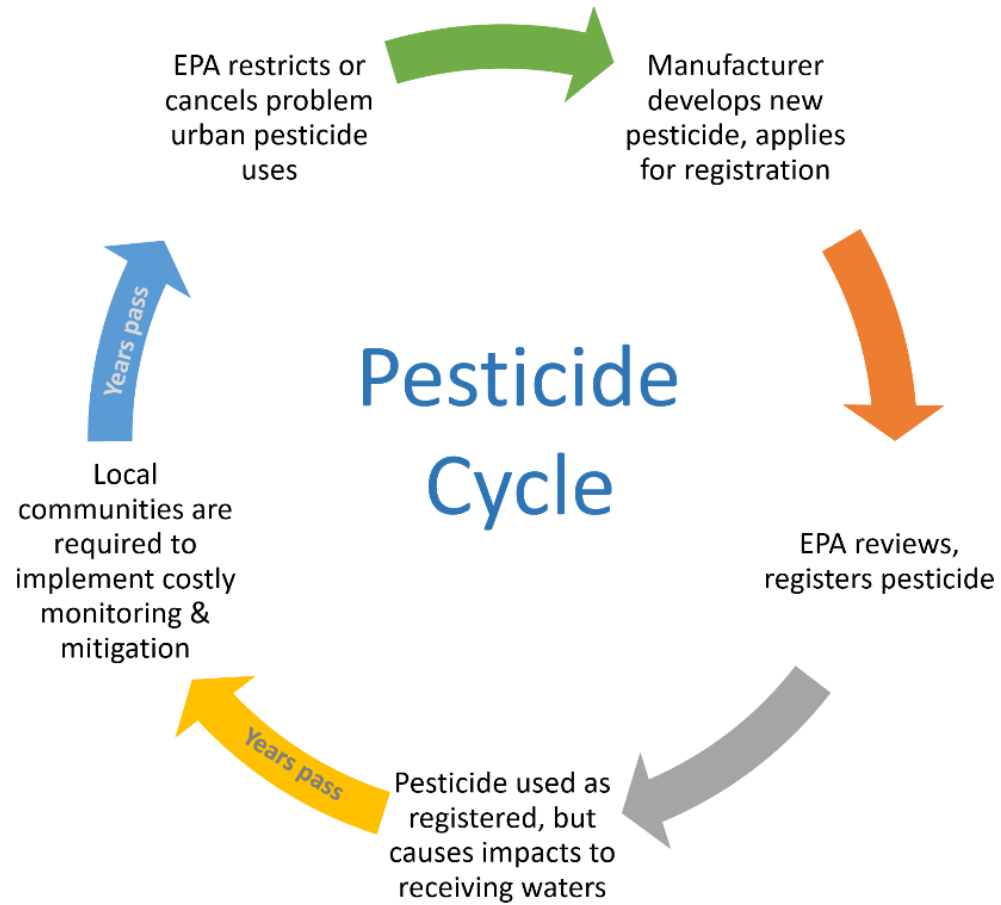


Figure 1. The Pesticide Regulatory System Can Lead to Harmful Outcomes to Surface Waters, Proving Costly to Municipalities.

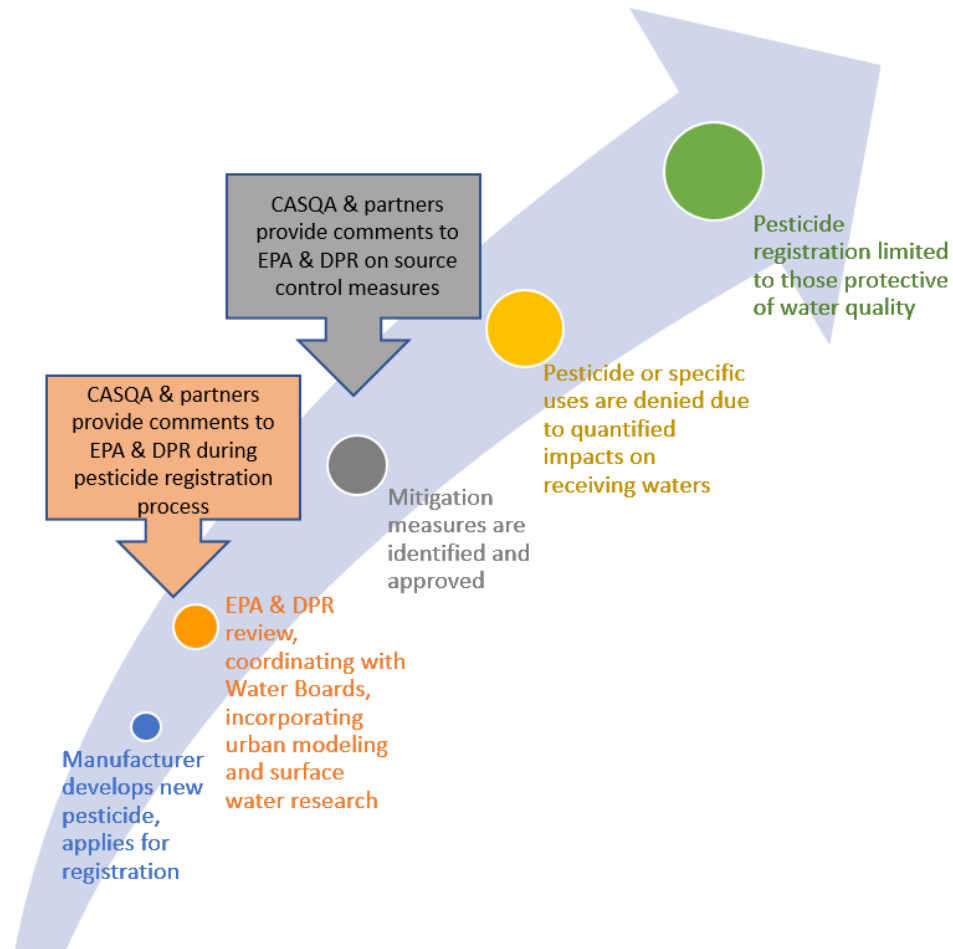


Figure 2. Via Proactive Use of the Pesticide Regulatory Structure, CASQA and Partners Seek to Restrict Pesticide Uses that have the Potential to Cause Urban Water Quality Problems.

1.2 CASQA'S GOALS AND APPLICATION TO PROGRAM EFFECTIVENESS ASSESSMENT

CASQA's *Vision for Stormwater*, first approved by the Board of Directors in 2015, is periodically updated to reflect developments in stormwater management. In October 2020, CASQA released the updated *Vision for Sustainable Stormwater Management*.¹³ Within CASQA's Vision, Action 1.2 is to "Minimize Pollution Through True Source Control." Among the objectives described within Action 1.2, Objective 2 has the following scope:

Objective 2: Implement an Urban Pesticide Program

For decades now, the uses of certain pesticides in urban areas – even when applied in compliance with pesticide regulations – have adversely impacted urban water bodies. Currently used pesticides are the primary cause of toxicity in California surface waters, including urban water bodies. CASQA is actively engaged with state and federal regulators in an effort to develop an effective pesticide regulatory system, based primarily on existing statutes, that includes timely identification and mitigation of urban water quality impacts, and proactively prevents additional problems through the registration and registration review processes.

Potential Collaborators: State Water Board, DTSC, EPA, DPR

The effectiveness of CASQA's efforts toward this scope can be expressed in relation to management questions established as part of Municipal Separate Storm Sewer Systems' (MS4s') program effectiveness assessments that are required in some MS4 permits. With respect to addressing urban pesticide impacts on water quality, the following two management questions are suggested for inclusion in MS4s' program effectiveness assessment:

Question 1: (Near term / Current problems) – Are actions being taken by State and Federal pesticides regulators and stakeholders that are expected to end recently observed pesticide-caused toxicity or exceedances of pesticide water quality objectives in surface waters receiving urban runoff?

Question 2: (Long term / Prevent future problems) – Do pesticides regulators have an effective system in place to exercise their regulatory authorities to prevent pesticide toxicity in urban water bodies?

This report is organized to answer these management questions and is intended to support annual permit compliance requirements for both Phase I and Phase II MS4s. It describes the year's status and progress, provides detail on stakeholder actions (by CASQA and others); and provides a roadmap / timeline showing the context of prior actions as well as anticipated end goal of these activities. This report may also be used as an element of future effectiveness assessment annual reporting.

¹³ https://www.casqa.org/sites/default/files/downloads/final_-_vision_for_sustainable_stormwater_management_-_10-07-2020.pdf

Section 2. Latest Results of CASQA Efforts

At any given time, there are dozens of pesticides with current or pending actions from the EPA or DPR. Addressing near term regulatory concerns is important because some pesticides may pose immediate threat to water quality that can lead to compliance liability for MS4s, and because some of the regulatory decisions made by EPA and DPR will last many years. For example, pesticide registration decisions are intended to be revisited on a fifteen-year cycle. To inform its engagement on near-term regulatory concerns, CASQA uses the Pesticide Watch List in the prioritization of near-term efforts (Section 2.1).

Meanwhile, CASQA and BACWA continue to work on parallel efforts to effect long-term systemic changes in the regulatory process itself (see inset). By identifying inadequacies and inefficiencies in the pesticide regulatory process, and persistently working with EPA and DPR to improve the overall system of regulating pesticides, CASQA and BACWA are gradually achieving results (Section 2.2).

2.1 NEAR-TERM REGULATORY CONCERNS

CASQA seeks to ensure that the Water Boards and EPA's Office of Water (OW) work with DPR and EPA's OPP to manage problem pesticides that are creating near-term water quality impairments. These efforts address CASQA Vision Action 1.2 as well as Phase II MS4 Program Effectiveness Assessment and Improvement Plan (PEAIP) Management Question 1 regarding observed pesticide-caused toxicity or exceedances of pesticide water quality objectives in surface waters receiving urban runoff.

Assessment Question 1: (Near term / Current problems) – Are actions being taken by State and Federal pesticides regulators and stakeholders that are expected to end recently observed pesticide-caused toxicity or exceedances of pesticide water quality objectives in surface waters receiving urban runoff?

Answer: As detailed below, at the State level, significant progress has been made by DPR in addressing near-term and current problems with pesticides in surface waters receiving urban runoff. DPR continues to implement improved registration processes and responses to observed water quality problems. DPR also continues to implement and evaluate mitigation measures for observed problems with pyrethroids and fipronil.

At the Federal level, less progress has been made at addressing near term problems. Some early actions were taken to address pyrethroid and fipronil problems at the urging of CASQA and DPR. However, EPA does not show a clear understanding of key urban uses in its analyses, and it is still unclear if its upcoming risk management decisions for pyrethroids, fipronil, and imidacloprid and other neonicotinoids will provide any additional protection of urban water bodies.

CASQA and BACWA Continue to Coordinate Monitoring EPA and DPR Pesticide Regulatory Actions



There has been a long history of collaboration between CASQA, the Bay Area Clean Water Agencies (BACWA), and the State Water Board, as all entities seek to track and respond to pesticide regulatory actions, with the goal of avoiding pesticide-related toxicity.

CASQA and BACWA regularly track pesticide regulatory activities by EPA, DPR and other agencies. In 2021, CASQA and BACWA combined resources to track stormwater and wastewater priorities into a single Action Plan, updated monthly.

Together, CASQA and BACWA accomplish tasks that are impractical for individual member agencies. Both CASQA and BACWA are committed to continued collaborations to streamline our proactive regulatory approach. In 2022, a factsheet was developed to help member agencies understand the importance of this coordinated effort. (See Appendix A.)

2.1.1 Updated Pesticide Watch List

A key tool for identifying near-term regulatory concerns is CASQA’s Pesticide Watch List. As time permits, CASQA reviews scientific literature, government reports, and monitoring studies as they are published. This information is used to prioritize pesticides based on the most up-to-date understanding of urban uses, pesticide characteristics, monitoring, and surface water quality toxicity (for pesticides and their degradates). CASQA uses these insights to update the list each year (Table 2), which serves as a management tool to help focus efforts on the most important pesticides from the perspective of MS4 agencies.¹⁴ There are two upgrades in priority from 2021 to 2022. Dichlorvos is the basis for one new impairment in the most recent 303(d) list (spring 2022), moving it from Priority 4 to Priority 3. Naled, registered for mosquito abatements, degrades to dichlorvos (DDVP) post-application and remains at levels toxic to aquatic organisms; therefore it too has been upgraded to Priority 3. Bensulide (an organophosphate pesticide) was added as a Priority 3 due to the new 303(d) listing for an urban/rural mixed waterbody in Salinas. Bensulide has urban herbicide uses for landscaping and golf courses, is highly toxic to freshwater invertebrates, very highly toxic to marine and estuary invertebrates, and frequently sold in products in combination with oxadiazon (Priority 4 on the Watch List). There are a number of antimicrobial pesticides under review by EPA for uses in outdoor paints and coatings, the leaching of which can lead to water quality impacts; CASQA anticipates adding such pesticides to the Watch List in the coming months.

2.1.2 Description of Near-Term Regulatory Processes

Immediate pesticide concerns may arise from regulatory processes undertaken at DPR or EPA’s OPP. For example, when EPA receives an application to register a new pesticide, there may be two opportunities for public comment that are noticed in the Federal Register, as depicted in green in Figure 3. EPA’s process usually takes less than a year while DPR typically evaluates new pesticides or major new uses of active ingredients within 120 days.

Table 2. Current Pesticide Watch List (July 2022)

Priority	Basis for Priority Assignment	Pesticides		
1	Monitoring data exceeding benchmarks; linked to toxicity in surface waters; urban 303(d) listings	Pyrethroids (20 chemicals ¹⁵)	Fipronil	Imidacloprid Malathion
2	Monitoring data approaching benchmarks; modeling predicts benchmark exceedances; very high toxicity and broadcast application on impervious surfaces; urban 303(d) listing for pesticide, degradate, or contaminant that also has non-pesticide sources	Carbendazim (Thiophanate methyl) ¹⁶ Chlorantraniliprole Copper pesticides *	Creosote (PAHs) Indoxacarb Neonicotinoids (other than Imidacloprid) ¹⁷ Pendimethalin	Pesticides with dioxins impurity ¹⁸ PHMB + Zinc pesticides (including Ziram) +
3	Pesticide contains a Clean Water Act Priority Pollutant; 303(d) listing for pesticide, degradate, or contaminant in watershed that is not exclusively urban	Arsenic pesticides Bensulide	Diuron Naled Naphthenates	Simazine Silver pesticides + Trifluralin

¹⁴ The first Watch List was published by the UP3 in 2005.

¹⁵ Allethrin, Bifenthrin, Cyfluthrin, Cyhalothrin, Cypermethrin, Cyphenothrin, Deltamethrin, Esfenvalerate, Etofenprox, Flumethrin, Imiprothrin, Metofluthrin, Momfluothrin, Permethrin, Prallethrin, Resmethrin, Sumethrin [d-Phenothrin], Tau-Fluvalinate, Tetramethrin, Tralomethrin.

¹⁶ Carbendazim is a registered pesticide, and also a degradate of thiophanate-methyl

¹⁷ Acetamiprid, Clothianidin, Dinotefuran, Thiamethoxam (degrades into Clothianidin)

¹⁸ 2,4,-D, Chlorothalonil, Dacthal, Pentachlorophenol

* Used in pools, spas, and/or fountains

Priority	Basis for Priority Assignment	Pesticides		
		Chromium pesticides Dichlorvos (DDVP)		
4	High or unknown toxicity (parent or degradate) and urban use pattern associated with water pollution; synergist for higher tier pesticide; on DPR priority list	Abamectin ADBAC pesticides ¹⁹ + Antimicrobials in paints/coatings Azoxystrobin Bacillus sphaericus + Bacillus thuringiensis + Bromacil N-Bromosulfamates Busan-77 + Carbaryl Chlorinated isocyanurates+ Chlorine + Chlorine dioxide + Chlorfenapyr Chlorsulfuron DCOIT + DDAC +	Dichlobenil Dithiopyr Halohydantoins + Hydramethylnon Hypochlorites + Imazapyr Isoxaben Mancozeb Methomyl Methoprene + Methyl anthranilate + Mineral bases, weak + Mineral oil (aliphatic) + MGK-264 Novaluron Oryzalin Oxadiazon Oxyfluorfen	PCNB Peroxyacetic acid + Phenoxy herbicides ²⁰ Piperonyl butoxide (PBO) Prodiamine Propiconazole Pyrethrins Pyriproxyfen + Sodium bromide + Sodium chlorite + Sodium percarbonate + Sodium tetraborate + Spinosad + / Spinetoram Sulfometuron-methyl Tebuconazole Terbutylazine + Triclopyr Triclosan Trimethoxysilyl quats
5	Frequent questions from partners	Chloropyrifos (near zero urban use)	Diazinon (no urban use) Glyphosate	Metaldehyde
New	Priority determined on the basis of proposed urban use, aquatic toxicity, and other information in registration application.	Not known but may include the following:	Cyantraniliprole Cyclaniliprole Flupyradifurone	Nitenpyram (Neonic) Nithiazine (Neonic) Sulfoxaflor (Neonic)
None	Based on review of available data, no approved urban use or no tracking trigger as yet identified.	Most of the >1,000 existing pesticides		
Unknown	Lack of information. No systematic screening has been completed for the complete suite of urban pesticides.	Unknown		

¹⁹ Alkyl Dimethyl Benzyl Ammonium Chlorides (ADBAC) includes a family of 21 different quaternary ammonium pesticides.

²⁰ MCPA and salts, 2,4-D, 2,4-DP, MCPP, dicamba

Figure 3. EPA’s Registration Process for New Pesticides



Another regulatory process, “Registration Review,” depicted in Figure 4, is meant to evaluate currently registered pesticides about every 15 years, to account for new data available since initial registration. In general, it takes EPA five to eight years to complete the entire process. In addition to this process, pesticides are typically evaluated based on Endangered Species Act criteria. EPA regularly updates its schedule for approximately 50 pesticides that will begin the review process in a given year.²¹

Figure 4. EPA’s Registration Review – Process to Review Registered Pesticides at a Minimum of Every 15 Years.



DPR also has an ongoing, but informal review process (called continuous evaluation) that can address pesticides water pollution. If it needs to obtain data from manufacturers, DPR can initiate a formal action, called “Reevaluation.” These evaluations, mitigation measure development, and mitigation effectiveness evaluation have involved ongoing communication with CASQA and partners.

