Santa Clara Valley
Urban Runoff
Pollution Prevention Program

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

Hand Delivered on September 15, 2010

September 15, 2010

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

Subject: Submittal of FY 2009-2010 Program Annual Report

Dear Mr. Wolfe:

I am pleased to submit the Santa Clara Valley Urban Runoff Pollution Prevention Program's *FY 09-10 Annual Report* documenting Program-wide activities conducted during FY 2009-2010. The Program's *FY 09-10 Annual Report* consists of 15 sections and an Appendix. Each section reports on Program activities and the Program's involvement in regional activities associated with a specific Permit Provision. Related tasks and activities not related to a specific Permit Provision (e.g., street sweeping, Santa Clara Basin Watershed Management Initiative (SCBWMI) activities, etc.) are placed in the most appropriate section. Section 15 contains the *Regional Supplement for Pollutants of Concern and Monitoring* developed by BASMAA member agencies. Please note that much of the information in Section 15 is a work-in-progress and is being submitted to illustrate the progress being made on numerous region-wide permit provisions.

Pursuant to Provision C.16.c., the Program's *FY 09-10 Annual Report* includes a certification statement signed by the Program Manager. The Program's Management Committee, at its September 2, 2010 meeting, authorized the Program Manager to submit the *FY 09-10 Annual Report* on its behalf.

This submittal was also provided electronically to the Water Board in accordance with the directions provided by Water Board staff in the document entitled *Guide for Submitting Electronic Documents*.

Please contact me if you have any comments or questions. We look forward to working with you to successfully address new challenges during FY 10-11.

Very truly yours,

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

111 West Evelyn Avenue, Suite 110 • Sunnyvale, CA 94086 • tel: (408) 720-8811 • fax: (408) 720-8812
1410 Jackson Street • Oakland, CA 94612 • tel: (510) 832-2852 • fax: (510) 832-2856
1-800-794-2482

CC: SCVURPPP Management Committee Members

Attachments: FY 2009-2010 Annual Report- Sections 1-15- one (1) hard copy
FY 2009-2010 Annual Report- Appendices- one (1) hard copy
FY 2009-2010 Annual Report- Sections 1-15 and Appendices- one (1) compact disc

** The Program's *FY 09-10 Annual Report* is also provided at www.scvurppp.org.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

September 15, 2010

FY 2009-2010 Annual Report

Submitted in Compliance with NPDES Permit No. CAS612008 (Order R2-2009-0074)

Program Annual Report
Sections 1 - 15

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

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Certification Regarding SCVURPPP Program Annual Report

"I certify, under penalty of law, that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to ensure that qualified personnel properly gather and evaluate the information submitted.[1] Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted, is, to the best of my knowledge and belief, true, accurate, and complete.[2] I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.[3]"

Submitted on behalf of the Santa Clara Valley Urban Runoff Pollution Prevention Program (per Management Committee Direction)

September 15, 2010

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

[1] Notwithstanding the above, certain attachments were prepared as regional submissions as part of BASMAA collaborative efforts on behalf of all MRP Co-permittees.

[2] Notwithstanding the above, some of the attachments are works-in-progress and are submitted only with the intent and for the purpose of illustrating progress.

[3] Even though the Program report contains and incorporates the individual Co-permittee annual reports as attachments, this certification is made only with respect to the former; separate Co-permittee certifications have been provided with the latter.

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CREDITS

This Annual Report was a collaborative effort of the fifteen agencies participating in the Santa Clara Valley Urban Runoff Pollution Prevention Program (Program). EOA, Inc., as the Program management consultant, coordinated and compiled the Annual Reports submitted by the fifteen Co-permittees; and was responsible for the overall preparation of the Program's Annual Report. The Program expresses its appreciation to all those who contributed to this twentieth Annual Report.

Management Committee Voting Members

- Cupertino -- Cheri Donnelly
- Los Altos – Larry Lind
- Los Altos Hills – Richard Chiu
- Milpitas – Kathleen Phalen
- Mountain View -- Eric Anderson
- Palo Alto -- Joe Teresi
- San Jose – Melody Tovar, MC Vice Chair
- Santa Clara – Dave Staub
- Sunnyvale – Lorrie Gervin, Budget AHTG/Executive Committee Chair
- Santa Clara County – Clara Spaulding
- Santa Clara Valley Water District – Ann Draper, MC Chair
- West Valley Communities – Kelly Carroll
  - Campbell
  - Los Gatos
  - Monte Sereno
  - Saratoga

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Section 1

Introduction

September 15, 2010

Section 1 Introduction

Background

Program Description

The Santa Clara Valley Urban Runoff Pollution Prevention Program ("Program") is an association of thirteen cities and towns in Santa Clara Valley, the County of Santa Clara, and the Santa Clara Valley Water District ("Co-permittees") that share a common permit to discharge stormwater to South San Francisco Bay. The Program incorporates regulatory, monitoring and outreach measures aimed at reducing pollution in urban runoff to the "maximum extent practicable" to improve the water quality of South San Francisco Bay and the streams of Santa Clara Valley. The Program is organized, coordinated, and implemented in accordance with a Memorandum of Agreement (MOA) signed by the Co-permittees in 1990, 1999, 2005 and 2006. The MOA covers the responsibilities of each Co-permittee and a cost-sharing formula for joint expenditures.

In June 1990, the San Francisco Bay Regional Water Quality Control Board (Water Board or RWQCB) issued the Program its first NPDES permit.[1] The permit was reissued in 1995[2], 2001[3] (amended in 2001[4] and 2005[5]) and 2009[6]. The permit reissued in 2009 is referred to as the Municipal Regional Stormwater NPDES Permit (MRP). The MRP covers stormwater discharges from a total of 76 municipalities and local agencies in Alameda, Contra Costa, San Mateo, and Santa Clara Counties, and the cities of Fairfield, Suisun City, and Vallejo.

Program Management

At the inception of the Program, the Santa Clara Valley Water District took the lead responsibility for management of the Program. EOA, Inc. was later retained to provide Program management services, and the Program's Management Committee designated the District as the Program's fiscal agent. On July 1, 2005, the City of Sunnyvale became the Program's fiscal agent.

The Program's Management Committee (MC) is the official decision-making body for the Program. The MC consists of at least one person from each Co-permittee who is officially designated and duly authorized to vote in his/her capacity as representative to the Program. In most instances, Co-permittees have also designated and authorized alternative representatives to vote in the absence of the primary representative. In all cases, the person authorizing and designating the representative to the Program is a duly authorized representative of the principal executive officer or ranking official of the Co-permittee.

During the term of the Permit, the Program Manager will submit, on a "joint basis", certain permit-required reports and a certification statement on behalf of the Co-permittees to the Water Board. In

[1] NPDES Permit No. CAS029718, Order No. 90-094.
[2] NPDES Permit No. CAS029718, Order No. 95-180 (as amended 7/21/99).
[3] NPDES Permit No. CAS029718, Order No. 01-024 (2/21/01).
[4] NPDES Permit No. CAS029718, Order No. 01-119, Amendment Revising Provision C.3. (10/17/01).
[5] NPDES Permit No. CAS029718, Order No. R2-2005-0035, Amendment Revising Order 01-119 (7/20/05).
[6] NPDES Permit No. CAS612008, Order No. R2-2009-0074 (10/14/09).

August 2010, Co-permittees authorized the Program to continue submitting "joint reports" and a certification statement on their behalf. A signed confirmation statement from each Co-permittee designating a MC representative and/or alternate for their agency, and authorizing the Program Manager to submit certain reports to the Water Board on their behalf is included within Appendix 1-1.

Program Annual Report

Permit Provision C.16.a of the MRP requires each Co-permittee to submit an Annual Report by September 15 of each year. Program annual reports are not required in accordance with the MRP; however, the Program's Management Committee decided at its June 17, 2010 meeting that a Program Annual Report documenting Program-wide activities is useful and should be developed each year.

■ Organization of Report

The Program's *FY 09-10 Annual Report* consists of 15 sections, with relevant tables placed at the end of each section, and one Appendix. Each section reports on a specific Permit Provision. Related tasks and activities not related to a specific Permit Provision (e.g., street sweeping, Santa Clara Basin Watershed Management Initiative (SCBWMI) activities, etc.) are placed in the most appropriate section. The structure of each Annual Report section, in most cases, consists of the following:

- Introduction – provides brief background information about the specific Permit Provision and its requirements;
- Program Activities – provides Program accomplishments for specific sub-provisions and/or projects;
- Regional Activities – provides accomplishments conducted at the regional-level (e.g., BASMAA-related tasks) for specific sub-provisions and/or projects; and

Following Section 1, the Program *FY 09-10 Annual Report* volume consists of the following sections:

Program FY 09-10 Annual Report
Section 2- Provision C.2 Municipal Operations
Section 3- Provision C.3 New Development and Redevelopment
Section 4- Provision C.4 Industrial and Commercial Site Controls
Section 5- Provision C.5 Illicit Discharge Detection and Elimination
Section 6- Provision C.6 Construction Site Control
Section 7- Provision C.7 Public Information and Outreach
Section 8- Provision C.8 Water Quality Monitoring
Section 9- Provision C.9 Pesticides Toxicity Control
Section 10- Provision C.10 Trash Controls
Section 11- Provision C.11/12 Mercury and PCBs Controls
Section 12- Provision C.13 Copper Controls
Section 13- Provision C.14 PBDE, Legacy Pesticides and Selenium
Section 14- Provision C.15 Exempted and Conditionally Exempted Discharges
Section 15- Regional Supplement for Pollutants of Concern and Monitoring

The Appendix provides final work products and other relevant information relating to the completion of Program activities. Appendices have been developed for certain Program activities described within the following Annual Report sections:

Program FY 09-10 Annual Report Appendix
Section 1- Introduction
Section 3- Provision C.3 New Development and Redevelopment
Section 6- Provision C.6 Construction Site Control
Section 7- Provision C.7 Public Information and Outreach
Section 8- Provision C.8 Water Quality Monitoring
Section 9- Provision C.9 Pesticides Toxicity Control
Section 12- Provision C.13 Copper Controls
Section 15- Regional Supplement for Pollutants of Concern and Monitoring

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Section 2

Municipal Operations

September 15, 2010

Section 2 Municipal Operations

Introduction

Provision C.2 of the MRP requires Permittees to implement appropriate best management practices (BMPs) during operation, inspection and routine repair and maintenance activities of municipal facilities and infrastructure to control and reduce non-stormwater discharges and polluted stormwater to storm drains and watercourses. The provision identifies the following specific maintenance activities that require development and implementation of BMPs:

- Street and road repair maintenance (C.2.a.),
- Sidewalk/plaza maintenance and pavement washing (C.2.b.),
- Bridge and structure maintenance and graffiti removal (C.2.c.),
- Stormwater pump stations (C.2.d.),
- Rural public works construction and maintenance (C.2.e.), and
- Corporation yards (C.2.f.).

Program Activities

The SCVURPPP Municipal Operations Ad Hoc Task Group (AHTG) was formed and first met in October 2009 to assist Co-permittees with implementing the new requirements in Provision C.2. The AHTG met four additional times from January through June 2010. During this time, the AHTG provided the following guidance to assist with implementation of the MRP:

- Pump station inventory form for collecting pump station characteristics and other information as required in Provision C.2.d.ii.(1);
- Example stormwater pollution prevention plans (SWPPPs) for corporation yards (C.2.f.i.(3));
- Draft pump station dry weather sampling plan guidance (C.2.d.ii.(2)). This sampling guidance will be revised in FY 10-11 to include wet season inspections (C.2.d.ii (4)).

To ensure consistency with inspection and reporting, the Municipal Operations AHTG worked with the BASMAA Municipal Operations Committee to identify a set of criteria to be used when conducting stormwater pump station dry season inspection and monitoring. These criteria were incorporated into the Program guidance.

Regional Activities

Program staff participated in the BASMAA Municipal Operations Committee and helped identify several activities that will be conducted at the regional level:

- Expansion of the existing BASMAA Surface Cleaner Training and Recognition Program to include mobile automotive washing and carpet cleaning and add Spanish-language information for each business type;

- Development of common forms for pump station sampling and inspections; and
- Information sharing.

As stated above, Program staff is providing SCVURPPP AHTG input on the dry weather pump station sampling form and wet weather pump station inspection form.

Santa Clara Valley
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Section 3

New Development and Redevelopment

September 15, 2010

Section 3 New and Redevelopment Control Measures

Introduction

Provision C.3 contains the requirements for appropriate source control, site design, and stormwater treatment measures in new development and redevelopment projects to address stormwater runoff pollutant discharges and prevent increases in runoff flows, with emphasis on implementation of low impact development (LID) techniques. This section of the Annual Report describes the Program's efforts during FY 09-10 to assist Co-permittees to control the impacts of development on stormwater quality and flow through the development project planning, review and approval process.

Program Activities

During FY 09-10, Program efforts continued to focus on assistance to Co-permittees with C.3 and HMP implementation, conducting training workshops for municipal staff and the development community, and implementation of new requirements in the MRP. The Program continued to support the C3 Provision Oversight Ad Hoc Task Group (C3PO AHTG) and use it as a forum to discuss Co-permittee needs, C.3 implementation issues, and updates on regional activities. The C3PO AHTG met approximately bimonthly during the first half of the fiscal year (three times) and then began to meet monthly during the second half of the year (six times) to accomplish required tasks.

In December, 2009, Program staff prepared a memorandum entitled "Guidance on Key Actions and Due Dates for Meeting C.3. Requirements" to help Co-permittees prioritize actions for compliance with the MRP. Program staff then prepared a Work Plan to assist Co-permittees in implementing all C.3. requirements, which identified whether tasks will be implemented locally, at the Program level or regionally by BASMAA, and the time frame for completion. The C.3 Work Plan was provided to the C3PO AHTG in December 2009 and after incorporation of AHTG input, submitted to the Management Committee in February 2010.

C.3.a. New Development and Redevelopment Performance Standard Implementation

The provision requires Co-permittees to update legal authority and development review and permitting processes, and conduct training and outreach to address new C.3 requirements. It also requires Co-permittees to encourage all projects not regulated by Provision C.3, but that are subject to the Co-permittees' planning, building, development, or other comparable review, to include adequate source control and site design measures.

The Program implemented the following activities to help meet this requirement:

Municipal Staff Training

During FY 09-10, the Program conducted and/or co-sponsored five workshops to assist Co-permittees with implementation of Provision C.3 and requirements for construction site management and inspection (Provision C.6):

- Construction Site Inspection Trainings, October 21, 2009, 9:00 AM – 12:00 PM and 1:00 PM – 4:00 PM (San Jose);
- Webcast on "Engineered Rainwater Collection and Case Studies For Sustainable Water Management" by ASCE Continuing Education and ASCE's Environmental & Water Resources Institute (EWRI), October 27, 2009 (Cupertino);
- Construction Site Compliance Workshop, January 19, 2010 (Cupertino) and January 20, 2010 (San Jose), co-sponsored by the San Francisco Estuary Partnership;
- Construction Site Stormwater Compliance Workshop, May 19, 2010 (SCVWD, San Jose); and
- The Annual C.3. Workshop, entitled "Complying with New Stormwater Requirements for New and Redevelopment Projects", June 8, 2010 (Cupertino).

More information on the construction-related workshops is provided in Section 6.
The Annual C.3. Workshop attracted 108 participants. The workshop was designed to address topics of interest to municipal and private planning/engineering staffs related to the MRP and LID. The morning sessions featured updates on stormwater regulations; a presentation on performance of bioretention areas, and case studies of implementation of C.3. on a variety of projects. The afternoon session was split into two tracks: one track offered an introduction to hydromodification management requirements and the Bay Area Hydrology Model. The other track offered advanced training on low impact development topics including rainwater harvesting, green roofs, soil specifications, and retrofitting impervious areas with landscaping. The advanced track was planned in coordination with the SCBWMI Land Use Subgroup. The workshop also featured exhibits for four vendors of stormwater control measures and related products. The workshop flyer, agenda, evaluation summary, and attendance list for the workshop are presented within Appendix 3-1

Development of Guidance Materials

Program staff worked with the AHTG to develop and/or update the following guidance materials:

- "Model Conditions of Approval for Stormwater Quality" (Site Design, Source Control, and Pesticide Reduction), May 2010;
- Fact sheet entitled "Changes to Stormwater Quality Control Requirements - Information for Developers, Builders and Project Applicants", July 2010;
- Updated fact sheet entitled "Hydromodification Management Requirements: What Developers, Builders and Project Applicants Need to Know", July 2010;
- General Plan Guidance, July 2010;
- Revisions to Planning Procedures Performance Standards (in progress).

Site Design Awards

In 2006, the Program began an awards program for exemplary site designs to protect water quality. This awards program recognizes Santa Clara Valley's public agency and private development community leaders who are solving site design challenges, reducing stormwater pollution and runoff quantity, and meeting the requirements of the NPDES permit. Applications for the awards program also help provide

information on additional site design examples for updating the Program's Site Design Guidebook[1]. An Awards Committee consisting of Program staff, Co-permittee representative(s), local consultant(s), and an environmental group representative reviews the submittals and selects the winners.

The Program continued the awards program in 2010, and the following award winners were announced at the June 8, 2010 C.3. Workshop:

- Private Project, Residential: The Self-Watering House, Mountain View;
- Private Project, Commercial: VMware, Palo Alto;
- Public Project: Stevens Creek Corridor Park and Restoration Project, Cupertino;
- Honorable Mention, Private Project, Institutional: The Humane Society of Silicon Valley, Milpitas.

An awards ceremony is being planned for Fall 2010, and the Site Design Guidebook will be updated in FY 10-11 to include the award-winning projects from the last few years.

C.3.b. Regulated Projects

Development of Guidance Materials

Program staff developed the following guidance documents to help Co-permittees implement requirements for different categories of new development or redevelopment projects regulated under C.3.:

- Fact sheet entitled "Notice to Project Applicants: Additional, New Stormwater Use and Treatment Requirements Will Go Into Effect December 1, 2011", December 2009[2];
- Fact sheet entitled "Requirements for Road Projects in the Municipal Regional Permit", February 2010;
- Updated "Provision C.3 Data Form" to collect information required by the MRP for annual reporting, July 2010.