While EPA must consider water quality in all of its pesticide registration decisions, at DPR this step is not yet fully established as standard (most outdoor urban pesticide registration applications are routinely routed by DPR for surface water review, but a few – notably antimicrobial products used in storm drains – do not automatically receive this review). CASQA monitors registration applications, to identify those relevant to urban runoff, based on the Pesticide Watch List in Table 2 and use pattern/toxicity analysis for pesticides that have not previously been reviewed.

2.1.3 Key Near-Term Regulatory Activities and Progress

Table 3 presents a summary of recent CASQA and partner activities to address near-term regulatory concerns and the latest results; for additional insight regarding on-going pesticide registrations, see Appendix C. CASQA monitors the Federal Register and DPR’s website for notices of regulatory actions related to new pesticide registrations and registration reviews. This includes monitoring EPA’s dockets via the website [Regulations.Gov](https://www.epa.gov/regulations-gov) which had lost functionality during the previous administration and was recently restored thanks to CASQA and partners (see inset on next page). Since the Pesticide Watch List is not based on a comprehensive review of all pesticides, CASQA watches for additional pesticides that appear to have any of the following characteristics: proposed urban, outdoor uses with direct pathways for discharge to storm drains, high aquatic toxicity, or containing a priority pollutant. Participating in these regulatory processes can take many years to complete.

In addition, EPA’s OPP strives to update their Aquatic Life Benchmarks table on an annual basis.²² In August 2021, EPA’s Office of Pesticide Programs, Environmental Fate and Effects Division updated its pesticides Aquatic Life Benchmarks table.¹⁸ These updates included benchmarks for 9 newly registered

²¹ See <https://www.epa.gov/pesticide-reevaluation/registration-review-schedules> for schedule information.

²² <https://www.epa.gov/pesticide-science-and-assessing-pesticide-risks/aquatic-life-benchmarks-and-ecological-risk>

pesticides (and their degradates) and 81 previously registered pesticides (and their degradates) undergoing registration review. This included updates for 26 pesticides (and 16 associated degradates) on CASQA's Pesticide Watch List. Among those were the following CASQA Priority 1 pesticides:

- Fipronil
- Three fipronil degradates
- Eleven individual pyrethroids
 - Bifenthrin
 - Beta-Cyfluthrin
 - Cyfluthrin
 - Gamma-Cyhalothrin
 - Lambda-Cyhalothrin
 - Alpha-Cypermethrin
 - Beta-Cypermethrin,
 - Cypermethrin,
 - Deltamethrin
 - Esfenvalerate
 - Permethrin

CASQA and Partners Succeed in Returning Transparency to EPA's Pesticide Dockets

The federal General Services Administration (GSA) operates the website Regulations.Gov. The website has long been the primary public access point for federal agency rulemaking "e-dockets" and their contents, such as proposed and final rules, supporting data, and public comments. Despite its historical limitations, the website maintained e-docket information in a way that was organized and reasonably accessible to interested parties.

Beginning around 2019, the website began to be altered in such a way that it impaired CASQA's ability to interact with EPA pesticide dockets, including the ability to search for and receive information and to post comments. Among the issues impacting CASQA's ability to engage with EPA's dockets were as follows:

- **Subscription Service Termination:** The subscription services feature was essential to CASQA and countless interested parties attempting to track changes in federal rules and regulations. Subscribing to a docket has been the only reasonably efficient way to know when EPA posts something on the docket.
- **Search Non-Functional:** The previous version of the Regulations.Gov site was easy to search; the new version's search engine did not provide any results.
- **User Interface:** The user interface hid prior comments and obfuscated access to all documents in the dockets.

In May 2021 the Democracy Forward Foundation and eight other public interest organizations submitted a letter to GSA describing concerns with the website. This opened the door to additional comment letters from CASQA, BACWA, and the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB). Subsequently, GSA invited CASQA and partners to online meetings in September 2021 and March 2022. During that time GSA made the following progress:

- **Subscription Services Restored:** GSA restored email subscriptions for updates on a specified docket.
- **User Interface:** One-stop access to all posted comments for a given docket.

CASQA continues to coordinate with GSA lead staff as they continue to make improvements and restore prior features. Their attention to our concerns this past year was encouraging.

Table 3. Latest Results of Efforts Communicating Near-Term Regulatory Concerns to EPA²³

Regulatory Action or Concern	CASQA Efforts			Partner Support (Letters)	Outcomes and notes
	Letter(s)	Call(s) or emails	Mtg(s)		
Cyhalothrins Proposed Interim Decision (PID)	✓			BACWA	Partial Success. In the PID, EPA concluded that outdoor / urban uses present substantial risks to freshwater and estuarine/marine fish and invertebrates. As mitigation, EPA proposed label language changes. CASQA sought enhancements to the proposed label language to include a graphic to prevent spilling or dumping into storm drains, to provide clear and consistent language regarding impervious and vertical surfaces, and provide California-specific labels for outdoor structural pest control. No such requests were granted. (See Appendix C for details.)
Pyrethroids and Pyrethrins Risk Mitigation Proposal for 23 Chemicals	✓			BACWA SFBRWQCB NACWA	CASQA noted that the risk/benefits should differentiate between the 23 chemicals and among the various outdoor uses. CASQA further argued that EPA should ban outdoor uses of bifenthrin. In a subsequent PID only for pyrethrins (not pyrethroids), EPA responded that their analysis was adequate and that <i>“bifenthrin is not outstanding among pyrethroids in terms of risk quotient exceedances, aquatic invertebrate toxicity, or environmental persistence.”</i>
Permethrin Draft Risk Assessment (Antimicrobial Uses)	✓				CASQA questioned the assumption that “exposure to aquatic areas from terrestrial uses is expected to be negligible,” and recommended modeling scenarios for existing terrestrial wood preservative uses – specifically fences and decks. EPA responded that the chemical parameters for permethrin suggest the leaching rate for those scenarios would lead to negligible exposure. EPA also referenced a 2020 document that indicates permethrin is not intended for such uses despite the fact that there are labeled permethrin-containing products for such uses. (See Appendix C for details.)
Malathion National Marine Fisheries Service ESA Biological Opinion (BO)	✓				CASQA sought significant mitigation measures such as restricting malathion use in non-agricultural settings to professional applicators and restricting urban applications to avoid impervious surfaces. While the BO includes significant language to limit application on impervious surfaces, the language only applies within 300 meters of ESA-listed species habitats. (See Appendix C for details.)

²³ Color coding in this table is meant to reflect the Pesticide Watch List prioritization color coding in Table 2.

Regulatory Action or Concern	CASQA Efforts			Partner Support (Letters)	Outcomes and notes
	Letter(s)	Call(s) or emails	Mtg(s)		
Chlorothalonil Draft Ecological Risk Assessment (Antimicrobial Uses)	✓				Pending. Asked that EPA perform surface water modeling for urban uses that were omitted from the Risk Assessment including commercial, industrial, and residential outdoor uses. For the uses EPA did include in the analysis (turf and nurseries), EPA concluded that the fungicide is highly toxic to freshwater and estuarine/marine fish, freshwater and estuarine/marine invertebrates, and amphibians. On that basis, CASQA requested that EPA (1) develop a comprehensive mitigation program to reduce potential negative impacts to aquatic organisms from non-agricultural uses, particularly those uses involving antimicrobial protection for building materials and (2) prioritize mitigation measures that reduce the transport of chlorothalonil to urban runoff.
Ziram Ecological Risk Assessment and Proposed Interim Decision	✓				Partial Success. For freshwater invertebrates, EPA cited several reasons why the calculated risks were likely to be overestimates leading to a conclusion that appeared to be speculative and arbitrary, the results of which may not be sufficiently protective of aquatic life. Therefore, CASQA asked that EPA modify its risk assessment analysis for freshwater invertebrates. In addition, CASQA requested that the risk assessment be amended to include consideration of the results of a sediment toxicity study for freshwater invertebrates. In the subsequent PID, EPA agreed that additional analysis would be beneficial but that the analysis is no longer needed. Due to human health effects, EPA is proposing cancellation of the paint preservative uses of ziram as well as additional controls for non-paint materials preservative uses of ziram. CASQA submitted a subsequent letter supporting product cancelations and controls. (See Appendix C for details.)
Creosote Proposed Interim Decision	✓				EPA's Decision was made without the benefit of an Ecological Risk Assessment. This was due to a lack of data despite multiple data requests by EPA to the registrants (dating back to 2011). Therefore, CASQA asked that an Ecological Risk Assessment be completed before publishing a registration review decision. EPA responded that they did not want to delay registration review to await ecological data given the need for mitigation for worker protection. CASQA further requested that EPA seek monitoring data given that PAHs found in creosote are commonly detected in urban runoff and receiving waters. EPA concurred that PAHs are common but that the registered upstream sources are so varied so as not to allow a correlation between creosote uses and PAH pollution. (See Appendix C for details.)

Regulatory Action or Concern	CASQA Efforts			Partner Support (Letters)	Outcomes and notes
	Letter(s)	Call(s) or emails	Mtg(s)		
Diuron Ecological Risk Assessment; Diuron Antimicrobial Use Risk Assessment and PID	✓				Partial Success. CASQA sought consistency in toxicity endpoints within EPA documentation. EPA concurred that the endpoints were inconsistent between the two risk assessments and that would be addressed in the amended Ecological Risk Assessment. CASQA requested that the risk assessment be amended to include sediment toxicity study for freshwater invertebrates. EPA noted that because they are cancelling all conventional herbicidal uses, such studies are not warranted. CASQA countered that such studies are still necessary due to the antimicrobial uses. (See Appendix C for details.)
Oxadiazon Draft Risk Assessment	✓				Partial Success. CASQA supported the termination of specific uses in the Draft Risk Assessment; some of which were removed from the subsequent PID. A prohibition of liquid applications is among the mitigations still in place in the PID. (See Appendix C for details.)
Pyrethrins PID	✓			BACWA SFBRWQCB NACWA	Success! CASQA recommended that the label language be updated to include water protection statements, definitions of spot-treatments, a reduction in height of building treatments (from 3 feet to 2 feet), weather prohibitions (rain and/or wind events), and a Spanish translation for the outdoor drain discharge prohibition. EPA concurred with these suggestions. CASQA also recommended that EPA include an outdoor drain graphic. The EPA responded that “outdoor and agricultural product labels already have label statements to prevent these chemicals from reaching drainage systems.” Instead, EPA added an indoor drain graphic which is still a valuable addition.(See Appendix C for details.)

2.2 LONG-TERM CHANGE IN THE PESTICIDES REGULATORY STRUCTURE

Since the mid-1990s, CASQA (and its predecessor organization the Storm Water Quality Task Force), have worked toward a future in which the pesticide regulatory structure at the state and federal level proactively restricts pesticide uses that have the potential to cause urban water quality problems. These efforts directly relate to Phase II MS4 PEAIP Management Question 2.

Assessment Question 2. (Long term / Prevent future problems) – Do pesticides regulators have an effective system in place to exercise their regulatory authorities to prevent pesticide toxicity in urban water bodies?

Answer: Improvements in processes at EPA and especially at DPR have moved closer to that future. Many of these improvements are linked to the persistent work of CASQA and partners to educate regulators on how previous process deficiencies did not adequately address urban pesticide problems.

As detailed below, at the State level, significant progress has been made by DPR and the Water Boards in establishing a comprehensive statewide approach to utilizing pesticide regulatory authorities to prevent pesticide toxicity in urban water bodies. Overall, DPR has a system in place that is reasonably effective at addressing pesticide toxicity in urban water bodies, although improvement is needed to better coordinate this process with the requirements of the Clean Water Act and NPDES MS4 permits. DPR and the Water Board, along with CASQA and other stakeholders, are working diligently to strengthen this system and to institutionalize it. The goal is to embody this process in the State’s UPAs and the Management Agency Agreement (MAA) between DPR and the State Water Board.

At the Federal level, OPP has implemented some improvements in how it evaluates and responds to water quality problems associated with pesticides, but it does not yet do this reliably and does not have a system in place to ensure that this will happen consistently and adequately. Meanwhile, scientific studies are being conducted by USGS and EPA’s Office of Research and Development to better understand the complexities of pollution in urban stormwater. In addition, another EPA branch, the Office of Chemical Safety and Pollution Prevention (OCSPP), tasked their Pesticide Programs staff with improving the integration of the EPA and Services implementation of the Endangered Species Act.

2.2.1 Focus on EPA’s Federal Endangered Species Act

In April 2022, EPA published their “first-ever comprehensive workplan to address the decades-old challenge of protecting endangered species from pesticides.”²⁴ The workplan presents a vision and four strategies to approach this challenging effort to protect endangered species while protecting public health (see callout box at right).²⁵

CASQA communicated directly with OCSPP’s Deputy Assistant Administrator for Pesticide Programs to advance the importance of urban stormwater uses and the need for mitigations to clearly tie to risk analysis findings, targeting specific uses and products.

EPA

**Balancing Wildlife Protection and Responsible Pesticide Use:
How EPA’s Pesticide Program Will Meet its Endangered Species Act Obligations
2022**

- Strategy 1: Meet ESA Obligations for FIFRA Actions
- Strategy 2: Improve Approaches to ESA Mitigation
- Strategy 3: Improve Interagency Consultation Process
- Strategy 4: Improve Stakeholder Engagement

²⁴ <https://www.epa.gov/newsreleases/epa-announces-plan-protect-endangered-species-and-support-sustainable-agriculture>

²⁵ For complete document see https://www.epa.gov/system/files/documents/2022-04/balancing-wildlife-protection-and-responsible-pesticide-use_final.pdf.

In addition, in June, EPA hosted an Environmental Monitoring Public Meeting (EMPM), the focus of which was the Endangered Species Act and solutions to avoid, minimize or offset potential effects from pesticides to endangered and threatened species and designated critical habitats. CASQA representatives prepared an abstract (see inset) and was subsequently invited to speak. More than 200 participants, including staff from OCSPP Pesticide Programs, convened for the online meeting.

The primary message CASQA representatives conveyed was that practical ESA mitigations specific to urban users are necessary, feasible, and cost-effective. CASQA's presence at the meeting was key, given that other presenters represented registrants and agricultural users. CASQA was the single presentation to make connections between urban uses and endangered species. The presentation included numerous examples of effective mitigations, including DPR's strict limitations to structural use of fipronil by licensed, trained users. The presenters concluded with the following:

- Endangered species are exposed to pesticides used in urban areas via wastewater and urban runoff;
- Desktop studies and modeling can identify and prioritize specific urban pesticide uses for mitigation actions;
- Advanced treatment of pesticides in wastewater and urban runoff is not a feasible mitigation strategy;
- Pesticide label changes are only effective for licensed & trained users; and
- Sale and use restrictions most effective mitigation option for products designed for unlicensed/untrained pesticide users.

CASQA sought to educate all participants, particularly EPA staff, that these mitigations cannot be initiated at the local level and thus require EPA to enact these source control measures (See Appendix B).

2.2.2 Focus on California's Urban Pesticides Amendments (UPA)

In 2014 the State Water Board made a strategically important decision to institutionalize its commitment to work closely with DPR and EPA to utilize pesticide regulatory authority as the primary mechanism for preventing and responding to impairments of receiving waters linked to current use pesticides in urban runoff.

CASQA Representatives Invited to Present at EPA's Environmental Modeling Public Meeting (EMPM) – Topic: Endangered Species Assessment, June 23, 2022



Tammy Qualls, M.S., P.E (Qualls Environmental Consulting); Kelly Moran, Ph.D (San Francisco Estuary Ins Stephanie Hughes, M.S., P.E. (Santa Clara University); and Armand Ruby, M.S. (Armand Ruby Consulting).

Abstract: State water regulators are required to ensure compliance with the Endangered Species Act (ESA) via authority allocated by the Clean Water Act (CWA) under the NPDES permit program. Local agencies must comply with the NPDES program. Since they cannot regulate the use and sale of pesticides in their local area, they have had to develop practical measures to avoid, minimize, or offset chemicals of concern. Advanced treatment of pesticides in wastewater and stormwater is costly and often unfeasible. Local agencies have instead focused on targeted mitigation of specific chemicals at their source. Source control has led to reduced concentrations of chemicals at publicly owned treatment works (POTWs) and in stormwater. The State of California Department of Pesticide Regulation (CA-DPR) has performed modeling of specific label language changes for the pesticide fipronil to evaluate how changing the width of the application spray or the frequency of application can alter the concentration of fipronil in surface water. This type of modeling of changes in label language allows CA-DPR to focus mitigations on quantifiable results that minimize the impact to aquatic life.

To accomplish this goal, the State Water Board established an urban pesticides reduction project (now titled the Urban Pesticides Amendments or UPA) as a top priority project under the comprehensive stormwater strategy it adopted in December 2015, known as “Strategy to Optimize Resource Management of Storm Water” or STORMS.²⁶ CASQA representatives have been participating actively in the development of the Urban Pesticide Amendments since their inception.

The State Water Board continues to work towards developing the UPA which may be developed as separate, standalone policy or, be incorporated into the Water Quality Control Plan for Inland Surface Waters, Enclosed Bays, and Estuaries, and the Water Quality Control Plan for Ocean Waters of California (once it is established). In mid-2019, DPR and the State Water Board signed a major update to their formal MAA that memorializes their existing systems and growing cooperation and lays out the steps they are taking toward a “unified and cooperative program to protect water quality related to the use of pesticides.” The State Water Board STORMS staff indicate that communication with DPR staff regarding the UPAs has been enhanced by the MAA and that the two agencies meet regularly.

CASQA continues to work closely with STORMS staff on the UPA as an effective path to solving urban toxicity and to support urban stormwater capture and use. In 2022, STORMS staff held several meetings with stakeholders, including CASQA representatives.. CASQA provided the STORMS staff with input regarding potential options for evaluating the effectiveness of the UPA in addressing MS4 pesticide discharges to support identification of compliance pathway options for municipal stormwater permits. STORMS staff presented at the October 2021 CASQA conference, and a STORMS staff member typically attends each TSC meeting, providing updates and accepting feedback.

According to STORMS staff, a draft UPA is expected to be issued and available for comment in spring 2023.

2.2.3 CASQA Participation in Federal and State Advisory Groups

As presented in Table 4, CASQA remains actively involved with various agencies and advisory groups that affect pesticide use and pest management in urban areas. CASQA’s long-time state-level leadership is now complemented by a new federal opportunity (see inset at right).