Green Streets Pilot Projects

Program and Co-permittee staff formed the Green Streets Work Group to discuss the requirements for green streets and potential green street projects. This Work Group held three meetings in FY 09-10.

The City of Campbell is considering developing Hacienda Avenue in Campbell as a Green Street. Program staff assisted Campbell staff in submitting an application to the Strategic Growth Council to receive grant funding for this project. The grant application is currently under review by the Strategic Growth Council.

[1] SCVURPPP, "Developments Protecting Water Quality: A Guidebook of Site Design Examples", February, 2007
[2] SCVURPPP acknowledges the Alameda Countywide Clean Water Program for the original content of this document. It was modified for SCVURPPP co-permittee use.

C.3.c. Low Impact Development

Participation in BASMAA Development Committee

Program staff is participating in the BASMAA Development Committee to implement the requirements under this provision, as most of the requirements will initially be met by the development of regional products. Highlights of the tasks implemented by the BASMAA Development Committee in FY 09-10 are presented under the Regional Activities section below.

Development of Guidance Materials

In coordination with the Alameda and San Mateo countywide stormwater programs, Program staff hired a consultant to develop a list of plants that can be used in LID treatment measures in Santa Clara Valley. The list is currently under review by the C3PO AHTG.

C.3.f. Alternative Certification of Stormwater Treatment Systems

To assist Co-permittees in identifying third parties to conduct alternative certification reviews of stormwater plans for proposed development projects, the Program has maintained a "List of Qualified Consultants" on its website. This is a list of licensed engineers who are qualified to design or review proposed storm water treatment control measures and hydromodification flow control facilities for new and redevelopment projects. During FY 09-10, Program staff began the bi-annual process of updating this list. A Request for Qualifications notice was sent out on July 19, and responses are required by August 16, 2010.

C.3.g. Hydromodification Management

With the adoption of the MRP, the hydromodification management (HM) requirements for SCVURPPP Co-permittees changed in two significant ways: 1) the project size threshold was lowered to 1 acre of impervious surface; and 2) the HM applicability map changed to include more areas of the County. As a result of these changes, more projects will need to meet the HM requirements. Program staff conducted the following tasks to assist Co-permittees to implement the new requirements:

- Updated the fact sheet entitled "Hydromodification Management Requirements: What Developers, Builders and Project Applicants Need to Know", July 2010;
- Conducted a 2.5-hour training on the hydromodification management requirements and the Bay Area Hydrology Model ("HMP 101" as part of the C.3 Workshop on June 8, 2010;
- Developed local HM applicability maps for each Co-permittee;
- Worked with the City of San Jose and other Co-permittees on a more refined impervious surface analysis of the "Areas Under Review" noted on the HM applicability map.

C.3.h. Operation and Maintenance of Stormwater Treatment Systems

The requirements for Co-permittees to conduct BMP Operation and Maintenance (O&M) Verification Programs in the MRP are similar to those in the previous permit, except for changes in inspection frequency and reporting. Program staff updated the "Standard Stormwater Treatment BMP Inspection Data Collection Form" to be consistent with the MRP requirements. Program staff will continue to

collect annual inspection data from Co-permittees for conducting internal analyses of common BMP O&M issues.

■ Regional Activities

Program staff is participating in the BASMAA Development Committee to implement the requirements under this provision, and the Assistant Program Manager is serving as Chair of the Committee. The Development Committee identified the following MRP requirements as regional tasks, and accomplished the following tasks in FY 09-10:

- Green Street Pilot Projects – Provision C.3.b.iii. requires Permittees to construct ten pilot green street projects throughout the region (a minimum of two in Santa Clara Valley) that incorporate LID site design and treatment techniques by December 2014. The Committee finalized a scope of work for hiring a consultant to prepare annual Green Street Projects Status Reports on behalf of all Permittees and conduct modeling of water quality benefits of Green Street Projects, per Provision C.3.b.iii. and C.3.b.v.(2). An RFP was issued in June 2010.
- LID Infeasibility Criteria – Provision C.3.c.i.(2)(b)(iv) requires Permittees to submit a report on the criteria and procedures that will be used to determine whether LID measures are infeasible on a project site by May 1, 2011. The Assistant Program Manager attended several meetings of the Orange County Land Development NPDES Technical Advisory Group, which has similar permit requirements and recently developed LID infeasibility criteria, and shared information about their approach and experience with the Development Committee and the C3PO AHTG. In addition, Geosyntec, consultant to Orange County, made several presentations to the Committee about their approach. Based on this information, the Committee is in the process of formulating an approach for the San Francisco Bay area.
- Model Biotreatment Soil Media Specifications – Provision C.3.c.i.(2)(b)(vi) requires Permittees to develop a proposed set of model biotreatment soil specifications and soil media testing methods for submittal to the Water Board by December 1, 2010. The Committee organized a Bay Area Soil Specification Roundtable on April 14, 2010 that included presentations on existing specifications and collected input from various soil and plant specialists. The Committee decided to base its proposal on an existing specification developed for the CCCWP, with some modifications. The Committee then decided to contract with CCCWP's consultant to make the modifications and prepare the submittal to the Water Board. Program staff participated in the Roundtable discussion, the review, and the decision-making process.
- Green Roof Specifications – Provision C.3.c.i.(2)(b)(vii) requires Permittees to develop proposed minimum specifications for green roofs that adequately treat roof runoff consistent with MRP requirements, for submittal to the Water Board by May 1, 2011. During FY 09-10, the Committee reviewed a draft memorandum on proposed specifications developed by the Contra Costa Clean Water Program (CCCWP) and is currently discussing the content of the submittal.
- Special Projects Proposal – Provision C.3.e.ii. recognizes that certain types of "smart growth" project have inherent environmental benefits and requires Permittees to submit a proposal to allow these projects to apply "credits" to reduce the amount of LID treatment required on the site, by December 1, 2010. The Committee formed a Special Projects Work Group to address this requirement. The Work Group has met approximately monthly to identify projects that may have difficulty implementing LID on-site, develop project type descriptions, and discuss how the credits would be applied. The Work Group met with Water Board staff on April 1, 2010 to present and obtain feedback on a preliminary list of projects. The group also met with

representatives of the Building Industry Association, local developers and engineers on July 27, 2010 to get their input on the project types and approach. Program staff participated in the Work Group and both meetings.

Santa Clara Valley
Urban Runoff
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Section 4

Industrial and Commercial Site Controls

September 15, 2010

Section 4 Industrial and Commercial Site Controls

Introduction

Provision C.4 requires Permittees to implement an industrial and commercial site inspection and control program at all sites which could reasonably be considered to cause or contribute to pollution of stormwater runoff, with follow-up and enforcement consistent with local Enforcement Response Plans (ERPs), to prevent discharges of pollutants and impacts on beneficial uses of receiving waters. The provision identifies specific elements of the program including identifying sites to inspect (C.4.b.ii.(1) and (2)), inspection frequency (C.4.b.ii.(3) and (5)), inspection content (C.4.b.ii.(4)), data tracking (C.4.b.ii.(6) and C.4.c.ii.(4)) and staff training. In addition, Permittees must report on the adequacy of their legal authority and implementation of their ERP in the FY 09-10 Annual Report.

Program Activities

The SCVURPPP Industrial and Commercial Business Inspection and Illicit Discharge Detection and Elimination (IND/IDDE) Ad Hoc Task Group (AHTG) was formed in September 2009 to assist Co-permittees with implementing new requirements in the MRP. The AHTG met again in December 2009, after the MRP was adopted, and another five times through June 2010. During that time, Program staff worked with the AHTG to develop the following guidance to assist with implementation of the MRP:

- Example ERPs from within and outside the Program were collected by Program staff and distributed to the AHTG. These examples were used as guides for Co-permittees to develop individual ERPs (distributed in December 2009);
- A standardized list of industrial and commercial business categories that should be considered for inspections in each agency's Business Inspection Plan was created by the AHTG and compiled by the City of San Jose staff (completed February 2010);
- Example procedures for prioritizing business inspections were provided by Program staff. The procedures were collected from within and outside the Program. These examples were used as guides for Co-permittees to develop individual Business Inspection priorities; and
- A template Business Inspection Plan was provided by Program staff (completed July 2010).

The AHTG also assisted BASMAA with input on the Pollutants of Concern Training Materials project and the annual report format.

Regional Activities

Program staff participated in the BASMAA Municipal Operations Committee and helped identify several activities that will be conducted at the regional level. For Provision C.4, the Committee decided that regional activities would be best focused on:

- Information sharing on legal authority and enforcement response plans for industrial and commercial business inspections;

- Providing input on the Pollutants of Concern Training Materials for Inspectors, being developed by the Monitoring/Pollutants of Concern Committee to address Provision C.12.a (see Section 11 of this Annual Report);
- Annual report format for C.4 inspection data reporting; and
- Potential regional inspector trainings.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Section 5

Illicit Discharge Detection and Elimination

September 15, 2010

Section 5 Illicit Discharge Detection and Elimination

Introduction

Provision C.5 requires Permittees to implement an illicit discharge program that includes an active surveillance component, a centralized complaint collection component, and a follow-up component to target illicit discharge and non-stormwater sources. The provision identifies specific elements of the program including a central contact point for complaints and spill reporting (C.5.c.), mobile business program (C.5.d.), collection system screening program (C.5.e) and spill and discharge complaint tracking system (C.5.f). In addition, Permittees must report on the adequacy of their legal authority and implementation of their Enforcement Response Plans (ERPs) in the FY 09-10 Annual Report.

Program Activities

The SCVURPPP Industrial and Commercial Business Inspection and Illicit Discharge, Detection and Elimination (IND/IDDE) Ad Hoc Task Group (AHTG) was formed in September 2009 to assist Co-permittees with implementing new requirements in the MRP. The AHTG met again in December 2009, after the MRP was adopted, and another five times through June 2010. During that time, Program staff worked with the AHTG to provide examples and develop guidance to assist with implementation of the MRP:

- Example ERPs from within and outside the Program were collected by Program staff and distributed to the AHTG. These examples were used as guides for Co-permittees to develop individual ERPs;
- A template Spill and Dumping Response Plan with phone tree; and
- A template spill and discharge complaint tracking Excel Workbook.

The AHTG is working with the BASMAA Municipal Operations Committee to address the mobile cleaner control program requirements in Provision C.5.d. (see discussion under Regional Activities). The AHTG will follow the progress of the BASMAA Committee as new businesses under Provision C.5.d. are addressed.

The Provision C.5.e. requirement for a collection system screening program is being addressed by the SCVURPPP Municipal Operations AHTG. To ensure consistency with inspection and reporting, the Municipal Operations AHTG and BASMAA identified a set of criteria to be used by Co-permittees when conducting collection system screening. The AHTG also developed additional optional criteria for Co-permittees to consider when conducting screenings, and an inspection and monitoring template, available as guidance.

Provision C.5.e also requires that Co-permittees make maps of their municipal storm drain systems publicly available by July 1, 2010. Most Co-permittees have maps available to address this provision and some are providing plot books at the planning counter to satisfy this permit provision. Program staff also posted on the SCVURPPP website a link to the Oakland Museum Creek and Watershed Maps, which include storm drains 24 inches in diameter and larger, to help meet this requirement.

■ Regional Activities

Program staff participated in the BASMAA Municipal Operations Committee and helped identify several activities that will be conducted at the regional level. These include:

- Assistance with a program to reduce the discharge of pollutants from mobile businesses (C.5.d.);
- Development of a common collection system screening reporting form (C.5.e.); and
- Information sharing on legal authority, enforcement response, and collection system screening programs (C.5.a., b., and e.).

C.5.d. Control of Mobile Sources

This provision requires Permittees to develop and implement a program to reduce the discharge of pollutants from mobile businesses, including development and implementation of minimum standards and BMPs, and outreach to mobile businesses. BASMAA's long-standing Surface Cleaner Training and Recognition program addresses these aspects of the provision by focusing on the most common type of outdoor cleaning – cleaning of flat surfaces like sidewalks, plazas, parking areas, and buildings. Individual Permittees address the inspection and enforcement aspects of the provision.

Previously, BASMAA, the Regional Water Board, and mobile businesses jointly developed best management practices. The BMPs were packaged and delivered in training materials (e.g., *Pollution from Surface Cleaning* folder), and via workshops and training videos. The folder and the training video have since been translated into Spanish. Cleaners that take the training and a self-quiz are designated by BASMAA as Recognized Surface Cleaners. BASMAA also created and provides marketing materials for use by Recognized Surface Cleaners. Previously, BASMAA converted the delivery mechanism to being online so that mobile businesses would have on-demand access to the materials and the training. BASMAA continues to maintain the Surface Cleaner Training and Recognition Program. Cleaners can use the website to get trained and recognized for the first time or renew their training and recognition, as required annually. Recognized cleaners can also download marketing materials from the website. Potential customers, including Permittees can use the site to verify the recognition status of any cleaner, as can municipal inspectors.

For FY 10-11, BASMAA is planning to add materials and training for additional mobile business types to the Surface Cleaner Training and Recognition program.

Santa Clara Valley
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Section 6

Construction Site Controls

September 15, 2010

Section 6 Construction Site Controls

Introduction

Provision C.6 requires Permittees to implement a construction site inspection and control program at all construction sites, with follow-up and enforcement consistent with local Enforcement Response Plans, to prevent construction site discharges of pollutants and impacts on beneficial uses of receiving waters. The provision identifies specific elements of the program including six Best Management Practices (BMPs) categories (C.6.c), the plan approval process (C.6.d), inspection frequency (C.6.e.ii.(2)), inspection content (C.6.e.ii.(3)), data tracking and reporting (C.6.e.ii.(4) and iii.) and staff training (C.6.f). In addition, Permittees must report on the adequacy of their legal authority and implementation of their Enforcement Response Plan in the FY 09-10 Annual Report.

Program Activities

Co-permittee Guidance

The SCVURPPP Construction Inspection Ad Hoc Task Group (AHTG) was formed in September 2009 to assist Co-permittees with implementing the new requirements in the MRP. The AHTG met again in November 2009, after the MRP was adopted, and began developing tools to assist with implementation of the MRP, including an outline of an Enforcement Response Plan (ERP) and a model stormwater construction inspection form. In February 2010, the AHTG continued to work on developing ERPs, finalizing the model inspection form and discussed a draft Excel workbook template for construction inspection data tracking. In March 2010, the AHTG discussed guidance for identifying high priority construction sites for inspection during the wet season and reviewed the BASMAA draft reporting forms for Provision C.6. The template construction inspection Excel data tracking table was revised based on the BASMAA reporting forms and sent to the AHTG members in June 2010.

The following is a list of products developed by Program staff to assist AHTG members:

- ERP Outline (November 2009);
- Construction Inspection Form and memorandum on its use (November 2, 2009, revised November 18, 2009);
- Excel Workbook Template for Data Tracking and memorandum on its use (December 9, 2009);
- Memorandum entitled “Guidance on Identifying High Priority Construction Sites” (February 4, 2010);
- Excel Workbook Template for Data Tracking (revised June 2010).

Training

The Program conducted/co-sponsored the following construction trainings in FY 09-10:

- Construction Site Inspection Trainings, Wednesday, October 21, 2009, 9:00 AM – 12:00 PM and 1:00 PM – 4:00 PM (San Jose) – The training focused on the previous Construction General

Permit (CGP) which covered projects during the FY 09-10 wet season, inspection and enforcement procedures, and construction site management approaches. Approximately 117 municipal staff attended this training.

- Construction Site Compliance Workshop, January 19, 2010 (Cupertino) and January 20, 2010 (San Jose), co-sponsored by the San Francisco Estuary Partnership – The workshop focused on the requirements in the new CGP, stormwater BMPs for small and large construction projects, monitoring and reporting requirements and post construction stormwater management techniques. Approximately 172 municipal staff and contractors attended this training.
- Construction Site Stormwater Compliance Workshop, May 19, 2010 (SCVWD, San Jose) – The workshop focused on the requirements in the new CGP, with emphasis on the new monitoring and reporting requirements, linear utility projects and the SMARTS web tool for submitting permit-required documents. Approximately 62 municipal staff attended this training.

The agendas, attendance lists and evaluation summaries for these workshops are provided in Appendix 6-1. Presentations given at the workshops are available on the Program website www.scvurppp.org.

The Program also purchased subscriptions to the new CASQA Construction BMP Handbook portal for Co-permittees' use.

■ Regional Activities

Program staff participated in the BASMAA Development Committee, which identified the following regional activities related to Construction Site Control: 1) development of the annual reporting format for construction inspection data summaries required by the MRP; and 2) update of construction BMP outreach materials. Program staff developed the C.6. annual reporting format for the Committee's review and revised the format in response to Committee members' and Water Board staff's comments. The Committee determined that the existing regional outreach materials, including "Blueprint for a Clean Bay", BMP Plan Sheet and BMP tri-fold brochures, needed to be redone based on the intended audiences and the inspectors' needs. This task will be conducted in FY 10-11.

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Section 7

Public Information and Outreach

September 15, 2010

Section 7 Public Information and Outreach

Introduction

The goals of the Public Information and Outreach (Public Information and Participation or PI/P) element of the Program are to identify and change behaviors that adversely affect water quality, and to increase the understanding and appreciation of streams and the Bay. The Program's FY 09-10 PI/P Work Plan provided a strategy to achieve these education and public participation goals with specific projects funded in the Program's FY 09-10 budget.

Highlights of the accomplishments of FY 09-10 PI/P projects and ongoing projects from previous years are described in the sections below according to permit requirements.