Urban Stormwater Representation at OPP

In 2022, Dave Tamayo, was appointed to the EPA’s Pesticide Program Dialogue Committee (PPDC), on which he previously served from 2010 to 2016. Mr. Tamayo is a long time member of the TSC subcommittee and CASQA and recently retired from Sacramento County. Mr. Tamayo has been approved by the CASQA Board as its official representative to this committee. The 40-person committee, chaired by the Director of OPP, includes representatives from growers, industry, environmental, public health, farmworkers, as well as state/local/tribal government. This is expected to be an important opportunity to include urban stormwater concerns in federal level dialogue. Mr. Tamayo has placed urban pesticide concerns on the PPDC’s list of potential future agenda items.

²⁶ STORMS’ overall mission is to “lead the evolution of storm water management in California by advancing the perspective that storm water is a valuable resource, supporting policies for collaborative watershed-level storm water management and pollution prevention, removing obstacles to funding, developing resources, and integrating regulatory and non-regulatory interests.” (http://www.waterboards.ca.gov/water_issues/programs/stormwater/storms/)

Table 4. Participation in Federal and State Efforts to Support CASQA's Goals

Agency or Conference	Latest Outcomes
EPA's Pesticide Program Dialogue Committee (PPDC)	<p>The PPDC holds biannual public meetings. At the May 2022 meeting, key CASQA topics included:</p> <ul style="list-style-type: none"> • A discussion of label reform, including digitization and standardization; • An update on the Endangered Species Act Workplan by the Deputy Assistant Administrator for Pesticide Programs for Office of Chemical Safety and Pollution Prevention.
DPR's Pest Management Advisory Committee (PMAC)	<p>Participation on the PMAC has resulted in expanded focus by DPR on urban pest management and water quality issues and generated funding for urban IPM research and implementation programs.</p>
DPR's Sustainable Pest Management Work Group (SPM)	<p>DPR formed this work group in 2021. The goal of the SPM is "to develop a recommended roadmap with ambitious, measurable goals to practically achieve the state's vision to accelerate a system-wide transition to safer, more sustainable pest management."²⁷ Two CASQA members serve as invited members of the Urban Subgroup of the SPM. Formal release of the SPM draft roadmap for public comment is expected to occur later in 2022.</p>

²⁷ https://www.cdpr.ca.gov/docs/pestmgmt/sustainable_pest_management_workgroup.htm

Section 3. CASQA's Approach Looking Ahead

At any given time, EPA and DPR may be in the process of evaluating and registering various pesticides for urban use. CASQA will continue to track and engage in EPA and DPR activities, with a focus on top priority active ingredients (as identified in the annual Pesticide Watch List) and sharing relevant urban runoff information and CASQA's water-quality specific expertise with pesticides regulators. Key documents to be reviewed will include risk assessments and risk management proposals with an eye toward ensuring that pesticide regulators have and consider accurate information on relevant factors in urban areas such as pesticide use patterns, urban pollutant transport mechanisms, and receiving water conditions. CASQA strives to ensure that pesticide regulators have access to relevant information such as monitoring data, water quality regulatory requirements, and urban runoff agency compliance liabilities and cost information. As necessary, CASQA will continue to recommend changes in an individual pesticide's allowable uses or use instructions, request consideration of impacts on water bodies receiving urban runoff, and/or ask that regulators fill critical data gaps by obtaining more data from manufacturers. As resources allow and circumstances warrant, CASQA will continue to collaborate with wastewater organizations (such as BACWA), other water quality stakeholders, and the Water Boards in commenting on EPA and DPR actions.

In the coming year, CASQA will continue to address near-term pesticide concerns and seek long-term regulatory change. Although changes at the federal level are important for fully achieving CASQA's goal of protecting water quality through the effective use of pesticide regulations, until there is a more favorable situation at that level, we will continue to focus our efforts on solidifying progress at the state level. In the coming year, CASQA will continue engagement on specific regulatory actions for priority pesticides at the federal level, while continuing the strategic focus on supporting State adoption of the UPAs. CASQA's current priority activities are as follows:

- (1) Continue collaboration with DPR to address near-term regulatory concerns, while seeking OPP and OW actions to reduce inconsistencies:
 - 💧 Ensure DPR action on fipronil water pollution is completed, including effective professional user education about restrictions on its outdoor urban use.
 - 💧 Ensure DPR enforces mitigation measures for pyrethroids and fipronil, and adopts additional measures as necessary.
 - 💧 Ensure the state continues to conduct surveillance monitoring to evaluate pyrethroids and fipronil mitigation effectiveness and to evaluate occurrence of new threats like imidacloprid and other neonicotinoid insecticides.
 - 💧 Continue to encourage EPA to complete scientific groundwork and to identify and implement pyrethroids, fipronil, malathion, and imidacloprid mitigation measures, recognizing that it is likely that necessary mitigation cannot readily be implemented entirely by DPR.
- (2) Seek long-term changes in the pesticide regulatory structure:
 - 💧 Leverage success at the state level and continue to be a key stakeholder in the STORMS project to adopt the statewide UPA. Through this process, CASQA will work with other stakeholders to implement the planned restructuring of California's urban surface water pesticides monitoring to increase its effectiveness and improve coordination.
 - 💧 Encourage and assist the Water Board to continue to implement its MAA with DPR and increase its leadership role in preventing and mitigating pesticide impairments through more effective pesticide regulation at the state and federal level.
 - 💧 Seek procedure changes such that DPR continues to refine its registration procedures to address remaining gaps in water quality protection.
 - 💧 Seek increased transparency of DPR regulatory activities, including timely access to scientific evaluation reports that are the basis of registration decisions.

CASQA will continue to seek opportunities to coordinate on high priority regulatory actions, with the Water Boards and other water quality stakeholders such as POTWs and non-profits, to take advantage of efficiencies, increase effectiveness, and ensure that the water quality community has a consistent message. Table 5 presents CASQA's activities anticipated for the coming year; CASQA will conduct these activities as priorities indicate and resources allow. Table 6 summarizes upcoming regulatory action items that are likely to proceed and may require CASQA attention in the coming year.

Table 5. CASQA Pesticide Activities

Activity	Purpose	
Regulatory Tracking	Track Federal Register notices	Identify regulatory actions for high priority active ingredients that may require review.
	Track DPR notices of registration applications and decisions	Identify pesticides meriting surface water review that are not within DPR’s automatic routing procedures, identify gaps or potential urban runoff-related problems with current DPR evaluation or registration plans other regulations, procedures, and policies.
	Track activities at the Water Boards	Identify opportunities for improvements in TMDLs, Basin Plan Amendments, and permits.
	Review regulatory actions, guidance documents, and work plans	Identify potential urban runoff-related problems with current EPA evaluation or registration plans, other regulations, procedures, and policies.
Regulatory Communications	Briefing phone calls, informal in-person meetings, teleconference meetings, and emails with EPA and DPR	Information sharing about immediate issues or ongoing efforts; educate EPA and DPR about issues confronting water quality community. Provide early communication on upcoming proceedings that help reduce the need for time-intensive letters.
	Convene formal meetings, write letters, and track responses to letters	Ensure current pesticide evaluation or registration process accurately addresses urban runoff and urban pesticide use and management contexts. Take advantage of opportunities to formally provide information and suggest more robust approaches that could be used in future regulatory processes. Request and maintain communication on mitigation actions addressing highest priority pesticides.
Advisory	Serve on EPA, DPR, and Water Board policy and scientific advisory committees	Provide information and identify data needs and collaboration opportunities toward development of constructive approaches for managing pesticides.
Educational	Presentations to and informal discussions with EPA, DPR, Water Board, CASQA members,	Educate EPA, DPR, Water Board, and CASQA members about the urban runoff-related shortcomings of existing pesticide regulatory process, educational efforts to support process improvements, and report on achievements. Encourage research and monitoring programs to address urban runoff data needs and priorities. Stimulate academic, government, or private development of analytical and toxicity identification methods to address anticipated urban runoff monitoring needs. Inform development of new pesticides by manufacturers and selection of pesticides by professional users.
	Develop and deliver public testimony	Educate Water Board members about the problems with existing pesticide regulatory process, encourage change, and report on achievements.

Activity		Purpose
Monitoring and Science	Update Pesticide Watch List based on new scientific and regulatory information	The Pesticide Watch List (Table 2) serves as a management tool to prioritize and track pesticides used outdoors in urban areas.
	Data analysis of DPR/SWAMP/USGS/MS4 monitoring, pesticide use data, and information from scientific literature	Summarize data to educate CASQA members and water quality community, Water Boards, DPR, and EPA.
Reporting	Prepare Monthly Action Plans	Coordinate CASQA's regulatory actions with partners
	Prepare Annual Report to describe the year's status and progress, provide detail on stakeholder actions, and the context of prior actions as well as anticipated end goal of these activities.	Provide CASQA's members with focused information on its efforts to prevent pesticide pollution in urban waterways. The document serves annual compliance submittal for both Phase I and Phase II MS4s. It may also be used as an element of PEAIPIs and future effectiveness assessment annual reporting.

Table 6. Anticipated Upcoming Opportunities for Pesticides Regulatory Engagement

EPA Pesticide Registration Review (15-year cycle) (organized chronologically by anticipated next regulatory step) ²⁸			
Priority	Topic	Item	Urban Runoff Concern
unknown	New Antimicrobials	various	Varied; many of these pesticides are showing up for the first time at the PID level; review is needed to screen these for water quality issues
1	Fipronil	PID	Monitoring data; Anticipated 303(d) listings
2	Dacthal (DCPA)	RA	303(d) listings (dacthal, dioxins); Contains CWA Priority Pollutants (dioxins)
3	Sodium pyrethione	PID	Paint additive
4	Dicamba	RA	Phenoxy herbicide
1	Etofenprox	PID	Pyrethroid
2	Thiophanate methyl/ Carbendazim (MBC)	PID	Degradate toxicity, use patterns
4	2,4-D	PID	Phenoxy herbicide

²⁸ RA = Risk Assessment; PID = Proposed Interim Decision

4	Carbaryl	PID	Toxicity; monitoring data
4	Tebuconazole	PID	Fungicide
4	Chlorothalonil	PID	Central Valley Water Board high relative risk; 303(d) listings (dioxins); Contains CWA Priority Pollutant (Dioxins); DPR monitoring priority
4	Mancozeb	PID	Central Valley Water Board high relative risk
4	PCNB	PID	Dioxin impurity
4	Peroxy Compounds (peroxyacetic acid)	PID	Fountain chemical
2	Copper HDO	PID	303(d) listings (copper); TMDLs (copper); Contains CWA Priority Pollutant (Copper)
4	ADBAC group	RA	Antimicrobial
4	DDAC group	RA	Pool chemical
4	Isothiazolinones (includes DCOIT, BBIT, BIT, MIT, OIT)	RA	Antimicrobials. Uses include paints.

Other EPA-related Items

- U.S. EPA “[Increasing Consistency and Transparency in Considering Costs and Benefits in the Rulemaking Process](#)” affects how the U.S. EPA uses cost and benefit analysis in setting pollution standards. Rule proposal was expected in 5/19.
- Proposed rule to eliminate some OPP Federal Register Notices (was anticipated September 2018 according to U.S. EPA semi-annual regulatory agenda)
- U.S. EPA [Update to Guidelines for Deriving Aquatic Life Water Quality Criteria](#). Draft scoping document external peer review is next step. Seeking OPP engagement.

DPR New Pesticide Product Registration Decisions

New Product Applications (Active ingredient – product name)	Why tracking	Current Status
1R-Phenothrin - by MGK	Outdoor uses	Noted on EPA docket. Not yet in DPR Notice.
Tetraniliprole	Outdoor uses	Noted on EPA docket. Not yet in DPR Notice.
Momfluorothrin (and Phenothrin) - S-1563	New urban pyrethroid	2014: DPR confirmed that Surface Water would review.
Momfluorothrin (and Cypermethrin) - MGK Products	New urban pyrethroid	2014: DPR confirmed that Surface Water would review.
Alpha-cypermethrin - Fendona CS	New urban pyrethroid	2018: DPR confirmed that Surface Water would review.

2022 Pesticide Annual Report and Effectiveness Assessment

Transfluthrin - Bayer Product	New urban pyrethroid. Indoor and outdoor uses	Noted on EPA docket. Not yet in DPR Notice.
Fipronil and Bifenthrin - Taurus Trio G	Landscaping product	2017: DPR confirmed that Surface Water would review.
Fipronil - Termidor HP II	Termite product	2018: DPR confirmed that Surface Water would review.
Fipronil - MGK Formula 3115	Outdoor yellow jacket product	2019: DPR confirmed that Surface Water would review. 7/9/21: Notice of Final Decision posted. Product limited to bait stations.
Bifenthrin, Novaluron, and pyriproxyfen - Duraflex CS	Use on non-residential sites	2019: DPR confirmed that Surface Water would review.
Indoxacarb - Doxem Precise	New aerated indoxacarb powder	2019: DPR confirmed that Surface Water would review.
Zinc, Thiabendazole and 2-pyridinethiol-1-oxide – Ultra-Fresh DW-30	Potential use in vehicle tires	DPR is asking the registrant of that product that should not have been approved for use in rubber to change the product label to again say “not for use in California” with regard to the use in rubber.
Fipronil – Imidacloprid: Fuse Foam by Control Solutions, Inc.	Indoor/outdoor fipronil-imidacloprid foam	BACWA/CASQA have been tracking this product since 2017. 7/2/2021: DPR issues notice to deny, noting several problems with the label. 5/27/2022: DPR confirmed that the label that they are reviewing is the same as the label available on the EPA website.
Bifenthrin / Acetamiprid F9228-2 RTU insecticide / miticide by FMC	Outdoor and indoor uses. Label allows liberal spraying.	1/5/2022: DPR confirmed that the Surface Water Group would review.

Other DPR-related Items

- Registration Application Surface Water Reviews – continue to follow up on communications requesting review of all storm drain products and outdoor antimicrobials

Water Boards

- [State Water Board Urban Pesticides Amendments](#). State Water Board workshop/public comment period and decision expected in 2023.
- Pesticides 303(d) listings
- Pesticide TMDL implementation requirements for permittees

Other Statewide Items

- [**DPR Sustainable Pest Management Workgroup**](#). Workgroup has the goal of establishing measurable goals to achieve the state’s vision of safer, more sustainable pest management. A subgroup is focusing on urban pesticides. The public will have opportunity to comment once the draft workplan is released in Summer 2022.
 - [**California Department of Food & Agriculture Program EIR on invasive species**](#) control covering potential broadcast pesticide applications urban areas of multiple priority pesticides. [**October 2021 update**](#): California’s Court of Appeal has ruled that a statewide pesticide-spraying program violates the law by failing to study and minimize the threats from pesticides and to properly inform the public about the risks of spraying. The ruling noted that the department did not analyze or disclose the health and environmental harms of the more than 75 pesticides. The court decision also noted a lack of public notice. Furthermore, they did not evaluate local impacts or allow opportunity for affected communities to opt out. **June 2022 Update**: New ruling by Sacramento County Superior Court orders the state to halt spraying.
-

Appendix A

CASQA / BACWA Fact Sheet

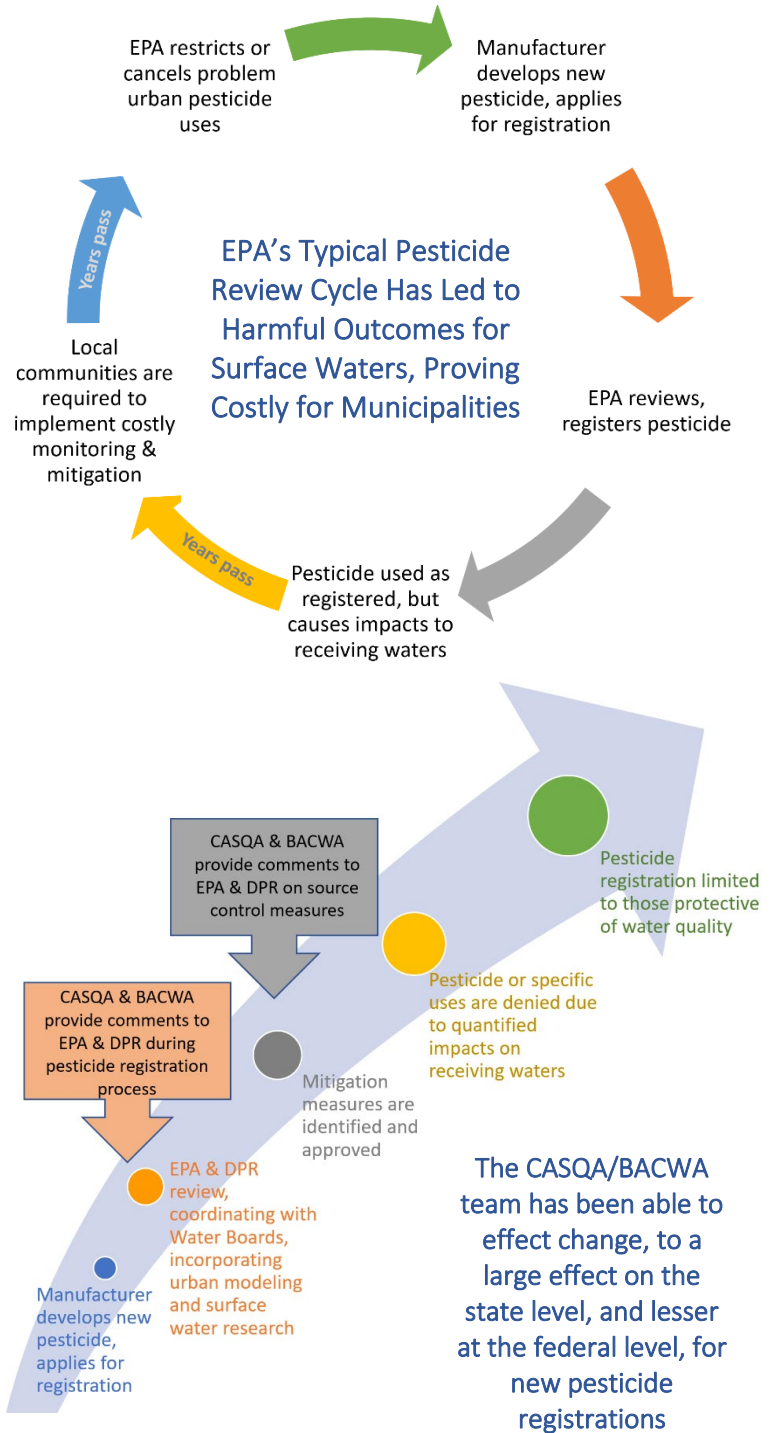
Urban Pesticides Threaten Ecosystem Health in California Watersheds

Pesticides including insecticides, herbicides, antimicrobials, fungicides, and rodenticides are a threat to aquatic ecosystems when they reach waterways through wastewater and stormwater. The Clean Water Act holds local agencies responsible for pollutant toxicity (including pesticides) in surface water, including the cost of monitoring and mitigation. Agencies also face substantial costs to comply with pesticides-related Total Maximum Daily Loads (TMDLs), Basin Plan Amendments, California State Water Board Toxicity Provisions, and additional permit requirements. Compliance costs for public agencies can continue years after a pesticide is banned (e.g. diazinon, chlorpyrifos) as the pesticides can remain in the aquatic environment long after they are used.