FY 09-10 PI/P projects included the following:

- Program Activities
  - Advertising Campaign – Watershed Watch Campaign
  - Public Outreach Events
  - Citizen Involvement Events - Watershed Watchers Program at the Don Edwards San Francisco Bay National Wildlife Refuge, and funding for advertising the National River Cleanup Day.
  - School-Age Children Outreach - ZunZun School Assemblies and Watershed Watchers Program at the Don Edwards San Francisco Bay National Wildlife Refuge.
- Regional Activities
  - BASMAA Media Relations Project
  - BASMAA IPM Store Partnership Program
  - BASMAA Regional Advertising Campaign

FY 09-10 Program Activities

C.7.b. Advertising Campaigns

The cornerstone of the Program's outreach activities is the Watershed Watch Campaign (Campaign). The Watershed Watch Campaign completed 10 years of implementation (and 9 years of advertising) in FY 09-10. The Campaign implemented various outreach activities including media advertising.

A draft FY 09-10 Campaign Work Plan was submitted with the Program's FY 09-10 Work Plan on March 1, 2009 and is included within Appendix 7-1. The Watershed Watch Media Advertising Plan, completed in June 2009 is also included within Appendix 7-1.

The following describes tasks completed by the Program's consultant, with assistance from Program and Co-permittee staff, during FY 09-10. The detailed Watershed Watch Campaign and Media Report is included in Appendix 7-1.

- **Task 1: Creative Development** –Updated Spanish "Green Gardener" class radio spot with fall 2009 class date information. Developed new television and transit (bus back posters).
- **Task 2: Media Advertising** – Conducted a media promotion consisting of print, radio, television, and transit advertising. Advertisements ran from August 2009 to June 2010. Media buys included 27 (26 paid and one free) print advertisements, 722 (466 paid and 256 free) radio advertisements, 3,054 (1,456 paid and 1,598 free) television advertisements, and 50 (33 paid and 17 free) transit advertisements. The net advertising budget for media was $80,402. This includes$3,000 contributed by the cities of Sunnyvale, Milpitas and Cupertino transit advertising on litter. Media partners provided a total added value package of benefits and resources of $203,807.58. The Campaign also began using social networking media, i.e., Facebook and Twitter to conduct outreach. Additional details on the media campaign are in the Watershed Watch Campaign Annual Report included in Appendix 7-1.
- **Task 3: Partnership Development and Coordination** – Continued development of the partner database and conducted meetings with potential partners. Developed six new partnerships, including two community/business partners (Jiffy Lube and Happy Hollow) and three media partners (KBRG Spanish Radio, Yahoo.com/MercuryNews.com, Valley Transit Authority, and Lamar Transit). Jiffy Lube and Happy Hollow are offering discounts to customers using the Watershed Watch discount card. A list of current partners is provided in Appendix 7-2.
- **Task 4: Added Value Development** – As a result of media partnership negotiations and community partnership activities, the Campaign received significant added-value resources. These include free advertising, partnership discounts, live promotions, etc. The estimated total added-value to the FY 09-10 Campaign from partners (community and media) is $133,521. Additional details are included in the Watershed Watch Campaign Annual Report included in Appendix 7-1.
- **Task 5: Website Maintenance** – Implemented a major update of the Watershed Watch website. The updated website was launched on April 5, 2010. Continued to maintain the Watershed Watch website. The Watershed Watch Web Statistics Report is included in Appendix 7-3.
- **Task 6: Events Coordination** – Coordinated and attended community outreach events. The consultant staffed five outreach events including three promotional car wash events.
- **Task 7: Public Relations** – Pitched an article about the Santa Clara Valley Green Gardener Program to El Observador. It ran in the September 25, 2009 publication. Began using social networking sites (Facebook and Twitter) to promote Campaign messages.
- **Task 8: FY 10-11 Work Plan and FY 09-10 Annual Report Development** – Developed the FY 10-11 Work Plan and the FY 09-10 Campaign and Media Report. Submitted monthly Campaign reports to the Management Committee.

Evaluation of Effectiveness

Many factors indicate that the FY 09-10 Watershed Watch Campaign was a success (see the FY 09-10 Watershed Watch Campaign Report in Appendix 7-1). Some of these include:

- The continued successful partnership with Classic Car Wash and Premier Car Wash;
- Developed six new partnerships, KBRG Spanish Radio, Valley Transit Authority, Yahoo.com/MercuryNews.com, Lamar Transit, Happy Hollow Park and Zoo and Jiffy Lube. In addition, key contacts have been made for other potential new partners in the new fiscal year;

- The large number of gross impressions made by media advertising 23,193,670;
- Media partners provided $129,405 in added-value resources, which greatly supplemented the Campaign's total media buy of $80,402; and
- The completion of all tasks in the FY 09-10 scope of work, with active participation of Program and Co-permittee staff.

C.7.c. Media Relations – Use of Free Media

On February 6, 2010, the Action Line Column in the *San Jose Mercury News* included a letter about draining pool water. This letter offered a good opportunity to educate *San Jose Mercury News* readers about the proper draining of pools and spas. Program staff developed a response and emailed it to Action Line columnist Dennis Rockstroh. Mr. Rockstroh printed the Program's response in his column on February 24, 2010. It included links to the Watershed Watch website and the online version of "Draining Pools and Spas" brochure. A copy of the response is included in Appendix 7-8.

During FY 09-10, the Program also participated in the BASMAA Media Relations Project which conducted three pitches. The pitches were on pesticides, car washing, and litter, relating specifically to plastic bags.

Evaluation of Effectiveness

The pitches resulted in thirty-eight media placements: six in print; eleven on the radio; and twenty-one online (this included radio station and newspaper websites). Additional details are included in the BASMAA Media Relations Final Report included in Appendix 7-8.

C.7.d. Stormwater Point of Contact

Program's Toll-Free Telephone Numbers

The Program maintained two toll free telephone numbers, the Program's information number (800-794-2482) and the Watershed Watch hotline (866-WATERSHED), for calls from the general public and requests for information. Program and Watershed Watch consultant staff continued to maintain the Program and Watershed Watch websites respectively.

Individual agency points of contact are publicized on Program outreach materials and websites and the point of contact is maintained by the Program and their authorized agents. The Management Committee Contact List and the Construction-Illegal Discharge-Industrial Inspection Contact List are included in Appendix 7-4.

Evaluation of Effectiveness

The Watershed Watch website continued to receive a large number of visits this year. Program staff received 27 requests on the Watershed Watch website for outreach materials, and 18 requests for information. Program staff also responded to approximately 20 calls from the public in FY 09-10. Material requests were mailed to residents within the United States.

C.7.e. Public Outreach Events

Program staff, the Watershed Watch consultant, and Co-permittees staffed ten events at which IPM and storm water pollution prevention outreach was conducted. Events were selected based upon target audience and expected attendance. Outreach events in FY 09-10 included:

- Pumpkins in the Park, October 10, 2009
- Muslim Green Fair, October 18, 2009
- Haunted History, October 31, 2009
- Spring Garden Market, April 10, 2010
- NVIDIA Corp. Earth Day Event, April 22, 2010
- Spring in Guadalupe Gardens, April 24, 2010
- Robertsville Classic Car Wash, May 5, 2010
- Delta Queen Classic Car Wash, May 19, 2010
- Capitol Premier Car Wash, June 2, 2010
- Festival in the Park, June 26, 2010

Staff distributed the following brochures at the events: Less-Toxic Pest Management fact sheets, "10 Most Wanted Backyard Bugs" brochures, "You are the Solution to Water Pollution" brochures, "Clean Cars & Clean Creeks" brochures, and giveaways (e.g. flyswatters, OWOW magnets, notepads, and temporary tattoos). The flyswatters have the Watershed Watch website and hotline number and the words "The Original Earth-Friendly Pest Control" printed on them. The beanbag game for children was used at most of the outreach events.

Evaluation of Effectiveness

Event staff distributed approximately 5,176 fact sheets, brochures and giveaways. Additional details on each event are provided in Table C.7.e Outreach Events Reporting.

C.7.f. Watershed Stewardship Collaborative Efforts

Santa Clara Basin Watershed Management Initiative (SCBWMI)

During FY 09-10, the Program continued to participate in the Santa Clara Basin Watershed Management Initiative (SCBWMI). Program staff participated in the following activities:

- Core Group participation – Program staff participated in the WMI Core Group and reviewed work products as needed.
- Trash Summit – In FY 09-10, the WMI launched a "Zero Litter Initiative" (ZLI) to address litter problems in Santa Clara Valley. Program staff participated in ZLI meetings and helped plan the WMI Trash Summit held on May 10, 2010. The Program provided funding to purchase lunch for Summit participants. Additional information about the ZLI and its relationship to SCVURPPP trash control activities is presented in Section 10 of this Annual Report.
- Product Action Committee (earlier called Product Stewardship Committee) – Program staff participated in the WMI Product Action Committee. The Committee began planning a "Plastics

Summit", to be held in fall 2010. The Summit will bring together interested parties to talk about plastic litter issues at local, state, national and international levels. The Program also continued to financially support and track the efforts of the California Product Stewardship Council.

- SCBWMI Land Use Subgroup – Program staff participated in the SCBWMI Land Use Subgroup (LUS) and implemented the following activities:
  - Prepared meeting agendas and meeting summaries
  - LUS initiated collaboration with the Going Native Garden Tour (GNGT) to help incorporate gardens featuring watershed-friendly site designs into their 2011 tour. Program staff provided input for modifying the 2011 Garden Submission Form to capture information on watershed-friendly site designs. In addition, LUS began coordinating with Acterra to update the "Soak it Up!" brochure.
  - Assisted with developing the advanced track of the Program's annual C.3 Workshop held on June 8, 2010. Specific tasks included identifying and coordinating speakers for the advanced track which included low impact development topics such as rainwater harvesting, green roofs, soil specifications, and retrofitting impervious areas with landscaping.

Going Native Garden Tour

The Program provided funding to support the Going Native Garden Tour (GNGT) held on April 18, 2010. There were approximately 12,447 visits to the gardens. The tour featured 67 gardens that demonstrated environmentally sensitive gardening practices with an emphasis of reduced water use, reduced chemical and pesticide use and improved habitat using California native plants. The GNGT Summary Report is included in Appendix 7-5

C.7.g. Citizen Involvement Events

The Program provided funding for the following citizen involvement events:

1) Citizen involvement events at the Don Edwards San Francisco Bay Wildlife Refuge (Refuge) – A number of citizen involvement and stewardship programs were conducted as part of the Program funded Watershed Watchers Program at the Refuge. Participants worked in the Refuge gardens planting native plants, pulling non-native plants, and mulching. More details are included in the Watershed Watchers Report in the Program Annual Report Appendix 7-6.
2) National River Clean-up Day – The Program provided funding to conduct advertising to promote the National River Clean-up Day held on May 15, 2010.

Evaluation of Effectiveness

Citizen Involvement Events at the Refuge – Approximately 57 people participated in the citizen involvement events conducted at the Refuge.

Creek Clean-up Events - In FY 09-10, the Creek Connection Action Group sponsored two creek clean-up events: Coastal Clean-up Day on September 19, 2009 and National River Clean-up Day on May 15, 2010. The Program provided financial support for one of the events (National River Clean-up Day). During National River Clean-up Day, a total of 1,068 volunteers participated in cleaning 34 sites and removed approximately 29,098 pounds of trash and 6,394 pounds of recyclables. During the course of both

clean-up events, a total of 2,554 volunteers participated in cleaning 69 sites and removed approximately 66,164 pounds of materials (trash and recyclables) from local creeks.

Results by clean-up event for FY 09-10 are as follows:

	Coastal Clean-up Day September 19, 2009	National River Clean-up Day May 15, 2010	Total
Number of sites	35	34	69
Number of volunteers	1,486	1,068	2,554
Pounds of recyclables	7,499	6,394	13,893
Pounds of trash	23,173	29,098	52,271
Pounds of material (trash plus recyclables)	30,672	35,492	66,164

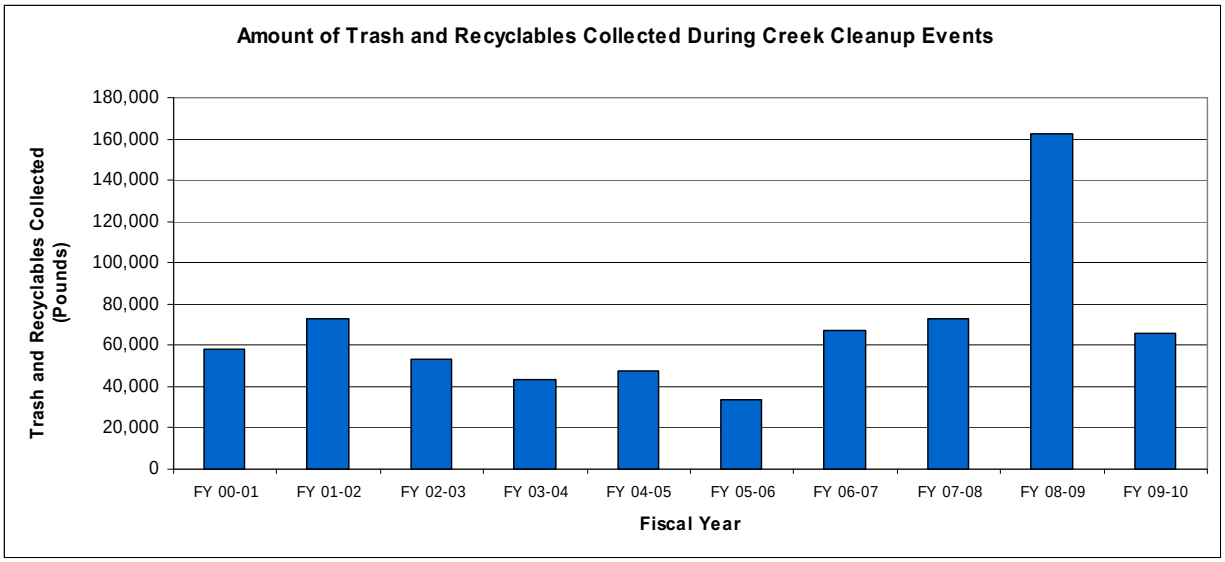
To evaluate the effectiveness of the two annual creek clean-up events, data from the past ten years of events were compiled and reviewed. The table below presents the total numbers of sites, numbers of volunteers, and pounds of materials collected each year.

Summary Results of Creek Clean-up Events, September 1998 – June 2010

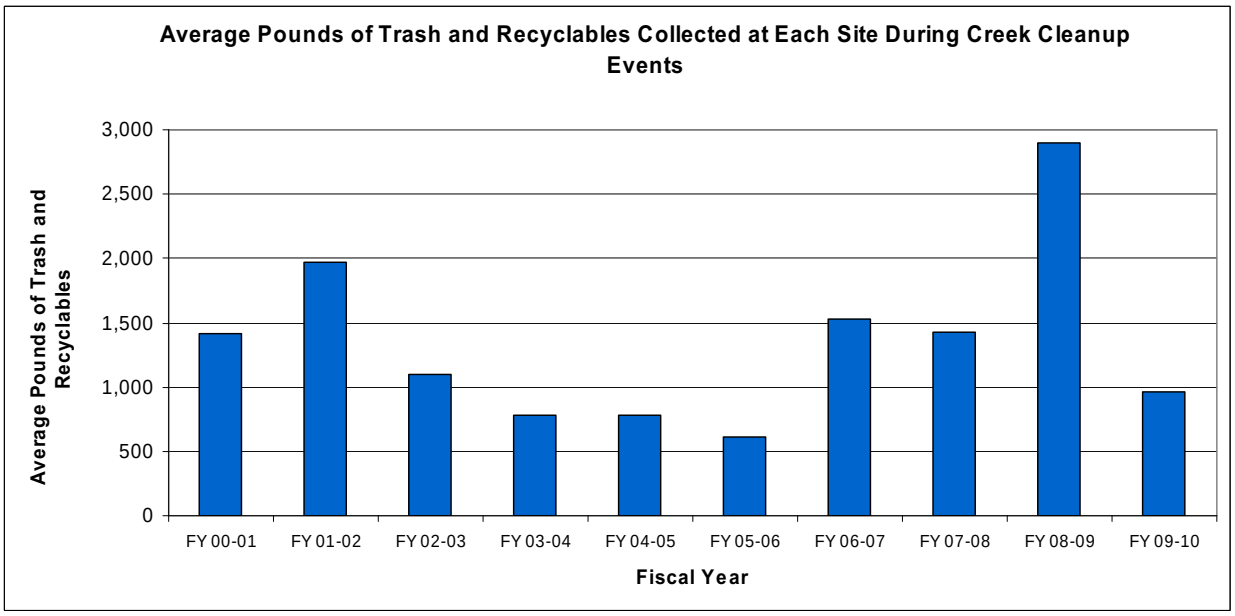
	No. of sites	No. of volunteers	lbs. of recyclables	lbs. of trash	Total lbs. collected	Average lbs./site
FY 00-01	41	1,745	n/a	58,108	58,108	1,417
FY 01-02	37	1,742	13,750	59,340	73,090	1,975
FY 02-03	48	2,091	8,071	44,883	52,954	1,103
FY 03-04	56	1,943	6,537	36,718	43,255	778
FY 04-05	61	1,618	7,890	39,730	47,620	781
FY 05-06	55	1,458	4,110	29,248	33,358	607
FY 06-07	44	1,631	15,394	52,067	67,461	1,533
FY 07-08	51	1,534	23,570	49,194	72,764	1,427
FY 08-09	56	2,298	38,960	123,591	162,551	2,903
FY 09-10	69	2,554	13,893	52,271	66,164	958
Annual Average	52	1,861	14,686	54,515	67,733	1,348
Total	518	18,614	132,175	545,150	677,325	13,482

Beginning in FY 01-02, some site managers implemented a procedure for separating out recyclable materials from trash prior to weighing it. Thus, the total pounds of material collected are the sum of the recyclables and trash quantities. According to the Santa Clara Valley Water District, this procedure is done more frequently at Coastal Clean-up Event sites than at National River Day sites. Since this procedure is not done at all sites, it is more appropriate to compare the total quantities of materials collected rather than the individual components.

The total amount of trash and recyclables collected during the two creek cleanup events each year are plotted in the figure below:



The average pounds of trash and recyclables collected at each site during the two creek cleanup events each year are plotted in the figure below:



The data in the table and figures indicate that the total amount of trash and recyclables collected shows a decreasing trend from FY 00-01 to FY 05-06, but an increasing trend from FY 06-07 to the present. This increase is related to targeting and addressing the most problematic trash problem areas (not including homeless encampments) with significant amounts of trash. In the past, some sites were chosen due to their familiarity and close proximity to certain local organizations participating in the creek cleanup. In some instances, these sites did not have significant levels of trash. In addition, the number of sites and the number of volunteers increased in FY 09-10.

Volunteers are becoming more aware of current trash issues within local creeks and the San Francisco Bay. As a result, the level of effort of removing all observed trash and recyclables has increased

resulting in more thorough trash cleanups. Co-permittees intend to continue participating in future creek cleanups, as they provide a valuable opportunity for citizen participation as well as an important element of a trash management program.

Table C.7.g. describes the Program-funded FY 09-10 citizen involvement events including evaluation of effectiveness.

C.7.h. School-Age Children Outreach

ZunZun Musical Assembly

Each year the Program sponsors up to 50 ZunZun assemblies at elementary schools in the Santa Clara Valley. These bilingual musical assemblies educate elementary school students and their teachers on watersheds and urban runoff pollution prevention. ZunZun performances use physical comedy, audience participation and musical instruments to educate teachers and children about watersheds and stormwater pollution prevention.

The Program's Schools and Youth Education and Outreach Work Group provide a list of schools for ZunZun to contact. In addition to schools with high Hispanic populations, the list includes schools with high Asian/Pacific Islander populations. A list of 170 schools was provided to ZunZun in FY 09-10.

Evaluation of Effectiveness

In FY 09-10, ZunZun conducted 47 assemblies at elementary schools in Santa Clara Valley. In addition, two assemblies were conducted at the Pumpkins in the Park event and one at the Water Wizards festival. The assemblies reached approximately 14,161 students and their teachers in grades K-6.

ZunZun assemblies were evaluated using postage-paid evaluation cards that were distributed to all teachers present at the performances. The Program received completed evaluation cards from 130 teachers. Overall, the feedback has been very positive and indicates an increase in the students' knowledge about watersheds and pollution prevention. The FY 09-10 Teacher Evaluation Report and the FY 09-10 ZunZun School Assembly Report are included in Appendix 7-7.

Watershed Watchers Program at the Refuge

The Program funds an interpretive specialist position to conduct the Watershed Watchers Program at the Refuge. The Watershed Watchers program conducts numerous activities and sessions to educate children about watersheds and urban runoff pollution prevention. These include marsh walks, gardening events, bird watching, wildlife observation etc.

Evaluation of Effectiveness

In FY 09-10, Refuge staff conducted 104 educational activities and sessions, attracting a total of approximately 3,659 people. Participants included 80 pre-kindergarteners, 1,359 elementary school students, 33 middle school students, and 199 high school students. A copy of the Watershed Watchers Fourth Quarter Report is included in Appendix 7-5.

Additional details on the Program's schools outreach activities are included in Table C.7.h. School- Age Children Outreach.

■ FY 09-10 Regional Activities

The Program participated in the BASMAA PIP Committee which implemented the following projects:

Media Relations Campaign – The BASMAA Media Relations Project conducted three pitches in FY 09-10. The pitches were on pesticides, car washing, and litter caused by plastic bags. The pitches resulted in thirty-eight media placements: six in print; eleven on the radio; and twenty-one online (this included radio station and newspaper websites). More details are included in the BASMAA Media Relations Final Report included in Appendix 7-8.

Regional IPM Partnership Program – The Regional IPM Partnership Program (also known as *Our Water, Our World* program) implemented the following activities in FY 09-10.

- Coordinated program implementation with major chains Home Depot, Orchard Supply Hardware, and Ace Hardware National. OSH reported "natural insecticides" sales up 8.5% compared to previous year. Home Depot increased their less toxic offerings 17.2%.
- Coordinated a master print run of the following: fact sheets, shelf talkers, literature rack signage, banner, beneficial bug brochure, business card, magnet, Pest or Pal activity guide for kids, pocket guide, and Pests Bugging You? booklet.
- Updated less-toxic Product Lists: Master – by brand name version; by pest version, and OSH and Home Depot-specific lists/labels.
- Maintained the *Our Water, Our World* website , and provided the Ask-the-Expert service.
- Provided and staffed exhibitor booths at the following events:
  - Excel Gardens Dealer Show (August 2009)
  - Ace Hardware National Show (October 2009) (see attached photo)
  - L&L Dealer Show (October 2009)
  - NorCal trade show (February 2010)
- Provided on-call assistance (e.g., display set-up, training, IPM materials review) to specific stores (e.g., OSH, Walgreens).
- Conducted print advertising in the Green Zebra guide, Bay Nature magazine, and Bringing Back the Natives Garden Tour's garden guide.
- Provided assistance to supplier Excel Garden Products to identify all their less toxic products and to include mention of *Our Water, Our World* in their catalog.
- Made presentations at the following events:
  - Excel Gardens Dealer Show (August 2009)
  - Urban Pesticide Committee (September 2009)

Additional details and copies of advertisements are included in Appendix 9-3 Regional IPM Partnership Report.

Regional Advertising Campaign – Through the BASMAA Public Information / Participation (PI/P) Committee, Permittees decided in December 2009, shortly after the MRP took effect, to take a broader

view of some of its regional tasks (e.g., Regional Advertising Campaign, Regional Media Relations, *Our Water, Our World* program) to ensure that work on individual MRPprovisions was coordinated and part of an overall strategy. The broader strategy will include all audiences related to the MRP provisions and ways of reaching them (e.g., advertising, media relations, schools outreach, events). Although the scope of the strategy will be broad, the level of stormwater agency (regional, areawide program, city) implementing each part will vary (i.e., each part will not be implemented via BASMAA). The strategy will be multi-year and also include recommendations for creative, media placement, media relations, partnerships, and evaluation. During the remaining portion of FY 09-10, the PI/P Committee developed and released a Request for Qualifications, and interviewed and selected a firm to develop a Regional Outreach Strategic Plan.

Regional Point of Contact - BASMAA continued to maintain the Baywise website (www.Baywise.org) as a regional point of contact. In FY 09-10, BASMAA enhanced the website by listing and/or linking to member programs' lists of points of contact, and contact information for the stormwater agencies in the Bay Area.

C.7.e. ► Public Outreach Events - Outreach Events Reporting Table

Program staff, the Watershed Watch consultant, and Co-permittees staffed ten outreach events in FY 09-10. Events were selected based upon target audience and attendance. Materials distributed at the events included the following: Less Toxic Pest Management fact sheets, "10 Most Wanted Backyard Bugs" brochures, "Don't Plant a Pest" brochure, "You are the Solution to Water Pollution "brochures, "Clean Cars & Clean Creeks" brochure, and giveaways (e.g. flyswatters, OWOW magnets, notepads, and temporary tattoos). The flyswatters have the Watershed Watch website and hotline number and the words "The Original Earth-Friendly Pest Control" printed on them. The beanbag game for children was used at most of the events. Event staff distributed more than 5,000 outreach materials and giveaways.

Event Details	Focus & Short Description	Evaluation of Effectiveness
Name: Pumpkins in the Park Date: October 10, 2009 Location: Guadalupe River Park and Gardens, San Jose Region: Countywide	Type of Event: Community fair Audience: Families with children Message: Stormwater pollution prevention, less-toxic pest control and, proper disposal of household hazardous waste (HHW).	General Feed Back: The event was very well attended. A lot of attendees stopped at the booth to play the bean bag game and pick up brochures. This is a good event for educating families with children. Estimated Overall Event Attendance: 12,000-14,000. Number of Brochures Distributed: 432 Number of Giveaways Distributed: over 1,000
Name: Muslim Green Fair Date: October 18, 2009 Location: 3003 Scott Blvd., Santa Clara Region: Countywide	Type of Event: Community fair Audience: Families with children Message: Stormwater pollution prevention, less-toxic pest control and, proper disposal of HHW	General Feed Back: This is a good event for reaching members of the Muslim community. The bean bag game was used at this event. Estimated Overall Event Attendance: 1,000 Number of Brochures Distributed: 14 Number of Giveaways Distributed: 221
Name: Haunted History Date: October 31, 2009 Location: History Park at Kelley Park, San Jose Region: Countywide	Type of Event: Halloween Event Audience: Families Message: Stormwater pollution prevention.	General Feed Back: This event is good for getting the Program's name out, but not for educating attendees. Most children stop at the booth only for candies and are not receptive to information. Estimated Overall Event Attendance: 1,500 Number of Brochures Distributed: 12 Number of Giveaways Distributed: 267
Name: Spring Garden Market Date: April 10, 2010 Location: History Park at Kelley Park, San Jose Region: Countywide	Type of Event: Plant sale Audience: Home owners/gardeners Message: Stormwater pollution prevention, less-toxic pest control	General Feed Back: Most people came to the event to buy plants and did not want to pick up information. The Program will probably not attend this event next year. Estimated Overall Event Attendance: 3,000 Number of Brochures Distributed: 181 Number of Giveaways Distributed: 61
Name: NVIDIA Corp. Earth Day Event Date: April 22, 2010 Location: 2701 San Tomas Expwy, Santa Clara Region: Countywide	Type of Event: Corporate event Audience: Information Technology Professionals Message: Stormwater pollution prevention, less-toxic pest control	General Feed Back: The event was held during lunch hour in the cafeteria and very well attended. Most employees stopped at the booth to ask questions and take brochures. Estimated Overall Event Attendance: 500 Number of Brochures Distributed: 60 Number of Giveaways Distributed: 183

C.7.e. ► Public Outreach Events - Outreach Events Reporting Table

Event Details	Focus & Short Description	Evaluation of Effectiveness
Name: Spring in Guadalupe Gardens Date: April 24, 2010 Location: Guadalupe River Park and Gardens, San Jose Region: Countywide	Type of Event: Community fair, plant sale. Audience: Families with children, homeowners and gardeners Message: Stormwater pollution prevention, less-toxic pest control and, proper disposal of HHW.	General Feed Back: Good attendance at booth. Most people were looking for specific pest control information. The bean bag toss game was used. Estimated Overall Event Attendance: 4,500 Number of Brochures Distributed: 423 Number of Giveaways Distributed: 797
Name: Watershed Watch Car Wash Event Date: May 5, 2010 Location: Robertsville Classic Car Wash, 5005 Almaden Expwy, San Jose Region: Countywide	Type of Event: Car Wash Audience: Car wash customers Message: Stormwater pollution prevention, proper car washing.	General Feed Back: Excellent turn-out, resulted in a 50% increase of business for the car wash during the 2-hour time period. Event staff spoke with customers and provided them information on proper car washing. Most people were interested in taking the Watershed Watch discount card. Estimated Overall Event Attendance: 150 Number of Brochures Distributed: 103 Number of Watershed Watch Discount Cards Distributed: 129
Name: Watershed Watch Car Wash Event Date: May 19, 2010 Location: Delta Queen Classic Car Wash, 981 E Hamilton Ave, Campbell Region: Countywide	Type of Event: Car Wash Audience: Car wash customers Message: Stormwater pollution prevention, proper car washing.	General Feed Back: Due to a rainy day forecast, attendance was low at this event. Estimated Overall Event Attendance: 45 Number of Brochures Distributed: 34 Number of Watershed Watch Discount Cards Distributed: 49
Name: Watershed Watch Car Wash Event, Date: June 2, 2010 Location: Capitol Premier Car Wash, 735 Capitol Expwy Auto Mall, San Jose Region: Countywide	Type of Event: Car Wash Audience: Car wash customers Message: Stormwater pollution prevention, proper car washing.	General Feed Back: Good turn-out. Car wash owner indicated there was an increase in business from their normal expectations. Estimated Overall Event Attendance: 100 Number of Brochures Distributed: 101 Number of Watershed Watch Discount Cards Distributed: 107
Name: Festival in the Park Date: June 26, 2010 Location: Hellyer County Park, San Jose Region: Countywide	Type of Event: Community Health Fair Audience: Families with children. Message: Stormwater pollution prevention, less-toxic pest control and, proper disposal of HHW.	General Feed Back: Good event for reaching the Hispanic community. The bean bag game drew a lot of families with children to the booth. Estimated Overall Event Attendance: 5,000 Number of Brochures Distributed: 418 Number of Giveaways Distributed: 365

C.7.g. ►Citizen Involvement Events

The Program provided funding for the following citizen involvement events:

1) National River Clean up Day – The Program supports the involvement of Santa Clara County citizens by providing advertising support for the National River Clean-up Day.
2) Citizen involvement events at the Don Edwards San Francisco Bay Wildlife Refuge (Refuge) – A number of citizen involvement and stewardship programs are conducted as part of the Program funded Watershed Watchers Program at the Refuge. Participants usually work in the Refuge gardens planting native plants, pulling non-native plants, and mulching. More details are included in the Watershed Watchers Report in the Program Annual Report Appendix 7-5.

Event Details	Description	Evaluation of effectiveness
Name: Summer of Service Programs Date: 7/16/09, 7/30/09, 8/13/09 Location: Don Edwards Wildlife Refuge, Alviso Focus: Countywide	Partnership program between Santa Clara Valley youth groups and the Watershed Watchers program. Youth spend a day at the Refuge and they work in the gardens in the morning and explore the Refuge in the afternoon.	Number of attendees on 7/16/09: 2 elementary school students and 6 middle school students. Number of attendees on 7/30/09: 10 middle school students. Number of attendees on 8/13/09: 8 middle school students.
Name: Gardening at the Refuge Date: 11/21/09 Location: Don Edwards Wildlife Refuge, Alviso Focus: Countywide	Participants usually work in the Refuge gardens planting native plants, pulling non-native plants, and mulching.	Number of attendees: 4 elementary school students, 2 high school students, and 9 adults.
Name: Community Service Days Date: 1/16/10, 3/20/10, 4/17/10, 5/17/10 Location: Don Edwards Wildlife Refuge, Alviso Focus: Countywide	This is an open day for the general public. Participants work in the gardens planning native plants, puling non-native plants, and mulching.	Number of attendees on 1/16/10:1 elementary school student, 1 high school student, and 6 adults. Number of attendees on 3/20/10: 1 elementary school student and 6 adults. Number of attendees on 4/17/10: 4 elementary school students and 4 adults. Number of attendees on 5/17/10: 13 elementary school students and 7 adults.
Name: National River Cleanup Day Date: 5/15/10 Location: Various locations throughout the County Focus: Countywide	In FY 09-10, the Creek Connection Action Group sponsored two creek clean-up events: Coastal Clean-up Day on September 19, 2009 and National Rivers Clean-up Day on May 15, 2010. The Program provided funding for the National Rivers Clean-up Day advertising.	A total of 1,068 volunteers participated in cleaning 34 sites and removed approximately 29,098 pounds of trash and 6,394 pounds of recyclables from creeks.

C.7.h. ►School-Age Children Outreach

Outreach to school-age children is implemented through ZunZun assemblies at local elementary schools and the "Watershed Watchers" program at the Environmental Education Center at the Don Edwards San Francisco Bay Wildlife Refuge (Refuge) in Alviso. The Program sponsors up to 50 ZunZun assemblies at elementary schools in Santa Clara Valley and funds an Interpretive Specialist position at the Refuge for conducting activities and programs about watershed and urban runoff pollution prevention. The Fourth Quarter "Watershed Watchers" Report including the End-of-Year summary is included in the Program Annual Report Appendix 7-5. The ZunZun Final Report is included in the Program Annual Report Appendix 7-7.

Program Details	Focus & Short Description	Number of Students/Teachers reached	Evaluation of Effectiveness
Name : ZunZun Musical Assembly Grade or level: elementary	Interactive, musical school assemblies educating K-6 children about watersheds and pollution prevention.	14,161 students	ZunZun assemblies were evaluated using postage-paid evaluation cards that were distributed to all teachers present at the performances. The Program received 130 completed evaluation cards from teachers. Overall, the feedback is positive and indicates an increase in the students' knowledge about watersheds and pollution prevention. A few highlights of the evaluations are: • Twenty-two teachers indicated that after the performance, 50% of their students knew what a watershed is; 51 teachers indicated that 75% of their students knew what a watershed is and 28 teachers indicated that 100% of their students knew what a watershed is. • Eight teachers indicated that after the performance, 50% of their students could name a way to prevent pollution in the watershed; 38 teachers indicated that 75% of their students could name a way to prevent pollution in the watershed; and 78 teachers indicated that 100% of their students could name a way to prevent pollution in the watershed. The Final Teacher Evaluation Report is included in the Program Annual Report Appendix 7-7.

C.7.h. ►School-Age Children Outreach

Program Details	Focus & Short Description	Number of Students/Teachers reached	Evaluation of Effectiveness
Name: Watershed Watchers Program at Don Edwards Wildlife Refuge in Alviso Grade or level: elementary, middle, high school	The Refuge offers a number of interpretive programs to educate children and youth about preventing urban runoff pollution. These include: Bike the Levees; Discover Native Species; Habitat Exploration; Living Wetlands; Marshes, Mud and Plankton; Quackers and Honkers; and Water Water Everywhere.	80 pre-kindergarteners, 1,359 elementary school students, 33 middle school students, and 199 high school students	Visitor Surveys are used to determine visitor demographics, effectiveness of publicity, and the effectiveness or the Watershed Watchers Program. In addition, an "Urban Runoff Bead Drop" display is used to record actions (e.g., pick up litter, spread the word, take car to car wash) that children promise to do the help keep storm drains clean. Results of both these evaluation mechanisms are summarized in the Watershed Watchers Fourth Quarter Report included in the Program Annual Report Appendix 7-5.