Unfortunately, local agencies only have authority over their own use of pesticides; they are pre-empted by state law from regulating pesticide sales or use by consumers and businesses. Instead, pesticides are regulated by the United States Environmental Protection Agency (EPA) and the California Department of Pesticides Regulation (DPR), which in some cases have not adequately protected urban discharges and water bodies from toxicity. Several pesticides are present in urban water bodies throughout California at concentrations above aquatic toxicity thresholds.¹

CASQA and BACWA Provide Input to EPA and DPR at Crucial Intersections

Since 2011, BACWA and CASQA have collaborated to educate EPA and DPR staff regarding wastewater and urban stormwater obligations. Such collaborations require information sharing, coordination of communications with pesticide regulators, and contributing staff time and other resources in support of the shared goal. Both organizations coordinate with the State and Regional Water Boards (Water Boards) to address the impacts of pesticides efficiently and proactively through the statutory authority of DPR and EPA. Furthermore, we share our findings with other partner agencies and stakeholders so that our voices are magnified.²



¹ California Integrated Report (Clean Water Act Section 303(d) List and 305(b) Report) https://www.waterboards.ca.gov/water_issues/programs/water_quality_assessment/2020_2022_integrated_report.html

² Partners include National Association of Clean Water Agencies and National Municipal Stormwater Alliance.

CASQA and BACWA Accomplish Tasks that are Impractical for Individual Member Agencies

Since local agencies cannot locally regulate pesticides, BACWA and CASQA work to reduce pesticides in the aquatic environment by:

- **Educating Regulators Regarding Wastewater and Urban Stormwater Issues.** Half of all pesticide use occurs in urban areas, yet pesticide work at EPA is largely focused on agricultural uses. We educate EPA on the impacts of indoor and outdoor urban uses, and call attention to the pesticide-related challenges facing local public agencies.
- **Tracking and Prioritizing Pesticide Regulatory Action.** We use a multifaceted method for pesticide tracking and action, with the goal of reducing the impact of priority pesticides on the aquatic environment.
- **Sharing Science.** CASQA and BACWA share new scientific studies and monitoring data with EPA and DPR, essential to science-based regulation.
- **Identifying Data Gaps and Faulty Assumptions.** Due to its agricultural focus, EPA frequently omits key outdoor uses or indoor sources with direct paths to the sewer. EPA's pesticide use assumptions are sometimes incongruent with known use practices in California. Omitting key urban uses and associated aquatic risks prevents regulatory actions that would reduce toxicity in wastewater and stormwater.
- **Analyzing Monitoring Data.** We review urban watershed and POTW effluent monitoring data to identify pesticides that are exceeding or approaching aquatic toxicity thresholds.
- **Recommending Source Control Strategies to Prevent Harm.** Once EPA identifies potential for harm to aquatic organisms, it is open to discuss source control alternatives (which EPA refers to as mitigation) to prevent such harm. At that point we identify and recommend source control measures that could reduce such impacts.

Working Together, BACWA and CASQA Get Results

- **Through our cross-agency collaboration, DPR has improved pesticide registration.** DPR now has permanent stormwater and wastewater monitoring programs, and a permanent process to protect both stormwater and wastewater when new pesticides are registered.³
- **We offer unique insights.** Without CASQA and BACWA on the pulse of DPR and EPA's data analysis and modeling, the only feedback might be from manufacturers unaware of the regulatory and water quality challenges posed by their products.
- **BACWA/CASQA feedback has led to improved assessments and improved source control:**
 - EPA improved label language for hundreds of pyrethroid products, including a pictogram provided by a BACWA member agency (at right) (stormwater and wastewater)
 - DPR adopted pyrethroids regulations, including restrictions on outdoor residential use (stormwater)
 - DPR adopted fipronil restrictions that are expected to reduce fipronil in urban runoff more than 90 percent (stormwater)
 - EPA labeling requirements that protect urban water quality are consistently being required for pool and spa treatments (stormwater and wastewater)
 - EPA developed root control chemical POTW notification requirements (wastewater)
 - DPR required manufacturers to fund the POTW pyrethroids survey, providing monitoring data necessary for EPA's first-ever POTW-specific detailed evaluation in its Pyrethroids Registration Review (wastewater)
 - EPA improved evaluations for hydramethylnon, which resulted in label language mitigations: environmental hazards, rain advisory, and avoidance of broadcast applications on impervious surfaces (stormwater)




This Work Remains Essential

CASQA and BACWA have spent more than a decade seeking restrictions for the highest priority pesticides. The pesticides review process—driven by EPA—often lasts more than a decade, with each pesticide open for re-registration every 15 years. California does not have a periodic review process. While our actions may take years to see results, these tasks demonstrate our effort to influence State and federal regulators to adequately protect California's urban waterways.

³Water Quality Impairments Due to Aquatic Life Pesticide Toxicity: Prevention and Mitigation in California, USA, Kelly Moran, Brian Anderson, Bryn Phillips, Yuzhou Luo, Nan Singhasemanon, Richard Breuer, Dawit Tadesse, *Environ Toxicol Chem* 2020;39:953–966. <https://setac.onlinelibrary.wiley.com/doi/abs/10.1002/etc.4699>


Appendix B: CASQA / BACWA Presentation at EPA Environmental Monitoring Public Meeting



Practical measures and mitigations to reduce pesticide effects on endangered and threatened species in urban areas

Tammy Qualls, M.S., P.E (Qualls Environmental Consulting); Kelly Moran, Ph.D. (San Francisco Estuary Institute); Stephanie Hughes, M.S., P.E. (Santa Clara University); and Armand Ruby, M.S. (Armand Ruby Consulting).


Our work on this topic is funded by the Bay Area Clean Water Agencies and the California Stormwater Quality Association



Corresponding author: Tammy Qualls, M.S., P.E
Qualls Environmental Consulting
tammyqualls@gmail.com

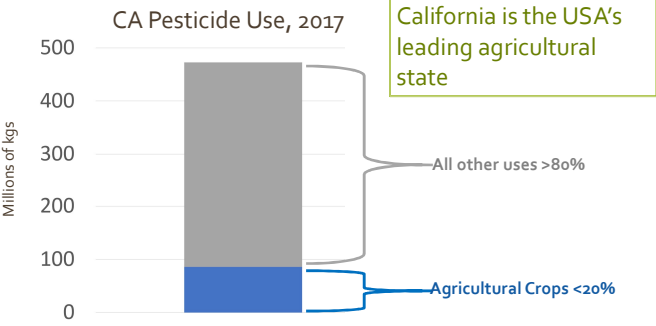
Endangered species habitat often overlaps with urban areas: **salmon example**

- Map shows urban areas on west coast of USA
- Darker brown areas are higher population density
- Green outline is Critical Habitat Designations for West Coast Salmon and Steelhead



Sources: NASA, NOAA Fisheries

Most pesticide use in California is **non-agricultural**



Category	Percentage
Agricultural Crops	<20%
All other uses	>80%

Sources: CDPR databases, Moran et al.(2020)

Non-agricultural uses of pesticides are ubiquitous

- Structural and landscape insecticides and herbicides
- Antimicrobial/ fungicides
- Industrial biocides
- Pesticides added to non-pesticide products, like building paint
- Disinfectants for drinking water and wastewater



Image credit: Tammy Qualls

Sources: CDPR databases, Moran et al. (2020)

Pesticides flow to surface waters through both indoor drains *and* outdoor runoff

Sewer



Storm Drain



Images sources: K. Moran, City of Palo Alto, and USGS

Pesticides create local agency liabilities

- Must comply with Clean Water Act
- Permit required for both wastewater and urban runoff discharges to Waters of the US
- Permit issuance requires ESA compliance

There are hundreds of current use pesticide impairments in CA alone, each requiring a Total Maximum Daily Load and discharge limit.



Ineffective mitigation example: Advanced water treatment

- Conventional treatment generally ineffective for pesticides
- Advanced treatment unrealistic
 - Costly and energy-intensive
 - No single treatment for all pesticides
 - Additional challenges with urban runoff due to large volume and episodic nature
 - Reverse osmosis concentrate can exceed toxicity thresholds for some pesticides, impacting disposal alternatives



Photo credits: City of Palo Alto

Sources: Sutton et al. (2019), UC Berkeley, Stanford, San Francisco Estuary Institute (2020).

Appendix B: CASQA / BACWA Presentation at EPA Environmental Monitoring Public Meeting



Ineffective mitigation example: product label changes for unlicensed/untrained users

- Unlicensed/untrained pesticide users typically don't read product labels
- Users that do read labels, usually don't read application instructions

Types of urban pesticide users	Percentage of pesticide use by user type (CA)
Licensed applicators	Small (<2%)
Trained applicators (e.g., water/wastewater treatment plant operators)	About half
Unlicensed/untrained applicators	About half

Sources: Dugger-Webster A, et al. (2018), Edworthy J, et al. (2004), Templeton, S., et al. (1998), Lockwood JA, et al (1994), Rother H-A, (2018), CDPR databases.



Mitigations that do work: targeted mitigation

- Pollution prevention is a common and effective mitigation approach
- Effective pollution prevention mitigation targets specific chemicals and particular users

Pollution Prevention means eliminating or reducing the amount and toxicity of potentially harmful substances at their sources, prior to generation, treatment, off-site recycling or disposal. It emphasizes preventing or minimizing pollution, rather than controlling it once it is generated.



Mitigation example 1: Fipronil for structural pest control CA Department of Pesticide Regulation

- Fipronil is toxic to aquatic invertebrates; monitoring data
- Modeled existing uses
 - Identified reductions needed to protect water quality
 - Identified primary source in urban runoff
 - Calculated reductions necessary
- Worked with users to confirm that proposed mitigation control pests



Image Source: Les Greenberg, UC Riverside

Focused, science-based label changes for licensed users expected to succeed

Source: Burant, A. et al. (2017).



Mitigation example 2: silver in wastewater effluent

- Silver impairment identified in San Francisco Bay and other CA waters
- Silver and other metals impact clam population and size
- Desktop studies found the main silver sources were discharges to wastewater treatment plants from photo processing and silver plating
- Wastewater agencies developed targeted mitigation:
 - Effluent limits and monitoring for large users
 - Silver waste recovery, onsite treatment/offsite disposal for small photo processors

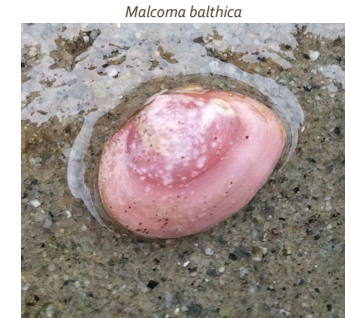
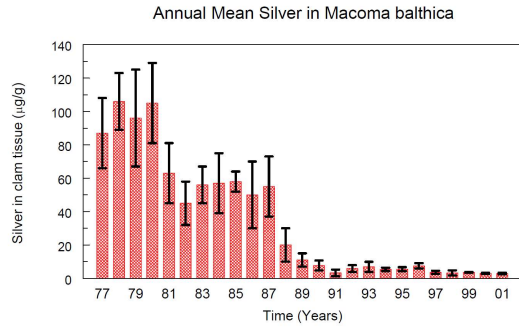


Image credit: Chanda Brietzke & Jessica Brown, <https://www.centralcoastbiodiversity.org/baltic-macoma-bull-macoma-balthica.html>

Appendix B: CASQA / BACWA Presentation at EPA Environmental Monitoring Public Meeting



Dramatic environmental response >95% silver reduction in clams and sediment near effluent discharge



Source: David, Carlos Primo C., et. al, (2002)



Mitigation example 3: Copper based root controls



- Copper impairment identified in the San Francisco Bay
- Single application **contaminates 20 million gallons of wastewater**
- Root control estimated at **5-12%** of the copper discharged to wastewater treatment plants.
- Mitigations and results:
 - ⊘ Point-of-sale public outreach generated no measurable copper reduction
 - CA DPR identified pesticide and non-pesticide alternatives
 - ✓ CA DPR prohibited sale and use of copper-based root killers in the San Francisco Bay Area.
 - Monitoring data showed a nearly 25% reduction in copper levels after prohibition enacted

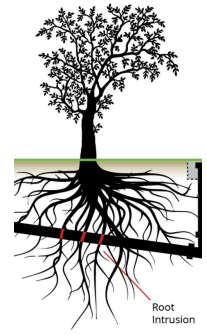


Image Source: Oro Loma Sanitary District



Mitigation example 4: tributyltin mitigation in cooling towers

- Wastewater effluent tributyltin (TBT) exceeded water quality standards in SF Bay
- TBT cooling tower biocide was only known wastewater discharge source
- Voluntary efforts unsuccessful as facilities managers proved unable to identify TBT products
- CA DPR identified many alternatives
- CA DPR prohibited sale and use of TBT cooling tower additives in the San Francisco Bay Area
- After implementation, wastewater TBT concentration below detection



Mitigation example 5: urban runoff copper and lead



- CA and WA legislation requires copper to be removed from brake pads by 2025; became de facto law for all 50 states
- 60 percent of brake pads compliant as of 2022



- Lead banned from gas in 1979 for air quality purposes
- Resulted in dramatic reductions in surface water concentrations

Appendix B: CASQA / BACWA Presentation at EPA Environmental Monitoring Public Meeting



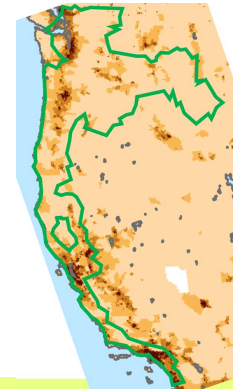
Numerous other examples of successful pollution protection programs

- **Pool, spa, and fountain maintenance** – eliminate fish kills by directing discharges to wastewater or open space like lawns
- **Dentists** – 45-75% reduction of mercury in wastewater biosolids after pollution prevention management practices program implemented in numerous US urban jurisdictions (locally-developed practices later became national EPA requirements)
- **Vehicle service facilities** – management practices to control metals, oils, solvents eliminated toxic stormwater and wastewater discharges
- **Restaurants** - grease traps eliminate sewage backups



Practical ESA mitigations specific to urban users are necessary, feasible, and cost-effective

- Endangered species are exposed to pesticides used in urban areas via wastewater and urban runoff
- Desktop studies and modeling can identify and prioritize specific urban pesticide uses for mitigation actions
- Advanced treatment of pesticides in wastewater and urban runoff is not a feasible pesticide mitigation strategy
- Pesticide label changes only effective for licensed & trained users
- Sale and use restrictions most effective mitigation option for products designed for unlicensed/untrained pesticide users



References

- Burant, A. et al. (2017). Surface Water Monitoring for Fipronil and California Mitigation Efforts. Presented at SWAMP symposium, Sacramento. Poster 42. <https://www.cdpr.ca.gov/docs/emon/ourfwrt/swposters.htm>
- David, Carlos Primo C., et. Al. (2002). USGS Near Field Receiving Water Monitoring of Trace Metals in Clams (Macoma Balthica) and Sediments Near the Palo Alto Water Quality Control Plant in South San Francisco Bay, California: 1999-2000. https://pubs.usgs.gov/of/2002/ofn04_c1ofr_final.htm
- Delavaue, Benoit (2011). The Environmental Impact Of The Retail Photoprocessing Industry In Santa Clara County: 1996 Vs. 2006. Master's Thesis. 3921. DOI: <https://doi.org/10.3197/etd.mg7e-nkdn> https://scholarworks.sjsu.edu/etd_theses/3921
- Dugger-Webster A, LePrevost CE. (2018). Following Pesticide Labels: A Continued Journey Toward User Comprehension and Safe Use, Current Opinion in Environmental Science & Health. doi: 10.1016/j.coesh.2018.03.004.
- Edworthy J, Hellier E, Morley N, Grey C, Aldrich K, Lee A. Linguistic and location effects in compliance with pesticide warning labels for amateur and professional users. Hum Factors. 2004 Spring;46(3):11-31. doi: 10.1518/hfes.46.1.11.30383. PMID: 15151153.
- Lockwood JA, Wangberg JK, Ferrell MA, Hollon JD. Pesticide labels: proven protection or superficial safety? J Am Optom Assoc. 1994 Jan;65(1):18-26. PMID: 8137948.
- Moran, K., Anderson, B., Phillips, B., Luo, Y., Singhasemanon, N., Brewer, R., and Tadesse, D. (2020). Water Quality Impairments Due to Aquatic Life Pesticide Toxicity: Prevention and Mitigation in California, USA. Environ Toxicol Chem, 39: 953-966. <https://doi.org/10.1002/etc.4699>CDPR databases, <https://www.cdpr.ca.gov/dprdatabase.htm>
- NASA, Population Density map: <https://earthobservatory.nasa.gov/images/7052/united-states-population-density>
- NOAA Fisheries, NOAA Fisheries Outline of Critical Habitat Designations for West Coast Salmon and Steelhead, <https://www.fisheries.noaa.gov/resource/document/status-esa-listings-and-critical-habitat-designations-west-coast-salmon-and>
- Rother H-A, Pesticide Labels: Protecting Liability or Health?—Unpacking "misuse" of pesticides, Current Opinion in Environmental Science & Health (2018), doi: 10.1016/j.coesh.2018.02.004.
- Sutton et al. (2019). Occurrence and Sources of Pesticides to Urban Wastewater and the Environment. Goh et al., Pesticides in Surface Water: Monitoring, Modeling, Risk Assessment, and Management ACS Symposium Series, American Chemical Society: Washington, DC, 2019.
- Templeton, S. D. Zilberman, and S. J. Yoo. (1998). An Economic Perspective on Outdoor Residential Pesticide Use. (R823342). Environmental Science & Technology: American Chemical Society, Washington, DC, 32(7):416-423.
- TriTAC comment letter to EPA, Docket ID Number EPA-HQ-OPP-2005-0558. Coppers Risk Assessments (March 27, 2006)
- UC Berkeley, Stanford, & San Francisco Estuary Institute (2020). Reverse Osmosis Concentrate Treatment Research Results and Context for San Francisco Bay. https://www.valleywater.org/sites/default/files/ROC_TechMemo_ETC_Research_0.pdf

Appendix C

Regulatory Participation Outcomes and Effectiveness Assessment Summary Tables

Table of Contents

Creosote

Cyhalothrins

Diuron

Malathion

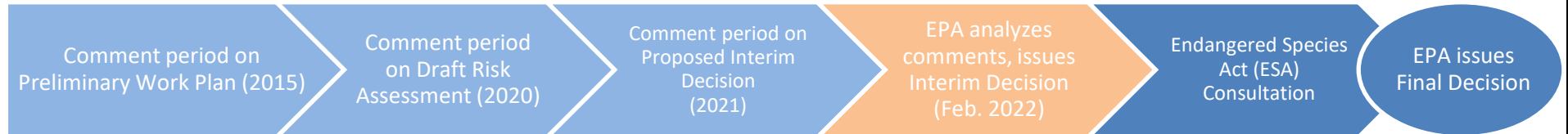
Oxadiazon

Permethrin

Pyrethrins

Ziram

Pesticide: Creosote – EPA-HQ-OPP-2014-0823
Why we care: 303(d) listings (PAHs); Contains CWA Priority Pollutants (PAHs); UP3 Priority (toxicity; use patterns)
Actions taken: CASQA sent a comment letter to EPA on the creosote Proposed Interim Decision (PID) on May 19, 2021.
Status: EPA released the Interim Registration Review Decision (ID) in February 2022.



Next steps: EPA will complete an endangered species determination and any necessary consultation with the Services.

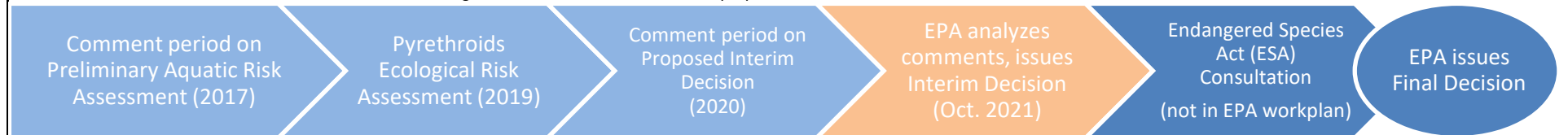
Recommendation: No action needed at this time as there is no open comment period.

CASQA 5/19/2021 Comments to EPA	EPA Response	Did EPA incorporate CASQA's comment?
EPA did not provide a draft ecological risk assessment for creosote, and did not produce required ecological studies that the EPA itself said were required. (see p.12 of EPA's Proposed Interim Decision)	<i>"The Agency does not support delaying the issuance of this interim registration review decision while ecological data are being generated, citing the important mitigation measures that will protect workers."</i> (Response to Public Comments on the Creosote Proposed Interim Decision, Dec 8, 2021, p.8)	No.
In addition to careful review and consideration of the required studies, the risk assessment should include surface water modeling using EPA's PRZM/VVWM runoff model, running under the current version of the Pesticide in Water Calculator (PWC), and including the right-of-way (ROW) scenario.	<i>"The Agency appreciates the suggestion; however, it believes there is no appropriate scenario available for the wood preservative use in the PWC. The Agency will consider the development of such a scenario in the future and is currently working on refining the modeling approaches used for estimating environmental exposures for antimicrobial pesticides."</i> (Response to Public Comments on the Creosote Proposed Interim Decision, Dec 8, 2021, p.8)	Partially, but only for consideration of future antimicrobial pesticide evaluations.
An updated ecological risk assessment for creosote should include a survey of available monitoring data for potentially toxic components of creosote, including PAHs. Such a survey should include data available from the Water Quality Data Portal (https://www.waterqualitydata.us/portal/), as well as additional data available from the California Department of Pesticide Regulation	<i>"The Agency acknowledges that PAHs are commonly detected in water monitoring data, but aquatic exposure of these compounds is associated with numerous sources including pavement, oil, and gas activities, use of coal tar sealants, storm sewer runoff, tire wear, and burning of fossil fuels and wood. As a result, the Agency cannot attribute water detections of</i>	No.

(CDPR) surface water ("SURF") database. PAH compounds are very commonly detected in samples of urban runoff and urban receiving waters.

PAHs to registered creosote uses in many cases, as was discussed in the DRA." (Response to Public Comments on the Creosote Proposed Interim Decision, Dec 8, 2021, p.8)

Pesticide: Cyhalothrins (Gamma and Lambda) – EPA–HQ–OPP–2010–0479 and EPA–HQ–OPP–2010–0480
Why we care: Priority pesticide due to toxicity, use, and monitoring data. Multiple 303(d) listings as well as adopted and pending TMDLs.
Actions taken: CASQA sent a comment letter to EPA on the cyhalothrins Proposed Interim Decision (PID) on January 11, 2021. In February 2020, CASQA also sent a comment letter to EPA on the Pyrethroids and Pyrethrins Ecological Risk Mitigation Proposal.
Status: EPA released the Interim Registration Review Decision (ID).



Next steps: EPA will complete an endangered species determination and any necessary consultation with the Services.

Recommendation: No action needed at this time as there is no open comment period.

CASQA 1/11/2020 Comments to EPA	EPA Response	Did EPA incorporate CASQA's comment?
CASQA strongly supports the "Required Label Language for Lambda-and Gamma-Cyhalothrin End-use products with outdoor, urban, non-agricultural uses". As defined in PID Appendix B, pp. 88-90, as a minimum level of mitigation required to address the known risks to aquatic species from outdoor / urban uses of cyhalothrins.	No direct response.	Yes, EPA kept the label language from the PID in the ID.
However, the Cyhalothrins PID does not provide any additional mitigation measures...to address the documented impacts of pyrethroid use in urban (non-agricultural) areas, and the risks to aquatic life of continued use of pyrethroid pesticides. This is despite significant evidence presented both in EPA's risk assessments and in our previous comment letters...consideration for possible additional mitigation measures should be afforded for each pyrethroid known through documented sources to contribute to surface water pollution.	"The Agency appreciates the comments from CASQA, SFBRWQCB, and BACWA. The Agency issued a single risk mitigation proposal to address ecological risks for 23 pesticides, which encompass the pyrethrins, synthetic pyrethroids, and pyrethroid-like insecticides, because they exhibit a common insecticidal mode of action and show similar ecological effects. Additionally, assessing these pesticides as a group would ensure a consistent approach to mitigating potential ecological risk, including providing equity to stakeholders, when implementing regulatory changes for pesticides in this group. EPA conducted a separate human health risk assessment for each chemical to account for different exposure pathways and human toxicity. The Agency has decided not to develop unique chemical-specific ecological risk mitigation for lambda-cyhalothrin and gamma-cyhalothrin at this time beyond what is already required as part of this ID. The Agency concludes that lambda-cyhalothrin and gamma-cyhalothrin provide high benefits for	No.

	controlling pests in indoor residential areas, outdoor urban areas, in agricultural crop production, and as an adult mosquito adulticide to control vectors for human disease. The Agency is requiring risk mitigation primarily to address risk to non-target invertebrates and fish. However, risks may remain to non-target organisms even after mitigation. Any remaining risks are outweighed by the benefits of lambda-cyhalothrin and gamma-cyhalothrin use.” (ID, pp. 14-15)	
<p>CASQA recommends the following enhancements to the proposed label language specified in Appendix B of the PID:</p> <ul style="list-style-type: none"> • design a clear schematic graphic for product labels to completely and effectively address prevention of product spilling or dumping into gutters and storm drains • review proposed label language text, and edit as needed to provide clear and consistent descriptions of pervious and impervious surfaces, to ensure clarity with respect to allowable exceptions, including with respect to applications to vertical surfaces, and • provide California-specific labels for outdoor structural pest control pyrethroids products that are completely consistent with California Surface Water Protection Regulations implemented by California Department of Pesticide Regulation. 	“...the Agency notes that all states, including California, are authorized to restrict pesticide use according to state requirements and standards.” (ID, pp. 15)	No.

Pesticide: Diuron – EPA–HQ–OPP– 2015–0077
Why we care: Fungicide/antimicrobial used in building products, including paint, caulks, and sealants. Also an herbicide. Highly toxic to aquatic life.
Actions taken: CASQA sent a comment letter to EPA on the Draft Ecological Risk Assessment (Draft RA) on May 7, 2021.
Status: EPA released the Proposed Interim Registration Review Decision (PID).



Next steps: EPA will issue an Interim Decision.
Recommendation: It is recommended that CASQA write a brief comment letter on the Diuron PID.

CASQA 5/7/2021 Comments to EPA (excerpt)	EPA Response	Did EPA incorporate CASQA's comment?
<p>A Chronic Sediment Toxicity Study Is Needed for Aquatic Invertebrates CASQA therefore requests that the risk assessment be amended to include consideration of the results of a sediment toxicity study for freshwater invertebrates.</p>	<p>EPA is cancelling all conventional (herbicidal) uses of diuron, so they state that this chronic sediment toxicity study is not needed.</p>	<p>No. While CASQA supports the cancellation of the conventional uses, it will remain important to complete the chronic sediment toxicity study for aquatic invertebrates due to the antimicrobial uses of diuron. EPA's evaluation of diuron for antimicrobial uses is continuing on a separate review schedule, for which CASQA last provided comments to the Draft RA in June 2021.</p>
<p>Monitoring Data Summaries Are Incomplete and Understate Diuron Surface Water Levels It is important for the risk assessments to include fully representative data for diuron in surface waters, particularly because the CDPR dataset includes a range of concentrations higher than those reported in EPA's monitoring summaries. We therefore request that the Draft ERA and Antimicrobials RA be amended to incorporate the CDPR SURF data for diuron.</p>	<p>None.</p>	<p>No.</p>

<p>Toxicity Endpoints Used in Diuron Risk Assessments Do Not Agree Across EPA Sources The toxicity endpoints used in EPA's modeling for the Draft ERA and Antimicrobials RA are not consistent, and the endpoints used in both documents are not in agreement with the Aquatic Life Benchmarks for Pesticides published on EPA's web site.</p>	<p><i>"The Agency appreciates the comments and acknowledges that there are inconsistencies in the Draft Risk Assessment for the antimicrobial uses of diuron. These inconsistencies will be addressed in the amended diuron risk assessment."</i> (Response to Public Comments on N'(3,4-dichlorophenyl)-N,N-dimethylurea (Diuron) Draft Risk Assessment on the Antimicrobial Use, p.6)</p>	<p>Yes.</p>
---	---	-------------

Pesticide: Malathion – EPA-HQ-OPP-2009-0317
Use: Insecticide
Why we care: Malathion occurs in urban watersheds at concentrations above EPA’s malathion water quality criterion.
Actions taken: CASQA commented on the Draft Biological Evaluation on June 10, 2016, the National Marine Fisheries Service Biological Opinion on July 23, 2018, and the US Fish and Wildlife Service Draft Biological Opinion on June 18, 2021.
Status: The National Marine Fisheries Service Endangered Species Act Section 7 Conference and Revised Biological Opinion was released June 30, 2022.



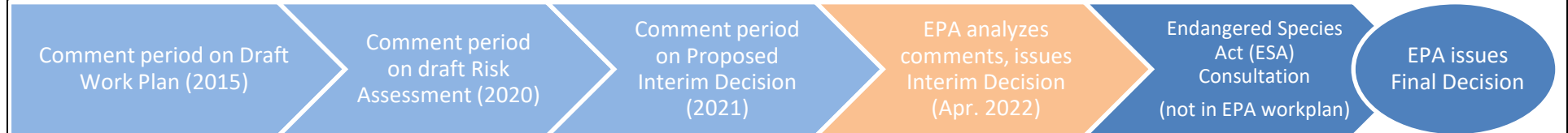
Recommendation: No action is needed at this time as there is no further opportunity for public comment.

CASQA Comments to EPA (June 2016, July 2018, and June 2021)	EPA Response (National Marine Fisheries Service Endangered Species Act Section 7 Conference and Revised Biological Opinion)	Did EPA incorporate CASQA’s comment?
Occurrence of malathion Clean Water Act 303(d) listings in urban water bodies is consistent with BiOp finding of adverse modification of critical habitat. Clean Water Act compliance assessments must be an integral part of BEs and Registration Review ecological risk assessments.	They acknowledged this linkage. (p. 718)	No.
<p>Evaluation of the proposed Reasonable and Prudent Alternatives (RPAs) in the context of urban (developed) areas. We highlight RPA approaches that are impractical or ineffective in the urban context and suggest alternatives. Mitigation is needed specifically for malathion impacts to aquatic life in developed watersheds. Suggested RPAs (through label modification) include:</p> <ul style="list-style-type: none"> • Restrict malathion use in non-agricultural settings to professional applicators. • Restrict applications in urban use sites to avoid impervious surfaces 	<p>“EPA and applicants agreed to modify the action to incorporate the draft RPA measures for all non-broadcast applications that occur within 300 m of specified ESA-listed species habitats.” (p. 897) They acknowledged that there is “limited use and exposure data on stressor of the action for non-agricultural uses of these pesticides” and “(u)ncertainty about pesticide concentrations resulting from non-agricultural uses”. (p. 1195) The report includes language to limit application on impervious surfaces (p. 131-132):</p> <ul style="list-style-type: none"> • Do not apply within 25 feet of aquatic habitats (such as, but not limited to, lakes, reservoirs, rivers, permanent streams, wetlands or natural ponds, estuaries, and commercial fish farm ponds). 	<p>Unclear. Although the language limiting the use of malathion on impervious surfaces is comprehensive, the language only applies within 300 meters of ESA-listed species habitats. It is unclear how EPA plans to implement this language. It is also not clear if the 300 meter limitation also includes non-agricultural sites,</p>

	<ul style="list-style-type: none"> • Do not apply directly to, or allow the product to enter sewers or storm drains, or to any area like a drain or gutter where drainage to sewers, storm drains, water bodies, or aquatic habitat can occur. • Do not apply directly to impervious horizontal surfaces such as sidewalks, driveways, and patios except as a spot or crack-and-crevice treatment. • Do not apply to vertical surfaces directly above pervious or impervious surfaces that drain into ditches, storm drains, gutters, or surface waters. • Do not apply or irrigate to the point of runoff. <p>However, this language appears to be limited to areas within 300m of specified ESA-listed species habitats.</p>	<p>and even if it is inclusive, it is not known how an unlicensed user would be able to determine if their location was within 300 meters of an ESA-listed habitat prior to using malathion.</p>
<p>Non-agricultural pesticide usage data. We share our analysis of California pesticide sales data, use data, and water quality monitoring data that suggests that most malathion in urban runoff likely stems from products sold at retail to non-professional users.</p>	<p>The report acknowledged CASQA's comment. (p.9) They reference CA DPR monitoring data, (p. 626 and p. 1344)</p>	<p>Partially</p>
<p>A BE is not a replacement for a Registration Review ecological risk assessment. An Ecological Risk Assessment is needed for malathion.</p>	<p>The document makes claims that they "followed an ecological risk assessment framework." (p.8)</p>	<p>No. The "framework" is not the same as an Ecological Risk Assessment.</p>
<p>The format of the public review documents was too complex, even for a nationwide BE.</p>	<p>No response.</p>	<p>No.</p>
<p>CASQA supports implementation of the Conservation Recommendations included in the FWS Biological Opinion, especially the following, which bear on issues relating to the presence and effects of malathion and other pesticides in the urban environment: 4. Work with other appropriate Federal, state, and local partners to study the efficacy of conservation practices in reducing pesticide loading to streams, lakes, wetlands, sinkholes, and other terrestrial and aquatic habitats from off-site transport.</p>	<p>It does not appear that they are going forward with any of these conservation measures. They cited other conservation measures, but did not reference these conservation measures (4-7) in the report.</p>	<p>No.</p>

<p>5. Develop methods and models that better describe and quantify pesticide persistence and fate and transport to assist in analyses for future pesticide consultations.</p> <p>6. Develop methods to better understand and quantify pesticide exposure from non-agricultural uses.</p> <p>7. Develop criteria that address when pesticide-contaminated sediment is an important route of exposure to aquatic or terrestrial organisms.</p> <p>[Biol. Op. pp. 519-520]</p>		
---	--	--

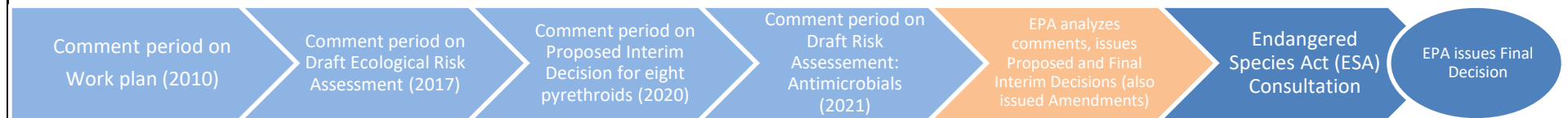
Pesticide: Oxadiazon – EPA–HQ–OPP–2014–0782
Why we care: Herbicide applied in outdoor urban settings.
Actions taken: CASQA sent a comment letter to EPA on the Proposed Interim Decision (PID) on October 4, 2021.
Status: EPA released the Interim Registration Review Decision (ID) in April 2022.



Next steps: EPA will issue an Interim Decision.
Recommendation: CASQA will continue to monitor this pesticide. No opportunity for comment at this time.