Santa Clara Valley
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Section 8

Water Quality Monitoring

September 15, 2010

Section 8 Water Quality Monitoring

Introduction

Since its inception, the Program has maintained an effective and scientifically sound water quality monitoring program that has provided Co-permittees, the Water Board and other stakeholders with invaluable information on the condition of water quality and associated beneficial uses in Santa Clara Basin creeks and the San Francisco Bay Estuary (Bay). Provision C.8 of the MRP requires Co-Permittees to continue conducting water quality monitoring and associated projects during the Permit term. Although monitoring requirements have become more prescriptive and expanded significantly under the MRP, the goal generally remains the same - develop high quality information on water quality in local creeks and the Bay that leads to effective municipal stormwater management.

Water quality monitoring activities were conducted at the Program and regional levels during FY 09-10. This section provides a summary of water quality monitoring activities/projects conducted at each level. Summaries of the following C.8 sub-provisions, organized by Permit provision or by major heading (both marked in bold), are included in this section:

- Compliance Options (C.8.a)
- San Francisco Estuary Receiving Water Monitoring (C.8.b)
- Creek Status Monitoring (C.8.c)
- Monitoring Projects (C.8.d)
- Pollutants of Concern and Long-Term Trends Monitoring (C.8.e)
- Citizen Monitoring and Participation (C.8.f)
- Reporting (C.8.g)
- Monitoring Protocols and Data Quality (C.8.h)

Program Activities

C.8.a. Compliance Options

Provision C.8.a allows Permittees to address monitoring requirements through a “regional collaborative effort”, their stormwater program and/or individually. On June 29, 2010, Co-permittees notified the Water Board in writing of their agreement to participate in a regional monitoring collaborative to address all requirements in Provision C.8. The regional monitoring collaborative is referred to as the BASMAA Regional Monitoring Coalition (RMC). The RMC is focused on providing a forum to implement regionally consistent creek monitoring approaches and designs in the Bay Area, through the improved coordination among existing Bay Area municipal stormwater monitoring programs; and, in turn stabilizing the costs of creek monitoring by reducing duplication of effort and streamlining reporting. Participation in the RMC is coordinated by stormwater program and/or Co-permittee representatives (or equivalent), and facilitated through the BASMAA Monitoring and Pollutants of Concern Committee (MPC), which meets monthly.

With notification of participation in the RMC, Co-permittees are required to commence water quality data collection by October 2011. Therefore, with the exception of monitoring described under Provision C.8.b (San

Francisco Estuary Receiving Water Monitoring), Co-permittee efforts in FY 09-10 were generally focused on the development of the RMC and associated near-term projects. To better define the scope of the RMC and its implementation over the term of the MRP, Program staff took the lead on developing a Draft RMC Work Plan (Draft RMC Work Plan), which includes over 30 RMC monitoring projects and associated project schedules. Many RMC monitoring tasks were approved by the BASMAA Board of Directors (BOD) and began in FY 09-10. Others are being considered for funding by the BOD in FY 10-11 and future fiscal years through annual planning.

Status reports for monitoring activities coordinated through the RMC are included in Section 15 – Regional Supplement for Pollutants of Concern (POCs) and Monitoring. Monitoring activities coordinated through the Program in FY 09-10 are further described in this section.

C.8.b. San Francisco Estuary Receiving Water Monitoring

In compliance with Provision C.8.b, Co-permittees are required to contribute their fair-share financially on an annual basis towards implementing an Estuary receiving water monitoring program that at a minimum is equivalent to the Regional Monitoring Program for Water Quality in the San Francisco Estuary (RMP). During FY 09-10, Co-permittees complied with this Provision by contributing a total of $178,000 to the RMP. In addition, Program and Co-permittee staff actively participated in RMP committees and work groups. Specifically, on behalf of all BASMAA member agencies, the Program Manager provides representation on the RMP Steering Committee and Program's watershed monitoring and assessment coordinator sits on the RMP's Technical Review Committee and a number of work groups and strategy teams. Additional information on the RMP, including monitoring results and conclusions, can be found on the San Francisco Estuary Institute's website (www.sfei.org/rmp/).

C.8.d. Monitoring Projects

Provision C.8.d.i requires Co-permittees (through the Program or RMC) to conduct stressor/source identification studies based on receiving water data conducted through creek status monitoring. In previous fiscal years, the Program collected status monitoring data in the mainstem of Coyote Creek. In FY 09-10, the Program began planning a monitoring project designed to better characterize water quality in the mainstem by conducting continuous water quality monitoring of pH, dissolved oxygen, conductivity, temperature and turbidity during the late summer and fall of 2010.

The monitoring project is intended to answer the following questions related to water quality in Coyote Creek, with a focus on dissolved oxygen and turbidity concentrations during the late summer season and the first runoff event of the wet weather season:

1. What is the diurnal variability in dissolved oxygen concentrations?
2. What is the spatial variability of dissolved oxygen and turbidity concentrations?
3. How does water quality change during and following the first runoff event of the season?
4. To what extent do monitoring results provide information to identify and prioritize potential stressors or sources?

The monitoring project will be implemented by the Program, the City of San Jose and the Santa Clara Valley Water District (SCVWD). The Program/agencies will collaborate together to calibrate, deploy and retrieve continuous monitoring equipment at nine locations in Coyote Creek. Monitoring equipment will

be deployed for three sampling events starting in August 2010. The last sampling event will target the first runoff event of the season. For each event, the equipment will be deployed over a roughly two-week period. Continuous monitoring equipment will be programmed to collect dissolved oxygen (DO), conductivity, pH, turbidity, and temperature at 15-minute intervals.

As part of the monitoring project plan development, Program staff developed Standard Operating Procedures (SOPs) for continuous water quality monitoring probes that will be utilized for this and future projects. Once data collection is completed, the Program will compile all water quality data and present the results in a summary report, which will likely be included in Program's FY 10-11 Annual Report.

Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI)

The increased interest in bioassessment within the Bay Area spawned the formation of the Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI) in February 2002. BAMBI is a network of scientists, watershed managers, regulators and community members interested in using biological communities (i.e., benthic macroinvertebrates or BMI) as indicators of stream health in the San Francisco Bay Area. The goal of BAMBI is to maximize the utility of aquatic bioassessment in the Bay Area by developing a programmatic and analytical framework for the collection, sharing, analysis and use of bioassessment data. Specific activities conducted by BAMBI in FY 09-10 are presented below. Additional information on BAMBI is provided at the following website: www.bayareabugs.org.

BAMBI 2010 Annual Meeting

Since 2002, Program staff has coordinated an Annual BAMBI meeting where bioassessment data and analyses can be presented from a local, regional or state perspective. On February 16, 2010, the eighth annual BAMBI meeting was held in Oakland. The agenda for the annual meeting is included within Appendix 8-1. Presentations can be found at www.bayareabugs.org.

Index of Biotic Integrity (IBI) for San Francisco Bay Area Creeks (SCVURPPP)

In collaboration with Alameda Countywide Clean Water Program and Water Board staff, Program staff began developing a Benthic Macroinvertebrate Index of Biotic Integrity (B-IBI) for creeks in the San Francisco Bay Area in FY 04-05. A B-IBI serves as an easy-to-use scorecard for determining the condition of water quality and stream habitat (i.e., stream health) using biological communities. The IBI approach is designed to maximize detection of degradation by controlling for natural variation in biological communities.

The development of a B-IBI for the Bay Area complements B-IBIs that were recently developed through a partnership between the State Water Resources Control Board (State Board) and the California Department of Fish and Game. Through that effort B-IBIs for southern and northern California coastal and Central Valley streams were developed. These B-IBIs will likely serve as the starting point for the development of biological objectives by the State Board (see summary later in this section).

To guide the development of the San Francisco Bay Area B-IBI, a Work Plan was created early in the development process (see Program's FY 04-05 Annual Report). The Work Plan has six main tasks listed in sequential order:

1. Form Technical Advisory Group;
2. Compile Existing BMI Data from Participating Agencies/Organizations;
3. Standardize Datasets and Import into Database;
4. Develop Reference Conditions;
5. Select Metrics for the IBI; and
6. Develop, Validate and Refine IBI.

Tasks 1 through 3 are complete. During FY 09-10, the Program continued to contribute substantial in-kind services towards the completion of Task 4 (Develop Reference Conditions), which is an integral step in completing the B-IBI. Reference conditions provide a way for comparing biological data from a potentially impacted site to a "least disturbed" site. They are also used to determine the degree of impact of a site. Program staff worked with Kevin Lundy, UC Berkeley PhD candidate, to conduct a GIS based land use analysis to define "least disturbed sites" that will form the pool of reference sites used to establish the B-IBI. The data from these reference sites were then evaluated to determine what factors may affect variability in BMI community assemblages. Results from these analyses suggest that flow regime (i.e., perennial versus intermittent) may be an important factor influencing natural variability.

Additional effort is needed to document flow regime for a large proportion of sites throughout the Bay Area that were sampled in previous years. In FY 10-11, Program staff plans to work with other BAMBI participants in developing and implementing a plan to characterize the flow regime for these sites. In addition, work will begin on Task 5 to conduct analyses to select, score and confirm metrics that will be used in the B-IBI for San Francisco Bay Area creeks.

Biological Objective Development for California Freshwater Creeks

In FY 09-10, the State Board initiated a process to develop biological objectives for assessing the health of creeks statewide. These objectives will supplement existing narrative and numeric chemical water quality objectives currently in place. The biological objectives will be in the form of a narrative statement that will be applied statewide, accompanied by a detailed implementation plan that, where possible, sets regionally appropriate numeric targets. Tools such as the B-IBI for San Francisco Bay Area Creeks described above will likely serve as one of the types of tools used to set and evaluate numeric target attainment.

Three oversight committees (Stakeholder, Scientific Steering and Regulatory Oversight) have been established for the development and public vetting of the regulatory and technical policy statements. Program staff was asked by the State Board staff to participate on the Stakeholder Committee, which had its first meeting on May 26, 2010. The Stakeholder Committee will continue to meet periodically during FY 10-11 and FY 11-12.

■ Regional Activities

Regional activities coordinated through the RMC in FY 09-10 are summarized in Section 15 - Regional Supplement for Pollutants of Concern and Monitoring. In combination with monitoring coordinated directly through the Program, these regional activities are intended to fully comply with Provision C.8.

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Section 9

Pesticides Toxicity Control

September 15, 2010

Section 9 Pesticides Toxicity Control

Introduction

Provision C.9 of the MRP requires Co-permittees to implement pesticide toxicity control programs that address their own and others use of pesticides within their jurisdictions that pose a threat to water quality and have a potential to enter the municipal stormwater conveyance system. Consistent with the requirements within Provision C.9, the Program's (and Co-permittees') approach to pesticide management focuses on the use of best management practices (BMPs) for source control and pollution prevention. Program BMPs for pesticide management include significant outreach efforts to residents, businesses, and municipal staff to provide education and achieve behavior changes relative to uses of pesticides and less toxic pest control methods. Outreach efforts have been supplemented by monitoring studies to define the problem; participation in regional monitoring and organizations to address pesticide regulations and other issues; and development of local pest management plans.

In FY 09-10, activities associated with Provision C.9 were conducted at the Co-permittee, Program and Regional levels. Local actions are documented in each Co-permittee's section of the annual report. This section highlights pesticide toxicity control activities conducted at the Program and/or Regional levels that are associated with the following sub-provisions of the C.9 Provision:

- Program Activities
  - Interface with County Agricultural Commissioner (C.9.f)
  - Public Outreach (C.9.h)
- Regional Activities
  - Track and Participate in Relevant Regulatory Processes (C.9.e)
  - Evaluate Implementation of Source Control Actions Relating to Pesticides (C.9.g)

These activities built upon a large body-of-knowledge gained through tasks completed in previous fiscal years.[1] Program and regional task highlights presented in this section are organized by Permit provision or by major heading (both marked in bold).

Program Activities

C.9.f. Interface with County Agricultural Commissioners

Program staff met with Kevin O'Day (Agricultural Commissioner, Santa Clara County Division of Agriculture) in April 2010 to update him on the MRP requirements for pesticide toxicity control. Program staff provided him with a Fact Sheet on the Program's pesticide control activities and updated him on the regulatory, outreach and monitoring activities implemented by the Program and Co-permittees to meet MRP requirements. Mr. O'Day provided the following feedback on the MRP requirements:

[1] Pesticide-related work products completed by the Program or through regional efforts in previous fiscal years, and associated task summaries of Program efforts can be found on the SCVURPPP website (www.scvurppp.org).

- Reporting Violations in Pesticide Use - The Division of Agriculture (DOA) receives about 20 pesticide related complaints (mostly illegal dumping) each year and has the authority to administer civil fines in response to complaints. Most complaints are received from residents. He suggested the Program publicize the DOA's phone number (408-918-4600) on the Watershed Watch website. Co-permittees should also make sure that their staff is aware of this number. The DOA website will also provide a link to the Watershed Watch website.
- Assemble and submit information (such as monitoring data) as needed to assist DPR and County Agricultural Commissioners in ensuring that pesticide applications comply with water quality standards – This requirement applies more to DPR than to the DOA.

The meeting resulted in the following action items:

- A link to the "less-toxic gardening" section of the Watershed Watch website has been posted on the DOA website.
- The pesticide violations reporting phone number has been posted on the Watershed Watch and SCVURPPP websites.
- Program staff contacted Ms. Michelle Thom (Deputy Agricultural Commissioner, County of Santa Clara) and obtained a copy of the database of pesticide violations reported to the DOA in FY 09-10. The violations were reported by private residents, employees of pesticide companies and health agencies. In a follow-up telephone conversation with Program staff, Ms. Thom said that she does not recall receiving any pesticide use complaints from municipal staff.

In future years, Program staff intends to continue interfacing with the County's Agricultural Commissioner through discussions and sharing of information.

C.9.h. Public Outreach

Point of Purchase Outreach to Consumers (C.9.h.i & ii)

The Program contributed funds to and actively participated in, the BASMAA IPM Store Partnership Program (also know as the *Our Water Our World Program*). The Program implemented the IPM Store Partnership Program in 38 stores locally. Program staff routinely visited the participating stores for restocking literature racks and updating shelf-talkers. A major success in FY 09-10 was the implementation of the program in all 10 Home Depot stores in the Program's jurisdiction.

The Program contracted with Ms. Ann Joseph for store employee training. Ms. Joseph trained approximately 99 employees representing 13 stores. She provided two hours of onsite training at 13 different stores in Santa Clara County and supplied attendees with handouts and store lists of less-toxic products. In addition, she worked with two participating stores, Summer Winds (Palo Alto) and Los Altos Garden Supply (Los Altos) to implement the "Increasing Shelf Space for Less-Toxic Products" projects. Her work included: 1) meeting with pesticide buyers at stores; and 2) motivating them to increase the store's inventory of less-toxic products. Appendix 9-1 includes the detailed Store Training Summary Report and the list of stores participating in the program in Santa Clara Valley.

Based on the Program's evaluation of effectiveness, the IPM Store Partnership Program continued to be a success in FY 09-10. The store managers and employees were enthusiastic about the program and extremely receptive to having the Our Water Our World (OWOW) display in stores. Feedback on the

trainings was also very positive, as indicated in the evaluation summary included in Appendix 9-1. Employees from Home Depot stores received the training for the first time this year. Their feedback indicates that, compared to employees from stores that have been in the program for a number of years, Home Depot employees are less aware of IPM issues. A few highlights of the evaluation are:

- 100% of Home Depot employees agreed that the training changed their attitude about pesticides; compared to 59% of employees from other stores.
- 43% Home Depot said information was new to them; compared to 33% of employees from other stores.
- 100% of Home Depot employees said that they would recommend the training to co-workers.

The Program intends to continue the local implementation of the IPM Store Partnership Program, including IPM training for store employees and the "Increasing Shelf Space for Less-Toxic Products" project.

Pest Control Contracting Outreach (C.9.h.iii)

As required by Provision C.9.h.iii., the Program conducted outreach about less-toxic pest control to residents who use or contract for structural or landscape pest control. Messages included proper use and disposal of pesticides, IPM, information about the *Green Gardener* Program, the list of trained *Green Gardeners*, and the OWOW Program. The Program conducted the following IPM outreach activities in FY 09-10 to meet this requirement:

- Media Advertising - Messages about less-toxic pest control were included within Watershed Watch advertising. Advertisements were placed in a Spanish community newspaper, local radio stations and online. Additional details on the media campaign are included in Appendix 7-1.
- Outreach at Events – Program, Co-permittee and Watershed Watch staff conducted IPM outreach at seven events. These were:
  - Pumpkins in the Park, October 10, 2009
  - Muslim Green Fair, October 18, 2009
  - Haunted History, October 31, 2009
  - Spring Garden Market, April 10, 2010
  - NVIDIA Corp. Earth Day Event, April 22, 2010
  - Spring in Guadalupe Gardens, April 24, 2010
  - Festival in the Park, June 26, 2010

Results from the media advertising and outreach events conducting in FY 09-10 by the Program yielded the following conclusions regarding the effectiveness of these activities:

- Media Advertising - The IPM outreach media campaign, which included free promotional ads, received a large number of gross impressions. Additional details are included in the FY 09-10 detailed Watershed Watch Campaign and Media Report within Appendix 7-1.
- Outreach at events - Overall, the seven outreach events were successful in providing opportunities for educating the public about less-toxic pest control methods. Event staff

distributed approximately 5,176 total IPM fact sheets, brochures and giveaways (e.g., activity books, magnets, flyswatters, notepads, etc.).

The Program also provided funding to support the Going Native Garden Tour held on April 18, 2010. There were approximately 12,447 visits to the gardens. The tour featured 67 gardens that demonstrated environmentally sensitive gardening practices with an emphasis of reduced water use, reduced chemical and pesticide use, and improved habitat using California native plants.