CASQA 10/4/2021 Comments to EPA (excerpt)	EPA Response	Did EPA incorporate CASQA's comment?
<p>CASQA Supports Proposed Mitigation for Oxadiazon. These uses include terminating most turf applications, prohibiting liquid applications, reducing amount of remaining applications, adding a non-target organism advisor notice, updating and standardizing the environmental hazard and groundwater/ surface water advisory statements</p>	<p><i>"EPA thanks CASQA for its comments on the oxadiazon PID. In response to new information and proposals received during the public comment period, EPA has made several changes to the proposed mitigation originally presented in the PID and encourages CASQA to review these changes. Details of these changes are provided in Section IV.A. These updates provide additional flexibilities to users linked to additional requirements (e.g., classification of oxadiazon as an RUP and instructions directing the user to thoroughly irrigate after application as soon as possible on the same day of application) while still adequately protecting drinking water sources. EPA has determined that the revised mitigations would substantially reduce potential for surface water runoff and impacts to non-target aquatic organisms while still adequately preventing unreasonable adverse risks to human health."</i> (Oxadiazon Interim Registration Review Decision, Case Number 2485, March 2022, pp.15-16)</p> <p><i>"There were five mitigations proposed in the PID that EPA has determined are no longer needed in the ID. EPA originally proposed terminating all turf uses except for golf course fairways and sod farms to address post-application risks of concern. Due to the new label language needed that instructs the user to water-in as soon as possible after application, the anticipated requirement for new TTR data with watering-in, and the revised mitigation on golf courses allowing treatment on up to 30% of all managed turf surfaces, EPA will not require these proposed terminations at this time. EPA originally proposed cancelling the end use product registered for tees and greens (EPA Reg. No. 9198-176) to address drinking water risks of concern. EPA has decided on a 30% golf course turf area restriction instead (Mitigation #7), which will allow continued use on tees and greens, and therefore allow EPA Reg. No. 9198-176 to remain registered."</i> (Ibid. pp. 44-48)</p>	<p>Partially. Although they went back on several of the mitigations that they had proposed, including allowing some uses on turf, they did keep some of the mitigations that are significant to the urban environment, including the proposed ban on liquid applications in the urban environment.</p>

Pesticide: Permethrin (EPA–HQ–OPP–2011–0039),
Use: Insecticides
Why we care: Priority pesticide due to toxicity, use, and monitoring data. 303(d) listings as well as adopted and pending TMDLs.
Actions taken: In February 2020, CASQA sent a comment letter to EPA on the Pyrethroids and Pyrethrins Ecological Risk Mitigation Proposal. In May 2020, EPA released a Proposed Interim Decisions for permethrin. In December 2021, CASQA sent a comment letter on the antimicrobials draft risk assessment for permethrin.
Status: EPA issued the 2nd Amendment to the Permethrin Interim Registration Decision on March 16, 2022.



Next steps: The Endangered Species Act Consultation is the next step in the process.
Recommendation: CASQA will continue to monitor the permethrin docket. There is no opportunity for comment at this time.

CASQA 12/28/2021 Comments to EPA	EPA Response	Did EPA incorporate CASQA’s comment?
<p>“We question the assumption that “exposure to aquatic areas from terrestrial uses is expected to be negligible”. Permethrin can be transported to surface waters from terrestrial wood preservative uses – specifically fences and decks...” The CASQA comment goes on to document transport over pervious and impervious surfaces. “Assuming similar leaching rates during rainfall events, and efficient transport of suspended permethrin in runoff through the storm drain system directly to a surface water body, the risk to aquatic species from permethrin-treated wood structures in impervious surface settings could be similar to the risks identified in the Draft RA for the dock/lake scenario.”</p>	<p>“As described in Section 3.3.1 Terrestrial and Aquatic Exposure Profile in the DRA, “given the low leaching rate (0.0125 %/day, MRID 49638201) from treated wood that is limited by the water solubility (0.0055 mg/L, 5.5 ug/L, Table 1) and the expected sorption to soil (MRID 41868001), exposure to terrestrial and aquatic organisms is expected to be negligible if treated wood is used in a terrestrial setting.” (2nd Amendment to Permethrin Interim Registration Review Decision, Case Number 2510, March 16, 2022. p. 4)</p>	<p>Partially. EPA acknowledges CASQA’s comment on leaching, but did not model the specific scenario, relying on estimates based on the water solubility and expected sorption instead.</p>

<p>“Modeling is Needed for Terrestrial Wood Preservative Uses. CASQA recommends that EPA use available PWC scenarios to model the terrestrial wood preservative uses of permethrin prior to publishing a final risk assessment or proposed interim decision.”</p>	<p>“Additionally, guidance in the 2020 American Wood Protection Association (AWPA) Book of Standards indicates that permethrin is not intended for use in aquatic environments such as docks or for ground contact such as fences.” (2nd Amendment to Permethrin Interim Registration Review Decision, Case Number 2510, March 16, 2022. p. 4)</p>	<p>Partially. Although the American Wood Protection Association’s Book of Standards indicates that permethrin is not intended to be used for these uses, the fact remains that there are labeled permethrin pesticides for these uses. It is unclear if the registrants intend to withdraw these label uses but no further changes were listed in this 2nd Amendment to the EPA’s Permethrin ID.</p>
<p>“Mitigation Is Needed. CASQA requests that EPA develop a program of mitigation to reduce the potential for negative impacts to aquatic organisms from the terrestrial wood preservative uses of permethrin.”</p>	<p>See above.</p>	<p>Partially. If the registrants pull products that are of concern. (see above)</p>

Pesticide: Pyrethrins – EPA–HQ–OPP–2011–0885
Use: Insecticide
Why we care: Related to pyrethroids, but less toxic and less stable
Actions taken: CASQA commented on the Ecological Risk Mitigation Proposal (February 2020).
Status: EPA released the Proposed Interim Registration Review Decision (PID) (August 2021).



Next steps: ESA Consultation is required but unlikely to begin before 2022.
Recommendation: Send comment letter to EPA supporting the proposed mitigations to pesticide label language.

CASQA Comments to EPA	EPA Response	Did EPA incorporate CASQA's comment?
<p>EPA's risk / benefit finding should be revised to differentiate among the 23 pyrethroids and pyrethrins and among the various outdoor urban uses of the 23 chemicals</p>	<p>“The pyrethroids have many uses across agricultural, residential, commercial, indoor and outdoor sites, and were grouped into broad categories to compare the potential exposure for those active ingredients that were not quantitatively assessed in the 2016 Ecological Risk Assessment.... For the purposes of risk-benefit analysis, and EPA considers this approach to provide adequate differentiation among uses assessed for the group of 23 chemicals. Among outdoor uses, EPA is aware of the potential for applications to impervious surfaces to contribute to waterway pollution. The Agency's mitigation for outdoor non-agricultural use as a category is reflective of those risk contributions. The Agency disagrees that a separate analysis of each pyrethroid or each specific use is needed to support EPA's risk assessment and risk management conclusions”</p> <p>“EPA's risk assessment supports the conclusions that there are risks of concern for aquatic organisms from exposure to pyrethroids, which is supported by water monitoring data that indicate that pyrethroids are present in the environment that result in adverse effects to aquatic invertebrates. The benefits from the use of these chemicals for these uses is also very high.”</p>	<p>No.</p>

EPA should ban outdoor urban use of Bifenthrin (separate pesticide from pyrethrins, but CASQA's comments were in response to a Risk Assessment that include both pyrethrins and pyrethroids).	"EPA... disagrees that a representative analysis featuring bifenthrin is necessary, as bifenthrin is not outstanding among pyrethroids in terms of RQ exceedances, aquatic invertebrate toxicity, or environmental persistence."	No.
Label change: CASQA supports prohibition on applications during rain	EPA incorporated suggested comment.	Yes.
Label change: CASQA supports advisory statement to avoid applications if rain is forecast within 24 hours	EPA incorporated suggested comment (although CASQA would prefer an enforceable statement via a word such as "prohibition").	Yes.
Label change: CASQA supports addition of water protection statements	EPA incorporated suggested comment.	Yes.
Label change: CASQA supports definition of spot treatment (2 sq. ft.)	EPA incorporated suggested comment.	Yes.
Label change: CASQA supports requirement that product labels explicitly state whether particular products are allowed to be used indoors only, outdoors only, or both indoors and outdoors	EPA incorporated suggested comment.	Yes.
Label change: CASQA supports reduction in height above ground level of building treatments from 3 feet to 2 feet	EPA incorporated suggested comment.	Yes.
Label change: CASQA requests that EPA identify a specific outdoor drain graphic and require the same graphic be used on all products.	"Regarding the suggestion...to add the down-the-drain advisory statements to all pyrethroids/pyrethrins labels (both agricultural and non-agricultural), outdoor and agricultural product labels already have label statements to prevent these chemicals from reaching drainage systems. In contrast, products with indoor uses do not currently have this language. Therefore, EPA has determined that these down-the-drain advisory statements are only necessary on products with indoor uses. However, registrants have the option to consider including this language (i.e., "unless for use in pipes and sinks") to agricultural product labels at their discretion." (Pyrethroids and Pyrethrins Revised Ecological Risk Mitigation and Response to Comments on the Ecological Risk Mitigation Proposal For 23 Chemicals, p. 7)	No.

<p>Label change: CASQA requests that EPA establish minimum size for the outdoor graphic, to ensure that it is legible, i.e., no smaller than 1.5 square centimeters unless this size is greater than 10% of the size of the label.</p>	<p>EPA incorporated CASQA's comment on graphic sizing for the <u>indoor</u> graphic, which helps fellow agencies such as BACWA.</p>	<p>Partially incorporated.</p>
<p>Label change: CASQA requests that EPA include Spanish translation for the outdoor drain discharge prohibition ("Do not allow the product to enter any drain during or after application."), and include this language on all outdoor non-agricultural products.</p>	<p>EPA incorporated suggested comment.</p>	<p>Yes.</p>

Pesticide: Ziram – EPA-HQ-OPP-2015-0568
Why we care: Fungicide/antimicrobial used in building products, including paint, caulks, and sealants. Highly toxic to aquatic life.
Actions taken: CASQA sent a comment letter to EPA on the Draft Ecological Risk Assessment (Draft RA) on January 19, 2021.
Status: EPA released the Proposed Interim Registration Review Decision (PID).



Next steps: EPA will issue an Interim Decision.
Recommendation: It is recommended that CASQA write a brief letter of support of the cancelation of Ziram in all paint products as well as additional controls placed on the non-paint uses (caulks, sealants) of Ziram.

CASQA 1/19/2021 Comments to EPA	EPA Response	Did EPA incorporate CASQA's comment?
<p>Based on EPA's analysis, there is risk to freshwater invertebrates (and fish) when fairly small amounts of ziram are applied in a given watershed...If even a small fraction of those buildings are painted with paint containing ziram in a given year, and if even a fraction of the ziram contained in that paint leaches to a surface water body, freshwater invertebrate (and fish) life could be impacted. Rather than speculating, EPA should modify its risk assessment analysis for freshwater invertebrates analytically, and with full documentation. This may require acquisition of additional data to perform an accurate assessment.</p>	<p><i>"The Agency thanks CASQA for their comment. The Agency agrees that additional data would allow for a more refined assessment of risks to aquatic invertebrates from the use of ziram in paint. However, because the Agency relied on a screening-level risk assessment using conservative assumptions, additional analyses are not likely to result in a higher risk than determined in the DRA. Therefore, the Agency maintains its conclusions of no expected risks to aquatic invertebrates from the ziram paint use."</i> (Registration Review Response to Comments on the Ziram DRA for Antimicrobial Uses, March 9, 2021, p.2)</p>	<p>Partially. EPA agrees that additional study would be useful, but ignores CASQA's comment about the impact of Ziram-containing paint in urban environments. However, due to human health effects, EPA is proposing cancellation of the paint preservative uses of ziram as well as additional controls for non-paint materials preservative uses of ziram.</p>

<p>The potential risk to sediment-dwelling aquatic invertebrates is incomplete, as the Draft EPA contains...confusing and contradictory language. CASQA therefore requests that the risk assessment be amended to include consideration of the results of a sediment toxicity study for freshwater invertebrates.</p>	<p><i>“As mentioned in Section 1.5 of the draft risk assessment, a chronic spiked-sediment study with thiram (using either an amphipod or chironomid) could help to determine if added risk may also come from exposure to contaminated sediment. EFED acknowledges that chronic toxicity data for sediment (benthic) invertebrates were not available at the time of the assessment because sediment toxicity studies were not requested in the respective problem formulations. Potential chronic risk to benthic invertebrates were evaluated using water-column invertebrate toxicity data as surrogates and potential chronic risk was identified. Some uncertainty is acknowledged as to whether benthic aquatic invertebrates may need further evaluation using sediment-based toxicity data given the complex fate characteristics of the chemicals. However, because potential chronic risk based on sediment pore water exposure and surrogate toxicity data was identified, EFED acknowledges that the data would help inform future risk assessments.”</i> (Thiram, Ferbam, and Ziram: EFED Response to Comments on the Draft Ecological Risk Assessment, March 24, 2021, p.18)</p>	<p>Partially. EPA acknowledges that CASQA is correct but is not requiring the registrant to provide the needed data. However, due to human health effects, EPA is proposing cancellation of the paint preservative uses of ziram as well as additional controls for non-paint materials preservative uses of ziram.</p>
---	---	---

Our Water Our World



Annual Summary Report

California Stormwater Quality Association

September 2022



Preface

The California Stormwater Quality Association (CASQA) is a nonprofit corporation that advances sustainable stormwater management protective of California water resources. With approximately 2,000 members, CASQA's membership is comprised of a diverse range of stormwater quality management organizations and individuals, including over 180 cities, 23 counties, special districts, federal agencies, state agencies, ports, universities and school districts, wastewater agencies, water suppliers, industries, and consulting firms throughout the state. Collectively, CASQA represents over 26 million people in California.

This report provides CASQA's members with focused information on its efforts to raise awareness about the connection between pesticide use and water quality through the Our Water, Our World program (OWOW). The goal of Our Water, Our World is to support a statewide integrated pest management IPM outreach program that provides direct to consumer information on less-toxic IPM practices.

By focusing on true source control and public outreach, OWOW advances two core components of [CASQA's Vision for Sustainable Stormwater Management](#)¹ (Principles 1 and 3).

Acknowledgements

Our Water, Our World is funded by CASQA, the organizations implementing the OWOW program (see Table 1 in Section 2 of this report) and is sponsored by the Bay Area Clean Water Association (BACWA). This report was prepared by Suzanne Bontempo, with support from Roshan Christoph (CASQA).

Disclaimer

Neither CASQA, Suzanne Bontempo, any contributors, nor the authors make any warranty, expressed or implied, nor assume any legal liability or responsibility for any third party's use of this report or the consequences of use of any information, product, or process described in this report. Mention of trade names or commercial products, organization, or suppliers does not constitute an actual or implied endorsement or recommendation for or against use, or warranty of products.

Copyright© 2022 California Stormwater Quality Association

All rights reserved. CASQA member organizations who have subscribed to Our Water, Our World may include this report in their annual reports, provided credit is provided to CASQA. Short sections of text, not to exceed three paragraphs, may be quoted without written permission provided that full attribution is given to the source.

¹ https://www.casqa.org/sites/default/files/downloads/final_-_vision_for_sustainable_stormwater_management_-_10-07-2020.pdf

Table of Contents

Preface	2
Acknowledgements	2
Disclaimer	2
Table of Contents	3
Section 1. Introduction	4
Section 2. OWOW Program Elements	4
2.1 Integrated Pest Management (IPM) Advocates.....	4
2.2 Educational Materials.....	4
2.3 Trade Shows.....	5
Section 3: OWOW Partnerships	5
Section 4. Annual Program Implementation (2021-2022)	10
4.1 IPM Advocates.....	10
4.2 Educational outreach material	10
4.3 Vendor Outreach.....	11
4.4 Training and Outreach for Retailers and Consumers	12
Section 5: OWOW Program Development	14
5.1 Updates in progress	14
5.2 Future Considerations	14
Appendix A – Images of OWOW Outreach Materials	1
Appendix B – Product Lists January 2022	1

Section 1. Introduction

Our Water, Our World (OWOW) is an award-winning partnership between city- and county-based water pollution prevention agencies and garden centers and hardware stores that sell pest control products. Initiated in 1998, the program focuses on less-toxic, eco-friendly products and techniques as many common pesticides are harmful to sensitive species and ecosystems when they reach local creeks, bays, and the ocean.

OWOW started as a pilot project in 1998, in just a handful of stores, initiated by the Contra Costa County Sanitation District, the City of Palo Alto Regional Water Quality Control Plant, and the Marin Countywide Stormwater Pollution Prevention Program. The program quickly grew and was administered by the former Bay Area Stormwater Management Agencies Association from 1999 – 2021. During that time, over 130 agencies in 16 counties implemented the program, working in approximately 239 stores. Starting in January 2022, the program was transferred to CASQA, with the goal of providing statewide access to this important and successful outreach program.

From a stormwater management perspective, OWOW is an excellent opportunity and cost-efficient way to educate the public and reduce toxicity in waterways from current use pesticides. Several municipalities utilize OWOW to meet permit requirements, including the San Francisco Bay Area Municipal Regional Permit², the Central Valley Region-wide MS4³, and the Phase II – Small MS4 General Permit⁴.

This report provides a summary of the OWOW program activities implemented between July 2021 and June 2022.

Section 2. OWOW Program Elements

The OWOW program consists of several elements, which are integral to its effectiveness.

2.1 INTEGRATED PEST MANAGEMENT (IPM) ADVOCATES

A critical component of the program, IPM Advocates are individuals who have been specifically trained on how to engage with retailers and the public. IPM Advocates provide in-store presentations and advice to customers about pest management methods that are healthier for people and the environment. IPM Advocates also provide training for store employees and on an annual basis, receive continuing education and training.

2.2 EDUCATIONAL MATERIALS

In the store, consumers are directed to less-toxic products and techniques through a variety of ways:

- Fact sheets are provided to educate the public on a wide range of pest management topics
- Shelf tags and display materials guide customers to less-toxic products
- Additional educational resources are provided, such as product lists and information about active ingredients in pest management products
- Many of the educational outreach materials provided in-store are being updated to include QR codes, linking directly to the [OWOW website](#).

² Municipal Regional NPDES Permit and Waste Discharge Requirements General Permit for Discharges from Municipal Separate Storm Sewer Systems (MS4), California Regional Water Quality Control Board – San Francisco Bay Region, 2009. Water Quality (WQ) Order R2-2009-0074-DWQ, NPDES NO. CAS612008, CA.

³ Municipal Regional NPDES Permit and Waste Discharge Requirements General Permit for Discharges from Municipal Separate Storm Sewer Systems (MS4), California Regional Water Quality Control Board – Central Valley, 2016. Water Quality (WQ) Order R5-2016-0040-DWQ, NPDES NO. CAS0085324, CA.

⁴ NPDES Permit for Waste Discharge Requirements for Discharges from Small MS4, California State Resources Control Board, 2013. WQ Order 2013-0001-DWQ, NPDES No. CAS000004, CA.