Outreach to Pest Control Operators (C.9.v)

In FY 07-08, the Program piloted the first Santa Clara Valley *Green Gardener* training which is an educational initiative that brings quality training to professional landscapers, gardeners and landscape maintenance workers on how to "garden green." Each training session consists of ten 2-hour classes, held once a week for ten weeks. The training is conducted in collaboration with the Metropolitan Adult Education Program (MAEP), and the Master Gardeners of Santa Clara County. The Program conducted two training sessions in FY 09-10, including one session conducted entirely in Spanish. The Program provided funds toward student fees, guest speaker fees, Spanish interpreter fees, and supplies (soil probes, magnifying lenses, and "Good Bug Bad Bug" Charts). In addition, the Program held four two-hour re-certification classes for *Green Gardeners*. The City of Sunnyvale provided staff support for coordinating and conducting the *Green Gardener* trainings, and provided space to host the re-certification classes. The West Valley Clean Water Program provided funds for mailing *Green Gardener* training announcement fliers.

A total of 22 individuals completed the *Green Gardener* training in FY 09-10 (12 took the training in English and 10 in Spanish). In addition, 30 individuals attended the re-certification classes. A summary of the evaluations from the *Green Gardener* training is included in Appendix 9-2. It indicates that attendees found the class very useful and will be making changes to their landscape management practices based on what they learned at the trainings. Attendees were required to take a final test to receive the certificate of completion. This ensured that they understood the curriculum and will be able to implement the practices at their client locations. Additional details on the FY 09-10 *Green Gardener* trainings are included in the *Green Gardener* Training report in Appendix 9-2.

Program and City of Sunnyvale staff also met with representatives from the California Landscape Contractors Association (CLCA) to update them on the Green Gardener training program. The CLCA will promote the training program to their membership.

The Program plans to continue implementing the Green Gardener training program in FY 10-11. Classes will be held at the Sunnyvale-Cupertino Adult Community Education (ACE) training center in Sunnyvale. Due to budget constraints, MAEP could no longer hold the classes at their facility in San Jose. The Program will also continue to work with the Santa Clara County Master Gardeners to receive their help in teaching the class and promoting the use of trained Green Gardeners through their hotline and other outreach venues.

■ Regional Activities

Regional activities conducted in FY 09-10 to address MRP C.9 Provisions are summarized in Section 15 (Regional Supplement for Pollutants of Concern and Monitoring). These include the status of projects to: 1) Track and Participate in Relevant Regulatory Processes (C.9.e), and 2) Evaluate Implementation of

Source Control Actions Relating to Pesticides (C.9.g). In addition, a copy of the Regional IPM Partnership (Our Water Our World) Program report is included in Appendix 9-3.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Section 10

Trash Controls

September 15, 2010

Section 10 Trash Controls

Introduction

The goal of MRP Provision C.10 (Trash Load Reduction) is to implement control measures and other actions to reduce trash loads to local urban creeks by 40% by 2014, which will set the course for additional load reductions in future years. To achieve this goal, Co-permittees are required to develop and implement a Short-Term Trash Load Reduction Plan, which includes the installation and maintenance of trash full-capture devices, designed to treat a mandatory minimum level of land area, and implementation of other control measures and best management practices (i.e., trash reduction ordinances) to prevent or remove trash loads. To address longer-term goals of trash reduction, Co-permitees are also required to develop a Long-Term Trash Load Reduction Plan near the end of the Permit term in preparation for the next Permit.

Activities associated with Provision C.10 requirements were conducted at the Co-permittee, Program and Regional levels In FY 09-10. Local actions are documented in each Co-permittee's section of the annual report. This section highlights trash reduction activities conducted at the Program and/or Regional levels, including:

- Program Activities
  - Development and Testing of Draft Trash Baseline Load Estimation Methods
  - Prioritization of Potential Trash Generation Areas
  - Characterization of Catch Basin Trash and Debris
  - Trash Hot Spot Selection and Assessment Guidance and Reporting
  - Participation in Bay Area-wide Trash Capture Demonstration Project
  - Participation in Santa Clara County Zero Litter Initiative (ZLI)
  - Trash Ad hoc Task Group Meetings
- Regional Activities
  - BASMAA Trash Committee
  - Development of Trash Load Reduction Tracking Method

These activities built upon a large body-of-knowledge gained through tasks completed in previous fiscal years.[1] Program and regional task highlights presented in this section are organized by Permit provision or by major heading (both marked in bold).

[1] Trash-related work products completed by the Program in previous fiscal years and task summaries of Program efforts can be found on the "trash" section of the SCVURPPP website (http://www.scvurppp-w2k.com/poc_wp.shtml#trash).

■ Program Activities

C.10.a. Short-Term Trash Load Reduction

Development and Testing of Draft Trash Baseline Load Estimation Methods

Provision C.10.a.ii of the Municipal Regional Permit (MRP) requires Co-permittees to determine baseline trash loads from their municipal separate storm sewer systems (MS4s) to establish the basis for trash load reductions. Co-permittees are required to submit trash load levels to the Water Board by February 1, 2012.

Using information gained through trash characterization studies conducted by the Program during this and previous fiscal years, Program staff developed and tested preliminary methods to calculate baseline trash loads from MS4s in FY 09-10. Preliminary trash loading rates were derived from data collected at trash full capture devices installed at catch basins in the Cities of San Jose (n=35) and Sunnyvale (n=12). Trash and debris were periodically removed and measured at these catch basins during 2008 and/or 2009.

Through this exercise, Program staff identified and evaluated several factors that may influence trash loading rates from MS4s. These factors included:

- Season (wet versus dry) – based on very preliminary data, average daily loading rates during the wet season (Oct. 15 – May 15) are 4 times greater than the dry season;
- Drainage Area Size – although extremely difficult and cumbersome to predict, the estimated size of the area draining to a catch basin can affect loading rates. On a unit basis, loading rates to catch basins with larger drainage areas appear to be smaller than those from smaller drainage areas;
- Land Use – as expected, land uses within catch basin drainage areas appear to partially explain differences in loading rates; and,
- Road Density and Type - road type and density in the drainage area may affect loading rates, although preliminary data suggest that land use type and road type/density are highly correlated.

Methods, results and conclusions of the study are presented in the technical report entitled *Results and Lessons Learned from Pilot Implementation of Trash Full Capture Devices* (see www.scvurppp.org). Based on lessons learned to-date, plans are already underway in FY 10-11 to continue to refine loads estimation methods. Ideally, methods would be consistently applied throughout the region.

Prioritization of Potential Trash Generation Areas

Provision C.10.a.iii of the MRP requires all population-based Permittees to install and maintain a mandatory number of full capture devices by July 1, 2014, to treat runoff from an area equivalent to 30% of Retail/Wholesale Land that drains to MS4s within their jurisdictions. During FY 09-10, Program staff developed maps based on preliminary lessons learned from the loads methods development (see above) that show priority drainage areas for potential trash generation. The maps are intended to assist Co-permittees in identifying the most ideal locations to implement trash full capture devices or other control measures, based on predicted loading rates. Two types of maps were developed, depending upon the availability of existing GIS data sources for each Co-permittee. The first type of map prioritizes

catch basins and the second identified priority storm drain catchments. A technical memorandum describing the methods used to develop the maps is included on the SCVURPPP website (www.scvurppp.org).

C.10.b. Trash Hot Spot Selection and Cleanup

Provision C.10.b of the MRP requires each Co-permittee to identify and select a required number of trash hot spots in creeks or shorelines within their jurisdictions that will be the focus of required annual trash assessments and cleanups. To assist Co-permittees in meeting this requirement, Program staff developed the necessary tools (i.e., initial trash hot spot list and guidance memorandum) used to identify and select final trash hot spots; and developed and submitted (on the Co-permittees behalf) the report entitled *Trash Hot Spot Selection: Final Report* to the Water Board on June 29, 2010. The *Final Report* includes the final trash hot spot list, information sheets detailing the final trash hot spots and maps.[2] The trash hot spot selection process and timing of hot spot cleanups and assessments is detailed below.

Trash Hot Spot Selection Assistance and Reporting

To assist Co-permittees in developing the final trash hot spot list, Program staff compiled all readily available information on trash hot spots in the Santa Clara Valley. In December 2009, Program staff held two public meetings for Co-permittees and other interested stakeholders to discuss MRP trash hot spot requirements, gain additional information on known trash hot spots and document new hot spot locations within Santa Clara Valley creeks and shorelines. During January 2010, existing and new information gained through the December meetings were compiled to form the initial hot spots list. Approximately 150 potential trash hot spots were included on the initial list. To further assist Co-permittees in identifying and selecting their final trash hot spots, Program staff developed a guidance memorandum entitled *Permit Provision C.10.b - Trash Hot Spot Selection Guidance*(dated February 5, 2010) that included: 1) a step-by-step process for selecting and assessing final trash hot spots; 2) a list of considerations when selecting final trash hot spots; 3) required information needed for Program staff to develop the Trash Hot Spot Selection: Final Report; and 4) a schedule for completion of the Final Report. In addition, the initial hot spots list was distributed with the guidance memorandum. Each Co-permittee was requested to review the initial list and use this information as the starting point for identifying final trash hot spots. In spring 2010, Co-permittees selected their final trash hot spots for inclusion in the *Final Report*.

Trash Hot Spot Cleanup and Assessment Guidance

Provision C.10.b(ii) of the MRP requires Permittees to cleanup trash hot spots to a level of "no visual impact" at least one time per year for the term of the permit (December 1, 2009 through November 30, 2014). Based on discussions with lead Water Board staff[3], trash hot spot cleanups and assessments will be conducted each calendar year (CY) during the term of the permit (i.e., 2010 through 2014). Initial annual cleanups required by the MRP will occur by the end of CY 2010. The timing of annual cleanups will vary between hot spots. Timing will likely depend on the location of the hot spot, potential for natural resource impacts, crew availability and other site-specific factors. The schedule for reporting the results of hot spot cleanups and assessments which occurred during CY 2010 and future years is

[2] See http://www.scvurppp w2k.com/pdfs/0910/Trash_Hots_Spots_Selection_Final_Report_062910.pdf) for the full report.
[3] Program staff communications with Dr. Tom Mumley, Assistant Executive Officer of the Water Board, at multiple Board of Directors meetings of the Bay Area Stormwater Management Agencies Association (BASMAA).

currently being discussed with Water Board, Co-permittee and Program staff. As a result, CY 2010 cleanup and assessment results may not be reported as part of the Co-Permittees' FY 09-10 annual report submittal, but will be reported as part of the FY 10-11 Annual Report. In addition, reporting of future assessments will occur as part of annual reporting.

Bay Area-wide Trash Capture Demonstration Project

In October 2009, the San Francisco Estuary Partnership (SFEP) was awarded a $5 million grant to fund the San Francisco Bay Area-wide Trash Capture Demonstration Project ("Project"). This grant was funded through the State Water Resources Control Board's Clean Water State Revolving Fund using federal stimulus monies (American Recovery and Reinvestment Act of 2009). The 3-year project is primarily intended to provide preliminary resources to Bay Area municipalities in purchasing a limited number of the Permit-required trash full capture treatment devices for installation into municipally owned stormwater conveyance systems. All municipalities in the eight Bay Area counties (i.e., Marin, Sonoma, Napa, Solano, Contra Costa, Alameda, Santa Clara and San Mateo) that hold an NPDES Phase I or II permit may participate in the Project. Participating municipalities have been allocated a minimum dollar amount to fund the purchasing and installation of full-capture trash capture devices.

Project Oversight/Steering

During FY 09-10, Program staff worked closely with SFEP by participating in three groups/subgroups related to the Project. A description and the status of each group are provided below.

- Trash Advisory Group (TAG) – The TAG "kicked-off" the Project in October 2009 and has had subsequent meetings to guide the Project. TAG members serve as technical resources to the Project and include Co-permittee and Program staff.
- Trash Vendor/RFP Subgroup – Program and Co-permittee staff actively participated in the Trash Vendor and RFP Subgroup that assisted with: the Request for Proposal (RFP) process to select trash device vendors; planning of the trash vendor fair held May 4, 2010; development of "Fact Sheets" content and format for each device certified as full capture; and development of a list of frequently asked questions (FAQs) for municipalities to use at the vendor fair.
- Monitoring Subgroup – Program staff participated in this subgroup that is responsible for identifying the types of data needed to document siting and maintenance issues as well as assisting in the development of a reporting mechanism. It is anticipated that SFEP will develop a web-based database to store and maintain data.

In July 2010, SFEP sent the "Agreement for Local Agency Participation in Grant-Funded Bay Area-wide Trash Capture Demonstration Project", trash device ordering documents and a list of FAQs regarding the project to the stormwater contacts of each eligible municipality within the Bay area. Co-permittees are in the process of reviewing the "Agreement" and deciding whether to participate in the Project.

During FY 10-11, Program staff will continue to assist participating municipalities in deciding which small and/or large trash control devices are best suited for their local conditions and characteristics.

Participation in SCBWMI Zero Litter Initiative

The SCBWMI Zero Litter Initiative (ZLI) is a self-organized group of agencies that are impacted by litter issues or have an interest in reducing litter in Santa Clara County. The ZLI developed as an outgrowth of the Santa Clara Basin Watershed Management Initiative's Trash Subgroup.

In FY 09-10, the ZLI made considerable progress in: 1) developing a draft resolution for participating municipalities and agencies in Santa Clara County to adopt in support of the ZLI; 2) planning and holding the second Santa Clara Basin "Trash Summit"; and 3) establishing the ZLI's relationship to existing commissions, organizations, agencies and committees. The ZLI Steering Committee, which includes Co-permittee and Program staff, met monthly during FY 09-10 and will continue to meet monthly in FY 10-11.

Trash Ad hoc Task Group Meetings

The Program's Trash Ad hoc Task Group (Trash AHTG) meet a total of four times during FY 09-10 to discuss C.10 permit requirements and future implementation strategy, draft work products and the Bay Area-wide Trash Capture Demonstration Project. In addition, members of the Trash AHTG meet twice to discuss hot spot selection and once to discuss the development of the trash load reduction tracking method. During FY 10-11, the Trash AHTG plans to meet monthly to discuss the development of the trash baseline load and load reduction tracking method development, hot spot cleanup and assessments, and other permit-related requirements.

■ Regional Activities

BASMAA Trash Committee

The BASMAA Trash Committee was formed in FY 09-10 to provide a forum to discuss trash-related activities, projects and issues that have regional applicability. Program staff (Chris Sommers) serves as the Chairperson of the Committee, which meets monthly. Committee agendas in FY 09-10 included presentations, discussions and updates on hot spot selection, assessment and reporting tools and guidance, SCVURPPPP trash baseline load estimation methods, SFEP's Bay Area-wide Trash Capture Demonstration Project, and Clean Water Action's *Taking Out the Trash* Project. In addition, one regional project (Trash Load Reduction Tracking Method) was developed and is currently under the purview of the Trash Committee (see below for description).

C.10.a.ii Trash Load Reduction Tracking Method

During FY 09-10, BASMAA agreed that the development of a trash load reduction tracking method, as required by Provision C.10.a.ii, will be a regional project with the BASMAA Trash Committee providing project oversight. The project is being conducted through in-kind contributions from SCVURPPP and the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP).

Based on the project scope of work, the project will include the development of a tracking method, including associated formulas, baseline formation and future data needs (i.e., identification of data needed to populate these formulas). In combination with the Baseline Trash Loading Estimate, the tracking method will assist MRP Permittees in demonstrating progress towards trash load reduction

goals (i.e., 40%, 70% and 100%) through quantification of the effectiveness of trash load reduction activities (i.e., BMPs and control measures).

To assist with this process, Program and Co-permittee staff from the Cities of San Jose and Cupertino identified a list of potential control measures that should be considered for loads reduction tracking methodology development. Once the list was developed, Program and Co-permittee staff conducted a literature review to evaluate quantification methods that have been used by others to assess trash control measure effectiveness or progress towards quantitative goals (e.g., TMDL allocations). Results of the literature review will be documented in Technical Memorandum scheduled for completion in fall 2010. During FY 10-11, Program and Co-permittee staff (through in-kind contributions) will assist in the development of recommended formulas to quantify load reductions for specific control measures; identify data required to populate formulas; and identify future data requirements.

Santa Clara Valley
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Section 11

Mercury and PCBs Controls

September 15, 2010

Section 11 Mercury and PCBs Controls

Introduction

Provisions C.11 and C.12 of the MRP require Co-permittees to implement control programs for mercury and Polychlorinated Biphenyls (PCBs). These pollutants are grouped into a single section of this report because many of the requirements in the two MRP Provisions are written identically, due to the similarities in the sediment-associated and legacy nature of their occurrence.

For mercury and PCBs, the Water Board has previously determined that the water quality objectives and associated beneficial uses of water bodies in the Bay Area are impacted as a result of these legacy pollutants. The Water Board adopted water quality attainment strategies called Total Maximum Daily Loads (TMDLs), which assign load reductions (through waste load allocations) to Bay Area municipal stormwater programs. Co-permittee control measures to address load reductions for mercury and PCBs are prescribed through Provisions C.11 and C.12 of the MRP.

In FY 09-10, nearly all requirements in Provisions C.11 and C.12 were addressed through regional projects coordinated through BASMAA. Summaries of all regional projects conducted in FY 09-10 are described in Section 15 – Regional Supplement for Pollutants of Concern and Monitoring of this report. Those requirements addressed directly by Co-permittees are included in Co-permittee annual reports, and those addressed through the Program are described below.

Program Activities

C.11.a. Mercury Collection and Recycling Implemented throughout the Region

Provision C.11.a requires Co-permittees to promote, facilitate, and/or participate in the collection and recycling of mercury-containing devices and equipment at the consumer level. During FY 09-10, Co-permittees continued to participate in Santa Clara County's Household Hazardous Waste (HHW) Program to meet this requirement. The HHW Program continued its retail store partnership program and partnered with approximately 48 retail stores to provide free fluorescent bulb drop-off locations for residents. The Program promoted these drop-off locations at outreach events and on the Watershed Watch website. In addition, the Program promoted mercury thermometer collection events on the Watershed Watch website and Watershed Watch social networking sites (Facebook and Twitter).

During FY 09-10, the HHW Program collected a total of 92,684 lbs[1] of fluorescent bulbs at 34 retail drop-off locations within Santa Clara County.[2] This equates to a substantial increase (52%) from FY 08-09. The reason for this increase could be the discontinuation of the HHW Program's pilot project where the retail partners were responsible for recycling the collected compact fluorescent bulbs. The goal was to transition some of the collection and recycling responsibilities to the partners. However, after some

[1] Since fluorescent light bulbs come in different sizes, quantities are reported in terms of the total pounds. A new conversion factor for fluorescent lamps is used in FY 09-10. The new conversion was established by the California Integrated Waste Management Board, now CalRecycle, in 2009, and is: 1 foot equals .125 lbs and 1 CFL equals .25lbs. Previously, the conversion used was: 1 foot equals .25lbs, and 1 CFL equals .0625lbs.

[2] Information regarding the collection of mercury containing products (e.g., fluorescent bulbs, thermostats, thermometers and other products) during FY09-10 was obtained from a memorandum *entitled Fiscal Year 2009-2010 HHW Program Update* (dated August 11, 2010). This memorandum was prepared by Wendy Fong, Household Hazardous Waste Program, County of Santa Clara.

time, many of the partners no longer wanted to participate in the pilot project because of the cost associated with recycling. Some stopped taking CFLs from residents. As a result, the pilot program ended in February 2009 and the County HHW Program now collects and recycles all universal wastes collected at the retail partners. The County HHW Program does not have plans to continue the pilot project.

In addition, the HHW Program also collected the following during FY 09-10:

- 178,602 pounds of household batteries; and,
- 580 pounds of elemental mercury (including thermostats, thermometers and other products).

Draft methods for quantifying the mercury loads reduced from urban stormwater due to control measures implemented by Co-permittees, like the HHW Program, are presented in Section 15. Once these methods are finalized, the loads of mercury reduced in urban stormwater, in comparison to those required by the Mercury TMDL, will be reported in future annual reports.

Program In-kind Contributions to Regional Projects

Regional PCB and mercury projects described in Section 15 were completed by either in-kind financial or staff support by Co-permittees and Programs, or by BASMAA-hired contractors under the direction of Programs and Co-permittees. For the following regional projects, the Program provided substantial in-kind services by developing project scopes of work and budgets, serving as the project officer, conducting the project, and developing project deliverables:

- Identification of PCBs and PCB-Containing Equipment During Industrial Inspections (C.12.a);
- Conduct Pilot Projects to Evaluate Managing PCB-Containing Materials and Wastes during Building Demolition and Renovation (e.g., Window Replacement) Activities (C.12.b);
- Monitor Stormwater Pollutant Loads and Loads Reduced (C.11/12.g); and,
- Develop Allocation Sharing Scheme with Caltrans (C.11.j).

In addition, Program staff managed and actively participated in regional tasks/projects that are included under the Clean Watersheds for a Clean Bay (CW4CB) project. The CW4CB project is a partnership of Bay Area municipalities and countywide municipal stormwater management agencies whose overarching objective is to implement priority actions called for by the San Francisco Bay PCBs and mercury TMDLs and Provisions C.11 and C.12 of the MRP. The $6.84 million CW4CB Project is funded through a combination of grant funding received by BASMAA from the USEPA ($5 million) and a $1.84 million match contributed by six Bay Area stormwater programs (including SCVURPPP).

Implementation of CW4CB addresses Co-permittee compliance with the following MRP provisions:

- C.11/12.c - Pilot Projects To Investigate and Abate Mercury/PCB Sources;
- C.11/12.d - Pilot Projects to Evaluate and Enhance Municipal Sediment Removal and Management Practices;
- C.11/12.e. - Conduct Pilot Projects to Evaluate On-Site Stormwater Treatment via Retrofit; and,
- C.11/12.i - Development of a Risk Reduction Program Implemented Throughout the Region.

■ Regional Activities

Regional activities coordinated through BASMAA in FY 09-10 are summarized in Section 15 - Regional Supplement for Pollutants of Concern and Monitoring. In combination with projects and pollutant control activities coordinated directly by Co-permittees or through the Program, these regional activities are intended to fully comply with Provisions C.11 and C.12.

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Section 12

Copper Controls

September 15, 2010

Section 12 Copper Controls

Introduction

Provision C.13 of the MRP is intended to address copper control measures identified in the Basin Plan that the Water Board has deemed necessary to support copper site specific objectives in San Francisco Bay. Requirements in the MRP are included in 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;
- C.13. c. Vehicle Brake Pads;
- C.13.d. Industrial Sources;
- C.13.e. Studies to Reduce Copper Pollutant Impact Uncertainties

In FY 09-10, activities associated with Provision C.13 were conducted at the Co-permittee, Program and regional levels. Local actions are documented in each Co-permittee's section of the annual report. This section highlights copper control activities conducted at the Program and/or regional levels. These activities built upon a large body-of-knowledge gained through tasks completed in previous fiscal years.[1] Program and regional task highlights presented in this section are organized by Permit provision or by major heading (both marked in bold).

Program Activities

C.13.c. Vehicle Brake Pads

For many years, SCVURPPP has supported (directly or through BASMAA and CASQA) the Brake Pad Partnership, a voluntary partnership of brake pad manufacturers, government agencies and environmental organizations formed in 1999 to address the impacts of copper-containing brake pad wear debris on surface waters. Information on Brake Pad Partnership efforts during FY 09-10 are described in Section 15 (Regional Supplement). In addition to tasks completed by the Brake Pad Partnership, Program and Co-permittee staff continued to track the development of SB 346 (Kehoe) – Hazardous materials: motor vehicle brake friction materials – a bill to limit the amount of copper in brake pads. Tracking legislation focused on updating Co-permittees on the bill's status and current language; and preparing each to develop letters of support for the bill, if possible. The Program sent two letters of support for the bill, on June 11 and July 22, 2010, to assemblymembers on the committees approving the legislation. The Cities of Sunnyvale and Palo Alto and the West Valley Clean Water Program also sent letters of support.

[1] Copper-related work products completed by the Program or through regional efforts in previous fiscal years, and associated task summaries of Program efforts can be found on the SCVURPPP website (www.scvurppp.org).

Copper (and other pollutant) Loads Removed via Street Sweeping

Summary of Co-Permittee Street Sweeping Results

A summary of street sweeping activities conducted by Co-permittees is provided within the table entitled *Summary of Co-permittee Street Sweeping Activities- FY 2009-2010* (see Appendix 12-1). During FY 09-10, Co-permittees swept approximately 195,288 miles of paved streets and removed approximately 79,004 yd^3 or 51,313 tons of material[2]. Approximately 28,637 yd^3 of leaf litter was removed by Co-permittees who have leaf removal programs other than routine street sweeping. In addition, approximately 198,378 tons of yard waste (which includes large amounts of leaves) was routinely collected by Co-permittees.

One way to measure street sweeping effectiveness is to determine what solids and associated pollutants are collected within street sweeping debris. A typical unit of measure is the total volume of the pollutant removed by the sweeper relative to the curb length swept (e.g., yd^3/curb mile). This unit is typically referred as the removal rate. In the case of this effectiveness evaluation, the Program uses average removal rate to show the effectiveness of Co-permittee street sweeping activities within the Program's jurisdiction. The average Co-permittee removal rate during FY 09-10 was 0.40 yd^3/curb mile (see Appendix 12-1) with a range from 0.03 yd^3/curb mile (Town of Los Altos Hills) to 0.69 yd^3/curb mile (City of Palo Alto). In comparison, the average Co-permittee removal rate during FY 08-09 was 0.42 yd^3/curb mile.

The removal rate is influenced by a number of factors including accumulation rates of pollutants, the relationship between rainfall and sweeping frequencies, particle size, pavement condition and automobile parking controls[3]. As a result, effectiveness (i.e., removal rate) may vary each year depending on a change to any one of these factors. Many studies have shown that street sweeping removes significant quantities of dirt and debris from street surfaces[4]. However, results also demonstrate that the coefficient of variation of copper values and other metals (e.g., lead and zinc) in street sweeping debris is quite high[5]. In addition, the estimated pollutant load reduction is dependent on the volume of material collected (i.e., the more material collected, the greater the pollutant removal).

To illustrate the effectiveness of street sweeping activities for pollutant removal, Program staff estimated the mean pollutant reduction for the following four metals: copper, nickel, lead and zinc. These estimates are provided within the tables entitled *Summary of Co-permittee Street Sweeping Activities and estimated Mean Pollutant Load Reduction for Copper and Nickel- FY 2009- 2010* and *Summary of Co-permittee Street Sweeping Activities and estimated Mean Pollutant Load Reduction for Lead and Zinc- FY 2009- 2010*. Both tables are provided within Appendix 12-1.

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2 To determine the total volume of material removed in tons, it is necessary to convert cubic yards to tons. It is estimated that the average density of street sweeping material is 1,299 pounds per cubic yard (0.6495 tons per cubic yard) (Source: EOA, Inc., October 1996, *Estimation of Copper Collected Through Street Sweeping Efforts*. Prepared for San Mateo Countywide Stormwater Pollution Prevention Program). A value of 51,313 tons is calculated when 79,004 cubic yards is converted over to tons (79,004 cubic yards* .6495 tons/cubic yard= 51,313 tons).

3 Woodward Clyde Consultants, December 1994. *Street Sweeping Literature Review/Storm Inlet Modification*, Prepared for Alameda County Urban Runoff Clean Water Program.

4 Sartor, J. and G. Boyd, 1972. *Water Pollution Aspects of Street Surface Contaminants*. Prepared for United States Environmental Protection Agency, Washington, DC.

5 EOA, Inc, October 1996. *Estimation of Copper Collected Through Street Sweeping Efforts: Final Report*. Prepared for San Mateo Countywide Stormwater Pollution Prevention Program.

To determine the estimated pollutant load reduction (in pounds), the volume of material collected (in cubic yards) for each Co-permittee land use type (i.e., residential, commercial and industrial) was determined. This value was then multiplied by the mean concentration of trace metal content for street sweeping samples collected in the study entitled *Chemical and Physical Characteristics of Street Sweeping Sediments in Tampa, Florida, May 1999* and converted to pounds of pollutant removed (mean concentration values and the algorithm used to calculate the pounds of pollutant removed are provided in Appendix 12-1). The estimated mean pollutant load reduction values for each land use type were then summed. Estimated pollutant load reductions for copper, nickel, lead and zinc via street sweeping in FY 09-10 are presented in Table 12-1. It is important to note that there is uncertainty with these estimates since certain assumptions were made regarding the exact volume of material collected from a particular land use type.

Table 12-1. Estimated average pollutant load reduction from street sweeping conducted by Co-permittees in FY 09-10.

Land Use Type	Estimated Mean Pollutant Load Reduction (Pounds)			
	Copper	Nickel	Lead	Zinc
Residential	1052	2078	1959	2637
Commercial	505	1000	2414	1710
Industrial	250	48	234	193
Total	**1807**	**3127**	**4607**	**4540**

It is estimated that street sweeping activities from FY 04-05 through FY 09-10 resulted in the following pollutant removals for copper, nickel, lead and zinc (see Figure 12-1). During FY 09-10, a decrease in pollutant removals was observed when compared to FY 08-09 totals. As mentioned above, this decrease is due to a decrease in the total volume of material collected (81,652 yd^3 in FY 08-09 and 79,004 yd^3 in FY 09-10).

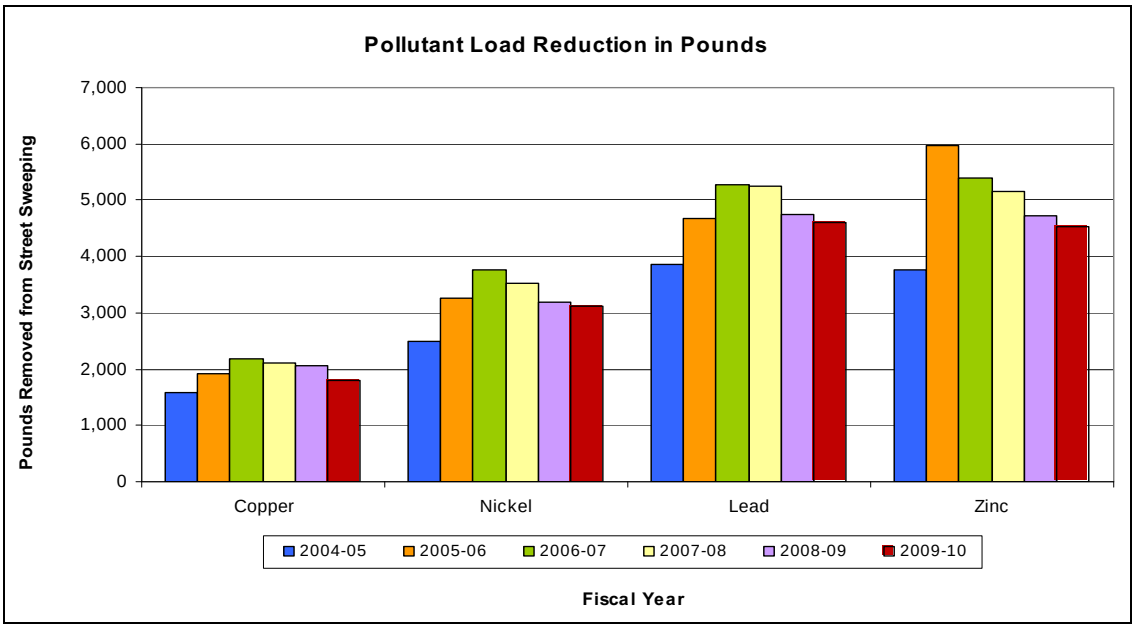

Figure 12-1. Estimated pollutant load reductions from Co-permittee street sweeping activities (in pounds) from FY 04-05 through FY 09-10.

■ Regional Activities

Regional activities conducted in FY 09-10 to address MRP C.13 Provisions are summarized in Section 15 - Regional Supplement for Pollutants of Concern and Monitoring. Summaries include the status of projects that comply with the following MRP Provisions:

- C.13.c. Vehicle Brake Pads – active engagement in legislation to reduce copper discharged from automobile brake pads to surface waters;
- C.13.d. Industrial Sources – development of educational tools to train industrial inspectors to identify facilities likely to use copper or have sources of copper and proper Best Management Practices (BMPs).
- C.13.e. Studies to Reduce Copper Pollutant Impact Uncertainties – planning of studies to investigate possible copper sediment toxicity and technical studies to investigate sub-lethal effects on salmonids.

In addition, the Program has supported CASQA efforts on the statewide level to engage in the legislative process to advance SB 346 (Kehoe). CASQA is serving as a technical resource in the bill negotiations, and significant efforts by the Executive Director and other CASQA members were expended during FY 09-10 to support and promote passage of the bill.

Santa Clara Valley
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Section 13

PBDE, Legacy Pesticides and Selenium

September 15, 2010

Section 13 PBDE, Legacy Pesticides and Selenium

Introduction

Based on the Water Board's determination, legacy organochlorine pesticides (e.g. DDT, dieldrin and chlordane), Polybromated Diphenyl Ethers (PBDEs), and selenium are either known to impair or potentially impair water quality in the San Francisco Bay. The Water Board is currently developing, or planning to develop Total Maximum Daily Loads (TMDLs) for each of these groups of pollutants.[1] Provision C.14 requires all MRP Co-permittees to work together to identify, assess, and manage controllable sources of these pollutants found in urban runoff. Therefore, all tasks associated with this Provision are regionally-coordinated and described below, or in Section 15 *(Regional Supplement for Pollutants of Concern and Monitoring)* of this report.

Regional Activities

Provision C.14 requires Co-permittees to collectively characterize the representative distribution of PBDEs, legacy pesticides, and selenium in the urban areas of the Bay Region to determine:

1. If PBDEs, legacy pesticides, and selenium are present in urban runoff;
2. If PBDEs, legacy pesticides, or selenium are distributed relatively uniformly in urban areas; and
3. Whether storm drains or other surface drainage pathways are, in themselves, sources of PBDEs, legacy pesticides, or selenium, or whether there are specific locations within urban watersheds where prior or current uses result in land sources contributing to discharges of these pollutants to San Francisco Bay via urban runoff conveyance systems.

As described in Section 15, Co-permittee and Program activities conducted in FY 09-10 to address this provision were focused on planning efforts for conducting characterizations in future years. Planning efforts included investigating the potential nexus between Provision C.14 requirements and characterization studies planned for implementation in fall 2010 by the Regional Monitoring Program for Water Quality in the Bay (RMP).

[1] Selenium in the North Bay and for PBDEs and legacy pesticides in all parts of the Bay.

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Section 14

Exempted and Conditionally Exempted Discharges

September 15, 2010

Section 14 Exempted and Conditionally Exempted Discharges

■ Introduction

Provision C.15 exempts unpolluted non-stormwater discharges from discharge prohibitions in the MRP (Provision A.1) and conditionally exempts non-stormwater discharges that are potential sources of pollutants. Per Provision C.15.b., the following categories of non-stormwater discharges are conditionally exempt from Provision A.1 if they are either identified as not being sources of pollutants or if appropriate control measures to eliminate adverse impacts are developed and implemented:

- Pumped groundwater from non-drinking water aquifers;
- Pumped groundwater, foundation drains, and water from crawl space pumps and footing drains;
- Air conditioning condensate;
- Planned, unplanned and emergency discharges of the potable water system;
- Individual residential car washing;
- Swimming pool, hot tub, spa and fountain water discharges;
- Irrigation water, landscape irrigation and lawn or garden watering.

Provision C.15.b.i.-viii. contains best management practices, monitoring and reporting requirements to allow these types of discharges to be conditionally exempt.