Online, via the OWOW website, consumers can view the following:

- All 18 fact sheets
- A list of stores participating in OWOW in their local communities
- A current list of eco-friendly and less-toxic products available in stores

2.3 TRADE SHOWS

OWOW representatives provide exhibits annually at trade shows to educate buyers on less-toxic products. Participation in these events is a critical step to ensure stores carry less-toxic products.

Section 3: OWOW Partnerships

The program is currently administered by CASQA, implemented by local cities and counties, with IPM Advocates and University of California Statewide IPM Program (UC IPM) serving as collaborative partners as shown in Figure 1.

CASQA manages and provides the central services necessary to operate and maintain Our Water, Our World, including the development of the in-store education materials (e.g., less-toxic product lists, label files, and active ingredient lists), creation and updates of outreach materials, operation and updates to the OWOW website, vendor (i.e., retail partners and pesticide distributors) outreach, preparation of an annual report, fulfillment of outreach materials orders, and program management and development.

IPM Advocates are highly trained individuals that support local implementation of the OWOW program in retail stores and are a crucial component of the OWOW program. They provide retail nurseries, hardware stores, and garden centers direct to consumer information on integrated pest management tools, products, and practices. They are the link between the municipalities and the retailers where they reach consumers. The IPM Advocates provide IPM trainings for store staff, and host webinars and events for customers via separate contracts with local agencies. Suzanne Bontempo was contracted by CASQA to coordinate the IPM Advocates to keep continuity within the program, hold regular meetings to communicate updates on new pests and new pest management techniques, and maintain the outreach material. The active IPM Advocates include: Suzanne Bontempo, Debi Tidd, Julie Barbour, Lorenzo Levinger, Charlotte Canner, Maris Sidenstacker, and Lisa Ratusz.

The UC IPM Program provides research and expertise on IPM practices promoted throughout the state and maintains a website of less-toxic integrated pest management practices for nearly 1000 home, garden, landscape, and turf pests. Karey Windbiel-Rojas, Staff Director for Urban and Community IPM, UC IPM Program has been involved with the IPM Advocate program since its inception and continues to assist with advocate training, technical resources on pest management practices, and as a liaison with UC resources.

Municipal agencies subscribe to OWOW through CASQA and implement the OWOW program in their local retail stores by contracting with IPM Advocates or using municipal staff or other contractors. Implementation may be implemented by a single agency at stores within their jurisdiction or organized at a regional scale, where Agencies combine resources to implement the OWOW program at select stores used by multiple jurisdictions. In addition, municipal agencies conduct outreach to educate residents about the OWOW program.

PROGRAMMATIC ROLES AND RESPONSIBILITIES

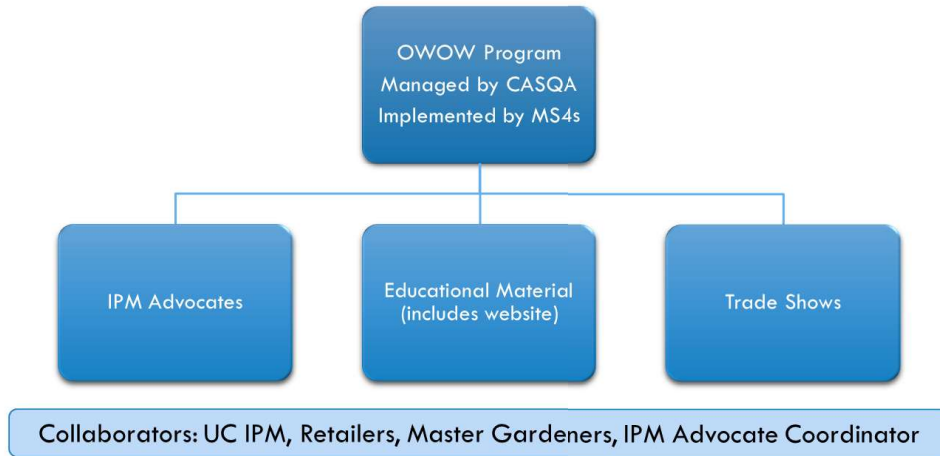


Figure 1. OWOW Program Roles and Responsibilities

Table 1 provides the list of agencies implementing OWOW as of June 30, 2022. Bay Area Clean Water Agencies (BACWA) continue to support the OWOW program as a sponsor.

Table 1 List of Agencies Implementing OWOW

Bay Area	
	City of Fremont
Alameda County	City of Half Moon Bay
Alameda County Flood Control & Water Conservation District	City of Hayward
Alameda County Public Works Agency	City of Healdsburg
City of Alameda	City of Hercules
City of Albany	City of Lafayette
City of American Canyon	City of Larkspur
City of Antioch	City of Livermore
City of Belmont	City of Los Altos
City of Belvedere	City of Martinez
City of Berkeley	City of Menlo Park
City of Brentwood	City of Mill Valley
City of Brisbane	City of Millbrae
City of Burlingame	City of Milpitas
City of Calistoga	City of Monte Sereno
City of Campbell	City of Mountain View
City of Clayton	City of Napa
City of Cloverdale	City of Newark
City of Concord	City of Novato
City of Cotati	City of Oakland
City of Cupertino	City of Oakley
City of Daly City	City of Orinda
City of Dublin	City of Pacifica
City of East Palo Alto	City of Palo Alto
City of El Cerrito	City of Piedmont
City of Emeryville	City of Pinole
City of Foster City	City of Pittsburg

Bay Area (Con't)

City of Pleasant Hill

City of Pleasanton

City of Redwood City

City of Richmond

City of Rohnert Park

City of San Bruno

City of San Carlos

City of San Jose

City of San Leandro

City of San Mateo

City of San Pablo

City of San Rafael

City of San Ramon

City of Santa Clara

City of Santa Rosa

City of Saratoga

City of Sausalito

City of Sebastopol

City of South San Francisco

City of St. Helena

City of Sunnyvale

City of Ukiah

City of Walnut Creek

Contra Costa Clean Water Program

Contra Costa County

County of Alameda

County of Marin

County of Napa

County of San Mateo

County of Santa Clara

Marin Countywide Stormwater Pollution Prevention Program

Mendocino County

Napa Countywide Stormwater Pollution Prevention Program

San Mateo Countywide Water Pollution Prevention Program

Santa Clara Valley Water District

Sonoma County

Sonoma County Water Agency

Town of Atherton

Town of Colma

Town of Corte Madera

Town of Danville

Town of Fairfax

Town of Hillsborough

Town of Los Altos Hills

Town of Portola Valley

Town of Ross

Town of San Anselmo

Town of Tiburon

Town of Windsor

Town of Woodside

Town of Yountville

Union City

Vallejo Flood and Wastewater District

Zone 7 Water Agency

Central Valley

Butte County

City of Ceres

City of Davis

City of Escalon

City of Lathrop

City of Lincoln

City of Lodi

City of Manteca

City of Newman

City of Patterson

City of Ripon

City of Riverbank

City of Roseville

City of Sacramento

City of Stockton

City of Tracy

City of Turlock

City of West Sacramento

City of Woodland

City of Yuba City

County of Sacramento

County of San Joaquin

El Dorado County

Fresno Metropolitan Flood Control District

Sacramento Stormwater Quality Partnership

Mountain House Community Service District

San Joaquin County

Stanislaus County

Yuba City

Central Coast

City Buellton

City of Carmel-by-the Sea

City of Carpinteria

City of Del Rey Oaks

City of Goleta

City of Monterey

City of Pacific Grove

City of Sand City

City of Santa Maria

City of Seaside

City of Solvang

County of Monterey

Santa Barbara County

Southern California

City of Santa Clarita

Sponsor

Bay Area Clean Water Agencies (BACWA)

Section 4. Annual Program Implementation (2021-2022)

The following OWOW outreach services were conducted between July 2021 and June 2022.

4.1 IPM ADVOCATES

After training by the University of California IPM Program, Advocates are contracted by local municipalities and then assigned to stores, where they pass on their knowledge to staff and hold educational events for customers. Excellent relationships between the Advocates and store management and staff are key to the successful promotion of less-toxic, eco-friendly projects. Current IPM Advocates were trained prior to COVID-19 pandemic. Between July 2021 and June 2022, no training for new or existing IPM advocates was conducted.

IPM Coordination

Ms. Bontempo held regular meetings to communicate updates on new pests and new pest management techniques with current IPM Advocates.

DPR Grant Application

In the spring of 2022, CASQA and collaborating partners initiated worked on a draft DPR grant application to fund the development of a IPM Advocate Training Program. The application was held hold until the program needs are further refined, and the best funding approach is identified. The future activities to develop a IPM Advocate Training Program are described in Section 5.

4.2 EDUCATIONAL OUTREACH MATERIAL

Educational material includes fact sheets for specific pests, gardening and pesticide applications, shelf labels to identify eco-friendly products in stores, and OWOW website that makes the material accessible to the public. Some examples of OWOW outreach materials are provided in Appendix A. New OWOW outreach materials were not printed in this reporting year as the local jurisdictions and IPM Advocates had sufficient materials in stock.

Fact Sheets

There are 18 OWOW fact sheets available, including four (4) available in both English and Spanish. During the COVID-19 pandemic, the need to transition from paper fact sheets to a digital option was identified. Trackable QR codes were created to digitally access the OWOW fact sheets in the pesticide aisle at each retailer. The trackable QR codes record which fact sheets are viewed by consumers in retail stores. The trackable QR code posters were developed in 2021 and made available in select stores starting January 2022. According to the data from the QR code posters, the top three fact sheets viewed between January and June 2022, were ants, rats and mice, and moles, voles, and gophers. Table 2 presents a summary of QR code scans per month for each fact sheet.

Website

The [OWOW website](#) provides public access to OWOW outreach material, IPM resources, and the Store Locator, an interactive map to search for participating stores. Updates to the [Store Locator](#) are made on a quarterly basis. The Store Locator was revised in June 2022 to add 11 new participating stores and remove 6 stores that are closed or no longer supporting the OWOW program.

Store-based Product Lists

The store-based product lists provide the current lists of the eco-friendly products that the Home Depot stores and Ace Hardware stores sell each year. IPM Advocates use the store-based product lists to identify the eco-friendly products on store shelves using labels or “shelf talkers/tags”. Each year, the lists are reviewed, and updates are made as needed in consultation with subject-matter-experts. This year, the new products had the same active ingredients as others and

therefore, no revisions were necessary. Each year, more pesticide companies label eco-friendly products responding to purchasing habits by the consumer. Appendix B provides the products lists from 2022.

**Table 2. Summary of QR Code Scans by OWOW Product:
January to July 2022**

OWOW Product	Total	Jan 2022	Feb 2022	March 2022	April 2022	May 2022	June 2022
OWOW Website	45	1	5	16	8	8	7
Ants	83	1	6	25	22	11	18
Aphids	62	0	3	19	16	11	13
Bed Bugs	29	0	3	4	9	5	8
Cockroaches	65	0	5	10	19	14	17
Fleas	40	0	3	4	14	10	9
Healthy Gardens	25	0	2	7	9	5	2
Hiring a Pest Co	15	0	2	4	5	3	1
Lawns	17	0	3	1	1	4	8
Moles Voles Gophers	92	0	6	25	25	14	22
Mosquitoes	51	0	9	8	13	11	10
Pesticide U&D	16	0	2	2	4	6	2
Pesticides & Water Quality	9	0	1	2	1	3	2
Rats & Mice	68	1	3	15	18	15	16
Roses	38	1	7	9	8	7	6
Snails & Slugs	36	0	2	9	15	4	6
Spiders	30	1	2	3	6	11	7
Weeds	21	1	2	6	6	3	3
Yellowjackets	30	1	2	8	9	7	3
Spanish Fact Sheets	23	1	2	9	2	5	4
Total	795	8	70	186	210	157	164

4.3 VENDOR OUTREACH

Education of vendors and retailers on less-toxic products is a critical step to ensure stores carry less-toxic products.

Retail Partners

Ms. Bontempo as the IPM Advocate Coordinator leads collaboration with key retail partners. During the past year, she maintained a relationship with the Home Depot Corporate Sustainability Officer. She communicates quarterly to keep goals aligned and to provide Home Depot with updates on OWOW activities in the stores. Each year, OWOW receives a letter of support from the Home Depot Corporate Sustainability Officer that facilitates collaboration with local retailers. Home Depot Corporate is a model retailer partner and OWOW strives to replicate this partnership with other retailers and vendors. Ms. Bontempo plans to initiate communications with new contacts at Lowe's. She has also met with the CNRG Ace Hardware group with the goal of expanding the OWOW program into more of their stores. hardware group in hopes to expand the OWOW program throughout their stores.

Vendor Communication

OWOW has established relationships with national pesticide manufacturers. Annual communication with vendors is essential to learn about new pesticide active ingredients, products, and market trends. Key vendors have reported many obstacles in 2022 as follows:

- Supply chains are still straining product supply
- In-store sales have returned from the pandemic
- During a drought, consumers tend to purchase less live plant material.
- Consumer expendable cash flow is less available due to inflation and fuel cost

Trade Show Booths

Attending trade shows provides an opportunity to meet the vendors, learn about the new products coming onto the marketplace in California, answer questions, and provide mentorship to the retail buyers. In 2022, OWOW representatives planned to attend trade shows, however, the in-person events were suspended due to COVID-19. Below is the list of trade shows that OWOW representatives typically attend each year.

- Central Lawn & Garden Distributor Trade Show, Las Vegas NV
- L&L Nursery Distributor Trade Show, Reno, NV: OWOW representatives joining the L&L Distributors virtual trade show.
- NorCal Landscape Trade Show, San Mateo, CA

4.4 TRAINING AND OUTREACH FOR RETAILERS AND CONSUMERS

IPM Advocates and other OWOW service providers conduct OWOW outreach activities to educate retailers and consumers at the local level. Local OWOW Implementation activities vary between agencies. Agencies receive tailored OWOW reports from their contracted IPM Advocate with a summary of their local OWOW data (for example, the number of trainings, the number of staff trained, and/or the number of fact sheet distributed).

IPM Advocates provided OWOW services to approximately 243 participating retailers throughout California. This reporting year, 9 retailers were added in the Sacramento area, Marin County, Alameda County, Sonoma County, and Contra Costa County. Table 3 provides a summary of outreach activities between July 2021 and June 2022. These activities were funded by local municipalities and stormwater programs.

Table 3 Summary of Outreach Activities

Audience	OWOW Outreach Activity
Retailers	243 retailers participating in the OWOW program
	115 trainings were conducted
	768 retail staff were trained
Direct to Consumer	99 OWOW public outreach events
	8781 people attended OWOW public outreach events (In person and virtually)
	795 scans of QR Codes for OWOW fact sheets

Note: QR Code tracking began January 1, 2022

IPM Advocates conducted 115 trainings and trained 768 retail store staff. Main topics include IPM, managing pest problems with a less-toxic approach. In addition, IPM Advocates provided tips for new gardeners and how to protect gardens in the time of drought. Education has expanded to include protecting gardens during times of drought since plants are more prone to pest problems when they are (drought) stressed. IPM Advocates provided more digital support including a monthly retailer e-newsletter, online webinars and social media posts to the public. These activities are described in more detail below.

Impacts due to COVID-19 Pandemic:

- Retailers were still impacted by the supply chain challenges and inventory shortages.
- Retailers were also challenged by labor shortages, frequent new hires, and key staff out due to coronavirus related exposure or illness.
- Scheduling staff trainings for the retailer partners was challenging due to labor shortages and staff calling out due to coronavirus exposure. This caused IPM Advocates to reschedule several trainings, and/or work with the few staff present on the day.
- When in-person, IPM Advocates worked with store staff in smaller groups of multiple training sessions back-to-back.

OWOW Retailer e-Newsletter:

- Currently, of the total 243 retailers, there are 161 retailers receiving the e-newsletters.
- A monthly newsletter is emailed to participating retailers at the beginning of each month. This newsletter contains information on seasonal pest problems and eco-management solutions and assists with ensuring that all key store staff, including managers, are receiving the information. Many of the managers print the OWOW newsletter and post it for all staff to review. The newsletter lists the upcoming events that IPM Advocates are participating in, such as in-person tabling events or on-line webinars. Retailers have then posted the relevant events into their newsletters that are sent out to their customers. The newsletter also includes information on upcoming professional trainings, such as the Qualified Water Efficient Landscape (QWEL) trainings.

OWOW IPM Educational Webinars:

- Webinars were developed in lieu of in-person outreach events during the first year of the COVID-19 pandemic. These webinars have grown in popularity and now are a regular service provided by IPM Advocates to agencies that contract with them at the local scale. Each registrant received a program outline and a 'Helpful Gardening Resource' page.

OWOW IPM Social Media Posts/Tips:

- OWOW IPM tips were created for social media content as an additional way to expand the OWOW message to the public. IPM Advocates create seasonal content as a guide to prevent and manage each pest. This public outreach option is available at the local scale to those agencies contracted with an IPM Advocate. Agencies retain data of views and responses to each post.

Twelve bilingual IPM tips were provided throughout the contract year:

- Rodent exclusion
- Fall for planting
- Hiring a Pest Control Company
- Organic Fertilizers
- Rose Care
- Composting
- Yellow jacket prevention
- Installing a rain garden
- Dormant sprays
- Weed management
- Mosquitos
- Powdery mildew

Section 5: OWOW Program Development

To support a growing demand for OWOW outreach material and IPM Advocates, there are efforts currently underway, as well as future considerations, that are necessary to advance the OWOW program and its services.

5.1 UPDATES IN PROGRESS

Review of OWOW Outreach Materials

CASQA is establishing a review process for OWOW materials. In 2023, it is anticipated that OWOW outreach materials will be reviewed for technical accuracy and updated by subject matter experts. Retailer e-newsletters will be reviewed by subject matter experts prior to release starting July 2022. OWOW will also be coordinated with CASQA's larger pesticide regulatory work (CASQA, 2022)⁵.

New Order Process for OWOW Outreach Materials

The process for ordering OWOW outreach material was modified to conduct bulk ordering twice per year (starting August 2022). Ordering in bulk provides the best price for all materials. CASQA developed a new online order form to compile the bulk order.

5.2 FUTURE CONSIDERATIONS

Annual Reporting

In 2023, CASQA will develop a new process, schedule and supporting templates and tools, as needed, for OWOW Subscribers to report on OWOW implementation activities. This information can then be integrated into the Annual Report to provide a more robust perspective of local implementation activities throughout the state.

IPM Advocate Training Program

To operate at a statewide scale, and in a sustainable manner, certain aspects of the existing OWOW program must be formalized and expanded. In 2022, CASQA began developing an outline for a potential Qualified IPM Advocate Training Program. CASQA will coordinate workgroups comprised of OWOW Subscribers, current IPM Advocates, and training experts to develop a framework for the Qualified IPM Advocate Training Program. This framework will be utilized to seek outside funding (e.g., a future grant application or partnership with another organization).

IPM Advocate “In-Training”

While IPM Advocate training opportunities are not available, Suzanne Bontempo, as the IPM Advocate Coordinator will provide support for individuals interested in becoming IPM Advocates. The IPM Advocate “In-training” program will ensure that individuals providing OWOW outreach services in stores are providing the latest information and are consistent with the program. The IPM Advocate “In-training” program will be initiated in Fall of 2022 and provide a bridge for additional IPM Advocate services until the Qualified IPM Advocate program can be developed and implemented.

⁵ See report from 2022. the Pesticide Annual Report and Effectiveness Assessment. California Stormwater Quality Association. Sacramento, CA. This document is available in the CASQA [Member Library](#).



Appendix A – Images of OWOW Outreach Materials



Figure A.1 Trackable QR Code Poster in Store Aisle

EFFECTIVE ECO-FRIENDLY PEST CONTROL • LESS-TOXIC PRODUCTS



CONTROLLING ANTS

IN YOUR HOME

CONTROL ANTS IN YOUR HOME WITH THESE ECO-FRIENDLY PRODUCTS

Bait stations containing borates or hydramethylnon	Amdro Kills Ants Ant Killer, Amdro Kills Ants Ant Killing Bait, Combat Source Kill 4 products, KM Ant Pro products, Maggie's Farm Simply Effective No Spill Ant Kill, Terro Ant Killer II Liquid Ant Baits
Diatomaceous earth (DE) products	Concern Diatomaceous Earth Crawling Insect Killer, Safer Brand Diatomaceous Earth Ant and Crawling Insect Killer, St. Gabriel Organics Insect Dust—Diatomaceous Earth
Applicator for diatomaceous earth (DE)	Pest Pistol
Plant-based insecticides	EcoLogic Ant and Roach Killer, Ecosmart Ant and Roach Killer, Orange Guard
Hose attachment	Bug Blaster
Sticky barrier	Stikem Special pest glue, Tree Tanglefoot Insect Barrier

Argentine ants are frequent invaders in California homes. They are tiny (1/8 inch). They come inside a few at a time at first (the scouts), and then in long lines, following scent trails to a food source.

A QUICK FIX FOR AN ANT EMERGENCY

If you deal with ants when they first come inside, a few simple steps can take care of the problem.

1. Find what ants are after (usually leftover food) and where they are entering the room (usually through a crack in the wall). Mark the spot so you can find it again. If you can't find an entry point, see Step 4.
2. Spray lines of ants with soapy water and wipe up with a sponge, and clean up any food or spills.
3. Next, block entry points temporarily with a smear of petroleum jelly or a piece of tape.
4. If you can't find an entry point, clean up the ants (Step 2). Place a bait station in an out-of-the-way spot on the line the ants have been following. Remember to remove the bait station when the line of ants has disappeared so you don't attract more ants into the house. (See *Tips for Using Ant Baits*.)

While they can be pests, ants are helpful creatures, especially outside. Ants kill and eat many pest insects, help to aerate soil, and recycle animal and vegetable material. This is good news, because it's probably not possible to eliminate ants from their outdoor habitat. The best way to manage an ant invasion is to keep them outside.

KEEP ANTS AWAY

- Store food in the refrigerator, or in containers that seal tightly.
- Keep things clean and dry, and fix leaking faucets and pipes (ants come in to find water as well as food).
- Weather-strip doors and windows.





Choose eco-friendly products for your home and garden. Look for this symbol before you buy.

Figure A.2 Ant Fact Sheet

OWOW Retail Newsletter July 2022 edition

July: Powdery Mildew, rodent exclusion, shade cloth and anti-transpirant

June: Mosquitos, Yellow jackets & Flies or Cucumber beetles

Powdery Mildew

As the summer temperatures warm up & dry out, powdery mildew seems to come on strong. This fungus is most noticed it on the leaves of crape myrtles, summer squash, roses, tomatoes and so many more.

Powdery mildew is a common fungal disease found on many different types of plants. It appears as a white or grayish, powdery growth that is most commonly found on leaf surfaces, but may also infect buds, shoots and even flowers and fruits. This ‘powder’ is actually the mycelium and spores of the fungi. Powdery mildew is rarely fatal, however on some plants, leaves may yellow and fall off, and leaves and shoots may distort.

There are many different types of powdery mildew fungi that can cause the disease, and spores can be spread to new plants by wind. But all of the spores need leaves free of water to germinate, so water on the plant surfaces can actually inhibit germination and kill the spores. Ideal conditions for powdery mildew are temperatures between 60° and 80° F, but it can be active in temperatures from 55° and 90° F. It is most common in shady conditions and dense plantings.

PREVENTION

The best way to manage powdery mildew is to prevent it through cultural practices.

- Place plants in full sun where possible, and provide good air circulation
- Avoid excess fertilizer that stimulates new growth that is more prone to the fungus. Use compost and organic fertilizers to prevent excessive tender, overgrown foliage that shades the leaves and provides the right conditions for the fungus.
- Prune out small infestations, but don’t over-prune to avoid rapid growth.
- Irrigate plants by watering leaves mid-morning to kill the spores, and to allow leaves to dry quickly to avoid other fungal infections.
- Clean up dead plant material and fallen leaves so that spores don’t spread and won’t be able to overwinter in plant tissue.
- Choose plant varieties that are resistant to powdery mildew when possible.

USING FUNGICIDES

In case of severe infections, there are several environmentally friendly products that can help to manage powdery mildew. Most of these products are best used to prevent powdery mildew, so apply them to plants susceptible to the disease before you see the powdery mildew or in the very beginning stages. Thoroughly cover all plant parts, including under the leaves. Additional applications may be needed as the plant grows.

Figure A.3 July e-Newsletter Page 1



Appendix B – Product Lists January 2022

The Home Depot product list 2022:

Pesticide Bays

Amdro Gopher Traps
BioAdvance House Plant Insect & Mite Control
Bird-B-Gone Stainless Steel Bird Spikes
Black Flag Pantry Pest Trap
Black Flag Roach Motel
Bonid Captain Jack's Lawnweed Brew
Bonide Copper Fungicide
Bonide Cpt Jack's Dead Bug Brew
Bonide Cpt Jack's Dead Weed Brew
Bonide Cpt Jack's Neem Max 70%
Bonide Insecticidal Super Soap
Bonide Mole Max
Bonide Neem Oil
Bonide Orchard Spray
Bonide Repels All
Bonide Rose Rx
Bonide Tomato & Vegetable
Buggy Beds Bed Bug Trap
Critter Ridder
Cutter Essentials Bug Control
Cutter Essentials Outdoor Fogger
Dr. Earth Pest Control Insect Killer
EcoLogic Ant & Roach Killer
EcoLogic Bed Bug Killer
EcoLogic Home Insect Control
Fly Swatter
Garden Safe Fungicide 3
Garden Safe Houseplant & garden
Garden Safe Insecticidal Soap
Garden Safe multi Garden Insect
Garden Safe Neem Oil
Garden Safe Rose & Flower
Garden Safe Slug & Snail
Gopher Traps
Green Gobbler 20% Vinegar Weed Killer
Harris Roach Tablets
Havahart Live Animal Trap
Hot Shot Bed Bug Killer Dust
Hot Shot MaxAttrax Roach Killing Powder
Liquid Fence Deer & Rabbit Repellent
Monterey B.t.
Mosquito Dunks
Mouse Traps
Mouse X
Ortho Bed Bug Trap
Ortho Ground Clear Weed & Grass Killer (green label)
Owl, Garden Defense
Raid Ant Baits III
Raid Fly Ribbon
Raid Fly Stick
Raid Fly Trap
Raid Window Fly Trap
Rat Traps
Rat X
Rescue Fly Trap
Rescue Fly Trap Refill
Rescue Outdoor Fly Trap
Rescue W-H-Y Trap
Rescue W-H-Y Trap Refills
Rescue Wasp Trap Stik
Rescue Yellow Jacket Trap
Rescue Yellow Jacket Trap Cartridge
Rescue Yellow Jacket Trap Refill
Sevin 2-in-1 Sulphur Dust
Safer Brand Ant, Roach & Spider Killer
Safer Brand Diatomaceous Earth Crawling Insect Killer
Safer Brand Home Pest Control
Safer Brand Indoor Fly Trap
Safer Brand Indoor Fly Trap Refills
Safer Brand Snake Shield
Skunk Scram Repellent Granulars
Southern Ag Thuricide Bt
Terro Flea Trap
Terro Fruit Fly Trap

Terro Indoor Fly trap
Terro Liquid Ant Bait
Terro Multi-Surface Liquid Ant Baits
Terro Outdoor Liquid Ant Bait Stakes
Tom Cat Attractant Gel
Tom Cat Mouse Trap
Tom Cat Rat Traps
Tom Cat Rodent Repellent
Treekote Aerosol Tree Wound
Uncle Ian's Dog & Cat Repellent
Uncle Ian's Mole, Gopher, Deer, & Squirrel Repellent
Victor Electric Mouse Trap
Victor Electric Rat Trap

Fertilizer Bays

Alaska Fish Fertilizer
Dr Earth Lawn Food
Dr. Earth Fertilizer
Earthworm Castings
Espoma Fertilizer
Espoma Organic Lime
Espoma Organic Soil Acidifier
First Saturday Lime Insect Repellent
Kellogg Organic Plus Fertilizer
Kellogg Organic Plus Lawn Fertilizer
Kellogg Organic Plus Fish & Kelp Fertilizer
Mater Magic
Miracle-Gro Fertilizer Spikes
Miracle-Gro Fertilizer Spikes Tree & Shrub
Miracle-Gro Performance Organics
Monterey Fish & Guano Fertilizer
Osmocote
Pennington Epsom Salts
True Organic Fertilizer
True Organic Blood Meal
True Organic Bone Meal
Vigoro Fertilizer Spikes
Vigoro Tree & Shrub Fertilizer Spikes
Vigoro Fruit, Nut & Citrus Fertilizer Spikes

Victor Gopher Traps
Victor Mouse Traps
Victor Rat Traps
Victor Rat-A-Way Rat & Mouse Repellent
Victor Rodent Repeller Packs
Weed Block Landscaping Fabric
Weed Control Fabric
Zevo Ant, Roach & Spider
Zevo Fly, Gnat & Fruit Fly
Zevo Flying Insect Trap
Zevo Multi Insect
Zevo Wasp, Hornet, & Yellow Jacket

The ACE Hardware product list 2022:

Alaska Fish Fertilizer
Amdro Kills Ants Ant Killer
Answer Kills Roaches Powder
Bed Bug Traps
BioCare Codling Moth Traps
Bird Repellent Gel
Bird Scare Tape
Bird-B-Gone Flash Tape
Bird-B-Gone Steel Bird Spikes
Black Flag Roach Motel
Black Flag Window Fly Traps
Bonide All Seasons Spray Oil
Bonide Burnout
Bonide Captain Jack's Dead Bug Brew
Bonide Chipmunk, Squirrel, & Rodent Repellent
Bonide Copper Fungicide
Bonide Go Away! Rabbit, Dog, & Cat Repellent
Bonide Hot Pepper Wax Animal Repellent
Bonide Insecticidal Soap
Bonide Mole Max
Bonide Mosquito Beater
Bonide Mouse Magic
Bonide Neem Oil
Bonide Rat Magic
Bonide Repels All
Bonide Snake Stopper
Bonide Sulfur Fungicide
Bonide Tomato & Vegetable
Bonide Wilt Stop
Buggy Beds
Cloud Cover
Combat Ant Killing Bait
Combat Roach Killing Bait
Critter Ridder Sprinkler
Good Nature CO2 Rodent Trap
Gopher Baskets
Gopher Hawk
Gopher Scram
Gopher Traps
Harris 20% Vinegar Weed Killer
Harris Bed Bug Killer Diatomaceous Earth
Harris Boric Acid Roach Powder
De-Fence Deer & Rabbit Repellent
Deer Off Deer Repellent
Diatomaceous Earth
Dr. Earth Final Stop Disease Control Fungicide
Dr. Earth Final Stop Fruit Tree Insect Killer
Dr. Earth Final Stop Rose & Flower Insect Killer
Dr. Earth Final Stop Vegetable Insect Killer
Dr. Earth Final Stop Yard & Garden Insect Killer
Dr. Earth Organic Fertilizer
Drop in the Bucket Mouse Trap
E.B. Stone Organic Fertilizer
Earth's Ally Disease Control
Earth's Ally Insect Control
Earth's Ally Weed & Grass Killer
Earth's Ally Weed Killer
EcoSmart 3 in 1 Rose & Flower
EcoSmart Ant & Roach Killer
EcoSmart Flying Insect Killer
EcoSmart Garden Insect Killer
EcoSmart Home Pest Control
EcoSmart Insect Killer
EcoSmart Insect Killing Granules
EcoSmart Mosquito Fogger
EcoSmart Wasp & Hornet Killer
EcoSmart Weed & Grass Killer
Epsom Salts
Espoma Garden Lime
Espoma Organic Fertilizer
Espoma Organic Insect Soap
Espoma Soil Acidifier
Fly Paper
Fly Ribbon
Fly Stick
Fly Swatter
Fly Trap
Fresh Cab Rodent Repellent
Fruit Fly Trap
Giant Destroyer Garlic Repellent Clips Deer & Rabbit
Harris Diatomaceous Earth
Harris Famous Roach Tablets
Harris Neem Oil
Harris Roach Traps
Havahart Live Animal Cage Trap
Insect Sticky Traps
Jobe's Fertilizer Spikes
Jobe's Organic Fertilizer

Jobe's Organic Fertilizer Spikes
JT Eaton Kills Bed Bugs Powder
Liquid Fence Animal Repellent
Liquid Fence Deer & Rabbit
Liquid Fence Snake Repellent
Live Catch Mouse Trap
Messina's Animal Stopper
Messina's Deer Stopper
Messina's Rodent Stopper
Messina's Squirrel Stopper
Miracle Gro Performance Organics
Mole Trap
Mole X
Monterey 70% Neem Oil
Monterey Bt
Monterey Fish & Guano
Monterey Fruit Tree Spray Plus
Monterey Garden Insect Spray
Monterey Horticultural Oil
Monterey Liqui-Cop
Monterey Neem Oil
Monterey Take Down Garden Spray
Mosquito Bits
Mosquito Dunks
Moss Out! Roofs & Walks
Mouse Traps
Mouse X
Mouse Zero
Natria Grass & Weed Control
Natria Insect, Disease, & Mite Control
Natria Insecticidal Soap
Natria Neem Oil
Natria Rose & Flower
Natria Snail & Slug Killer Bait
Nature's Care Organic Fertilizer
Neem Oil
Orange Guard
Organocide Bee Safe 3 in 1 Garden Spray
Ortho 3 in 1 Insect, Mite, & Disease
Ortho Bed Bug Traps
Ortho Deer B Gon
Ortho GroundClear Weed & Grass
Ortho Home Defense Ant & Roach Killer w/ Essential Oils
Ortho Home Defense Crawling Bug Killer w/ Essential Oils
Ortho Home Defense Flying Bug Killer w/ Essential Oils
Ortho Insect Killer Tree & Shrub
Osmocote
Owl Garden Defense
Pulverize Weed & Grass Killer
Pulverize Weed Killer for Lawns
Pulverize Weed, Brush & Vine Killer
Raid Ant Baits III
Raid Essentials Ant & Roach
Raid Essentials Ant, Spider, & Roach
Raid Small Roach Baits
Rat Traps
Rat X
Rat Zero
Rescue Ant Baits
Rescue Fly Trap
Rescue Fly Trap Refill
Rescue Fly TrapStik
Rescue Pantry & Birdseed Moth Traps
Rescue WHY Trap
Rescue WHY Trap Refills
Rescue Yellowjacket Trap
Rescue Yellowjacket Trap Cartridge
Rescue Yellowjacket Trap Refill
Safer 3 in 1
Safer Ant & Crawling Insect Killer
Safer Caterpillar Killer
Safer Critter Ridder Animal Repellent
Safer Critter Ridder Deer & Rabbit
Safer Diatomaceous Earth
Safer End ALL
Safer Garden Dust
Safer Garden Fungicide
Safer Houseplant Sticky Stakes
Safer Insect Killing Soap
Safer Moss & Algae Killer
Safer Neem Oil
Safer Pantry Pest Trap
Safer Rose & Flower
Safer Snake Shield
Safer Tomato & Vegetable
Safer Yellowjacket & Wasp Attractant
Safer Yellowjacket & Wasp Trap
Scarecrow
Scott's Continuous Release Fertilizer
Scotts Moss EX
Scram for Cats
Sevin Sulfur Dust
Shake Away Rodent Repellent
Slug Trap
Sluggo
Sluggo Plus
Soil Moist
St. Gabriel Moss Killer

Stay Away Ants
Stay Away Mice
Stay Away Moths
Stay Away Spider
Tanglefoot
Terro Ant Killer Liquid
Terro Clothes Moth Alert
Terro Flea Trap
Terro Fly Magnet
Terro Fruit Fly Trap
Terro Indoor Fly Trap
Terro Liquid Ant Bait
Terro Moth Traps
Terro Multi-Purpose Insect Bait
Terro Multi-Surface Liquid Ant Bait
Terro Outdoor Liquid Ant Bait
Terro Roach Magnet
Terro Wasp & Fly Trap
Tom Cat Animal Repellent
Tom Cat Attractant Gel
Tom Cat Deer Repellent
Tom Cat Mouse Traps
Tom Cat Rat Traps
Tom Cat Rodent Repellent
Victor Black Box Gopher Trap
Victor Electronic Mouse Trap
Victor Electronic Rat Trap
Victor Fly Magnet
Victor Mole & Gopher Repellent
Victor Mole Trap
Victor Mouse Traps
Victor Mouse-A-Way Mouse Repellent
Victor Natural Rodent Repeller Packs
Victor Rat Traps
Victor Rat Zapper
Victor Rat-A-Way Rat & Mouse Repellent
Victor Tin Cat Mouse Trap
Whitney Farms Lawn Weed Killer
Whitney Farms Organic Fertilizer
Whitney Farms Weed & Grass Control
Window Fly Trap
Yard Enforcer Sprinkler