■ Program Activities

Potable Water System Discharges

The Water Utility Operation and Maintenance Pollution Prevention Ad Hoc Task Group (AHTG) was formed to evaluate and recommend Program strategies for meeting new requirements in Provision C.15.b.iii. for planned, unplanned and emergency discharges that apply to water utility operations. The AHTG met on March 2 and April 8, 2010. The AHTG began the task of updating the SCVURPPP *Water Utility Operation and Maintenance Discharge Model Pollution Prevention Plan* (WUDPPP) developed in June 1998. The focus of the WUDPPP update is to incorporate guidance for implementing the new, more prescriptive MRP-required BMPs, notification, monitoring and reporting requirements. A draft WUDPPP update was provided to the AHTG for review in June 2010.

Other Conditionally Exempted Discharges

Program staff reviewed Provision C.15.b. to identify any significant changes to existing Program elements that are needed to meet the requirements of C.15.b. not related to potable water discharges, and to prioritize Program work based on deadlines presented in the MRP[1]. Based on this review, there were no high priority tasks identified that needed to be addressed by the AHTG.

[1] Memorandum entitled *Recommendations for Addressing Requirements for Non-Potable Water Discharges in the MRP Provisions for Conditionally Exempted Discharges* (March 16, 2010).

Public outreach efforts that would benefit from Program-wide collaboration are being addressed in the Watershed Watch Campaign. The Watershed Watch Campaign Work Plan for FY 10-11 has incorporated elements to help the Program and Co-permittees comply with the outreach requirements of the following MRP Provisions:

- C.15.b.iv. Individual Residential Car Washing Discharge;
- C.15.b.iv. Swimming Pool, Hot Tub, Spa, and Fountain Water Discharges;
- C.15.b.vi.a. Irrigation Water, Landscape Irrigation, and Lawn or Garden Watering.

In addition, Program staff will be updating the SCVURPPP Conditionally Exempted Discharges (CED) Report (June 2000) for consistency with MRP Provision C.15 in FY10-11.

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Section 15

Regional Supplement for Pollutants of Concern and Monitoring

September 15, 2010

Section 15 Regional Supplement for Pollutants of Concern and Monitoring

This Section contains the *Regional Supplement for Pollutants of Concern and Water Quality Monitoring* (Regional Supplement) and associated appendices. It was prepared jointly by member agencies of the Bay Area Stormwater Management Agencies Association (BASMAA), on behalf of Municipal Regional Permit (MRP) Permittees and is intended to report compliance activities associated with Permit Provisions C.8 (Water Quality Monitoring), C.9 (Pesticides), C.11 (Mercury), C.12 (Polychlorinated Biphenyls), C.13 (Copper) and C.14 (Legacy Pesticides, Polybromated Diphenyl Ethers and Selenium) implemented through regional collaborative efforts.[1] Summaries of activities conducted in compliance with the following Permit Provisions are included in this Section:

- **Water Quality Monitoring (C.8)**
  - C.8.a Compliance Options
  - C.8.b San Francisco Estuary Receiving Water Monitoring
  - C.8.c Creek Status Monitoring
  - C.8.d Monitoring Projects
  - C.8.e Pollutants of Concern and Long-Term Trends Monitoring
  - C.8.f Citizen Monitoring and Participation
  - C.8.g Reporting
  - C.8.h Monitoring Protocols, Data Quality and Data Management
- **Pesticides Toxicity Control (C.9)**
  - C.9.e Track and Participate in Relevant Regulatory Processes
  - C.9.g Evaluate Implementation of Source Control Actions Relating to Pesticides
- **Joint Mercury and Polychlorinated Biphenyls (PCBs) Controls (C.11 and C.12)**
  - C.11/12.c Pilot Projects To Investigate and Abate Mercury/PCB Sources
  - C.11/12.d Pilot Projects to Evaluate and Enhance Municipal Sediment Removal and Management Practices
  - C.11/12.e - Conduct Pilot Projects to Evaluate On-Site Stormwater Treatment via Retrofit
  - C.11/12.i Development of a Risk Reduction Program Implemented throughout the Region
  - C.11/12.f Diversion of Dry Weather and First Flush Flows to POTWs
  - C.11/12.g Monitor Stormwater Pollutant Loads and Loads Reduced
- **Mercury Controls (C.11)**
  - C.11.b Monitor Methylmercury
  - C.11.h Fate and Transport Study of Mercury in Urban Runoff
  - C.11.j Develop Allocation Sharing Scheme with Caltrans
- **PCB Controls (C.12)**
  - C.12.a Identification of PCBs and PCB-Containing Equipment During Industrial Inspections
  - C.12.b Conduct Pilot Projects to Evaluate Managing PCB-Containing Materials and Wastes during Building Demolition and Renovation (e.g., Window Replacement) Activities
  - C.12.h Fate and Transport Study of PCBs in Urban Runoff

[1] Additional activities conducted independently by SCVURPPP Co-permittees or by SCVURPPP on behalf of Co-permittees are included within Sections 8, 9, 11, 12 and 13 of this Annual Report and in individual Co-permittee Annual Reports.

- **Copper Controls (C.13)**
  - C.13.c Vehicle Brake Pads
  - C.13.d. Industrial Sources
  - C.13.e Studies to Reduce Copper Pollutant Impact Uncertainties
- **PBDEs, Legacy Pesticides, and Selenium (C.14)**
  - C.14.a Control Program for PBDEs, Legacy Pesticides, and Selenium

The Regional Supplement is divided into two portions – the main body and appendices. The main body is included within this Section and provides the status of compliance activities associated with each Permit Provision listed above. Reports, technical memoranda and other related documents referenced in the main body are provided within the Appendix to Section 15. It is important to note that much of the information in Section 15 is a work-in-progress and is being submitted to illustrate the progress being made on numerous region-wide Permit Provisions.

Annual Reporting for FY 2009-2010

Regional Supplement for Pollutants of Concern and Monitoring

San Francisco Bay Area Municipal Regional Stormwater Permit

B A S M A A

Bay Area Stormwater Management Agencies Association

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A2 Clean Watersheds for a Clean Bay - Implementing the San Francisco Bay PCBs and Mercury TMDLs with a Focus on Urban Runoff. Bay Area Stormwater Management Agencies Association (BASMAA). April 19, 2010.

A3 Clean Watersheds for a Clean Bay (CW4CB) Project Status. Memorandum prepared by Kristen Kerr and Jon Konnan, EOA, Inc., for the CW4CB Project Management Team. September 13, 2010.

A4 Draft Stormwater Pump Station Diversions Feasibility Evaluation. Prepared by Brown and Caldwell, Inc. September 13, 2010

A5 Methods for Quantifying Mercury and PCB Loads Reduced From Urban Stormwater Runoff. Working Draft Technical Memorandum prepared by EOA, Inc. September 10, 2010

A6 RMP Special Study Proposal: Synthesis of Information on Mercury

A7 Coversheet of the Pollutants of Concern Stormwater Inspectors' Guidance Manual

A8 PCBs in Caulk Project, Revised Workplan, Taking Action for Clean Water: Bay Area TMDL Implementation. Prepared by the San Francisco Estuary Partnership. December 2009.

A9 Field Sampling and Chemical Analysis Plan for the PCBs in Caulk Project (Taking Action for Clean Water Bay Area TMDL Implementation). Prepared by Susan Klosterhaus, San Francisco Estuary Institute. July 2010 (draft).

A10 Quality Assurance Project Plan for the PCBs in Caulk Project (Taking Action for Clean Water Bay Area TMDL Implementation). Prepared by Susan Klosterhaus, San Francisco Estuary Institute. July 2010 (draft).

A11 RMP Special Study Proposal: Synthesis of Information on PCBs

A12 Sustainable Conservation Investor's Circle Update, Fourth Quarter 2009
A13 SB 346 as amended June 21, 2010
A14 Fact Sheet "Reducing Water Pollution Caused by Vehicle Brake Pads"
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A17 RMP Special Studies Proposal for 2011: Impact of dissolved copper on the olfactory system of seawater-phase juvenile salmon

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INTRODUCTION

This Regional Supplement has been prepared to report on regionally-implemented activities that comply with portions of the Municipal Regional Stormwater Permit (MRP), issued to 76 municipalities and special districts (Permittees) by the San Francisco Bay Regional Water Quality Control Board (Water Board). The Regional Supplement describes regionally-implemented activities conducted under the auspices of the Bay Area Stormwater Management Agencies Association (BASMAA)[1], in compliance with the following MRP provisions:

- Provision C.8 (Water Quality Monitoring); and
- Portions of Provisions C.9, C.11, C.12, C.13 and C.14, collectively referred to as "Pollutants of Concern" (POCs).

The 2010 annual reporting requirements for MRP Provisions covered in this Regional Supplement are completely met by BASMAA Regional Project activities, except where otherwise noted. Scopes, budgets and contracting or in-kind project implementation mechanisms for BASMAA Regional Projects follow BASMAA's Operational Policies and Procedures as approved by the BASMAA Board of Directors (BOD). MRP Permittees, through their program representatives on the BOD and its subcommittees, collaboratively authorize and participate in BASMAA Regional Projects or Regional Tasks. Regional Project costs are shared by either all BASMAA members or among those Phase I programs that are subject to the MRP[2][3].

This Regional Supplement does not include separate reporting products that will be required in future years by the following MRP provisions:

- C.8.g.ii Electronic Status Monitoring Data Reports;
- C.8.g.iii or v Urban Creeks Monitoring or Integrated Monitoring Reports; and
- C.8.g.iv Monitoring Project Reports.

The above Provision C.8.g reporting requirements cover most data collection activities required in C.8. While MRP C.8.g reporting is not required for the 2010 Annual Report, in Fiscal Year (FY) 2009-10 the Permittees initiated several Regional Projects for planning and development of tools needed to coordinate and support those data collection and reporting functions, described below in the section on Water Quality Monitoring.

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[1] BASMAA is a 501(c)(3) non-profit organization comprised of the municipal stormwater programs in the San Francisco Bay Area.

[2] The BASMAA programs supporting MRP Regional Projects include all MRP Permittees as well as the cities of Antioch, Brentwood, and Oakley which are not named as Permittees under the MRP but have voluntarily elected to participate in MRP-related regional activities with the expectation that regionally coordinated activities undertaken by the Contra Costa Clean Water Program and other BASMAA partners will fulfill requirements that will be established by the Central Valley Regional Water Quality Control Board through its separate NPDES permit regulating stormwater discharges from eastern Contra Costa County.

[3] Additional activities related to the Pollutants of Concern or Water Quality Monitoring provisions reported here may have been conducted during FY 2009-10 by individual Permittees or groups of Permittees acting through a joint stormwater program. Summaries of these activities contained in annual reports submitted by Permittees or programs may include information that was not required by the MRP, or activities performed for regional compliance with MRP provisions but not approved as part of a Regional Project by the time this Regional Supplement was completed.

POLLUTANTS OF CONCERN

Provisions C.9 through C.14 of the MRP address pollutants that the Water Board has identified as potentially contributing to water quality concerns for the San Francisco Bay and/or local waterbodies. These pollutants are referred to as "pollutants of concern" (POCs). For some POCs, water quality attainment strategies have been adopted such as Total Maximum Daily Loads (TMDLs).

For mercury, polychlorinated biphenyls (PCBs) and other sediment-bound pollutants, the Water Board has proposed to implement control measures through MRP using four modes or levels described in the following framework:

1. Full-scale implementation throughout the region;
2. Focused implementation in areas where benefits are most likely to accrue;
3. Pilot-testing in a few specific locations; and
4. Other: This may refer to experimental control measures, Research and Development, desktop analysis, laboratory studies, and/or literature review.

Many Regional Projects reported in this section focus on MRP provisions relating to modes 3 and 4, which require studies or pilot projects intended to reduce uncertainties about the sources, occurrence or effectiveness of control measures for POCs. Other Tasks will be implemented through participation in regional or state-wide collaborative initiatives, such as:

- The Regional Monitoring Program for Water Quality in the San Francisco Estuary (RMP), described in more detail under Provision C.8.b below; and
- Initiatives to control sources of specific pollutants (e.g., Clean Watersheds for a Clean Bay project).

PESTICIDES TOXICITY CONTROL (C.9)

C.9.e Track and Participate in Relevant Regulatory Processes

The essential requirements of this provision are to track USEPA and DPR actions related to urban-use pesticides and actively participate in the shaping of regulatory efforts underway. This provision allows for cooperation among Permittees through the California Stormwater Quality Association (CASQA), BASMAA and/or the Urban Pesticide Pollution Prevention Project (UP3 Project). Recognizing that this approach is the most likely to result in meaningful changes in the regulatory environment, Permittees elected to take this route to achieve compliance with this provision. A project profile was developed by the BASMAA Monitoring and POCs Committee (MPC) to fund the reporting element of this task and the BASMAA Board of Directors (BOD) subsequently approved this Regional Project in May 2010.

The actual work of tracking and participating in the ongoing regulatory efforts related to pesticides was accomplished through BASMAA member participation in the UP3, as well the chairpersonship of the CASQA Pesticides Subcommittee. Permittees have been working with the UP3 project as well as the CASQA Pesticides Subcommittee for a number of years, so there was no lag time associated with compliance as the committee structures and membership were already fully engaged before the MRP was adopted. As a result, FY 2009-10 was very productive. Details of the specific achievements of this year can be found in the attached report, "Pesticide Regulation for Water Quality Protection, Annual BASMAA Participation Summary and Outcomes Assessment, 2010" prepared by TDC Environmental, LLC. (Appendix A1)

C.9.g Evaluate Implementation of Source Control Actions Relating to Pesticides

There are no Annual Reporting requirements for Provision C.9.g in 2010. In future years, additional information will be provided on the status of implementation activities designed to comply with this provision.

JOINT MERCURY AND POLYCHLORINATED BIPHENYLS (PCBS) CONTROLS (C.11 AND C.12)

Provisions C.11.c through Provision C.11.g for mercury are essentially identical to Provisions C.12.c through C.12.g for PCBs. This reflects similarities between the respective TMDLs for these pollutants, based on the legacy and sediment-associated nature of their occurrence. For Provisions C.11/12.c through C.11/12.f, MRP requirements focus on pilot studies; sites for these pilots will primarily be chosen on the basis of the potential for reducing PCB loads, but consideration will be given to mercury removal in the final design and implementation of the studies. Provisions C.11.i and C.12.i are also written identically, since fish consumption is a primary concern for both mercury and PCBs.

Clean Watersheds for a Clean Bay (CW4CB) is a new project funded by a grant to BASMAA from the US Environmental Protection Agency (USEPA). Implementation of the CW4CB project will result in Permittee compliance with the following MRP provisions:

- C.11/12.c - Pilot Projects To Investigate and Abate Mercury/PCB Sources;
- C.11/12.d - Pilot Projects to Evaluate and Enhance Municipal Sediment Removal and Management Practices;
- C.11/12.e. - Conduct Pilot Projects to Evaluate On-Site Stormwater Treatment via Retrofit; and
- C.11/12.i - Development of a Risk Reduction Program Implemented Throughout the Region.

The project is a partnership of Bay Area municipalities and countywide municipal stormwater management agencies. The CW4CB's overarching objective is to

implement priority actions called for by the San Francisco Bay PCBs and mercury Total Maximum Daily Load (TMDL) water quality restoration programs[4] including developing and pilot-testing a variety of methods to potentially reduce urban runoff loading of PCBs and mercury to the Bay. BASMAA will receive $5.0 million in funding from the USEPA's San Francisco Bay Area Water Quality Improvement Fund towards the $6.84 million total project cost. The remaining $1.84 million (about 27% of the total project cost) will be contributed by BASMAA and six of the Bay Area countywide stormwater management programs as a match to the funding received from the USEPA. In addition, in-kind assistance from participating Permittee staff will provide additional resources to leverage the project effort. Appendix A2 contains the CW4CB project work plan, which was approved by the USEPA on July 1, 2010.

The CW4CB project management team consisting of BASMAA's Executive Director and representatives from several BASMAA agencies and participating Permittees provides project oversight and coordination. The team meets monthly on second Wednesday of each month to discuss the status of the project, implementation of tasks, and coordination among project participants.

Appendix A3 is a memorandum describing the CW4CB project's current status. It should be noted that the project started significantly later than originally anticipated. USEPA's original Request for Proposal included an anticipated award date of February 2010. However, despite USEPA's and BASMAA's best efforts to expedite the process, USEPA was not able to provide BASMAA with an assistance agreement until June 2010 which resulted in a project start date of July 1, 2010. Thus project implementation is currently at a very early stage.

C.11/12.c Pilot Projects To Investigate and Abate Mercury/PCB Sources

Provisions C.11/12.c. require that Permittees work collaboratively to identify five Bay Area watershed areas that contain high levels of mercury and/or PCBs and conduct pilot projects to investigate and abate these high mercury and/or PCB concentrations. The CW4CB has developed proposed criteria to inform selection of the five watershed areas and is currently performing a comprehensive review of existing data relevant to the selection. Most of these data were originally compiled and made available by the Regional Stormwater Monitoring and Urban BMP Evaluation Project conducted by the San Francisco Estuary Institute (SFEI). The SFEI study investigated options for better managing mercury and PCBs in urban stormwater and was conducted in collaboration with BASMAA and the Water Board. It was funded through a grant from the State of California Proposition 13 stormwater non-point-source program. The SFEI recently completed the study and is currently updating a web site that will make the project data and results readily available. The memorandum in Appendix A3 provides additional details about the watershed selection process and status.

[4]The MRP implements those TMDL actions related to stormwater runoff.

C.11/12.d Pilot Projects to Evaluate and Enhance Municipal Sediment Removal and Management Practices

Provisions C.11/12.d of the MRP require that Permittees work collaboratively to develop and pilot-test methods to enhance removal of sediment with PCBs and mercury, mainly during existing municipal street and storm drain system operation and maintenance activities. Permittees are required to conduct this pilot work in the five pilot watersheds selected for Provisions C.11/12.c. The evaluation will include typical routine municipal operation and maintenance practices such as street sweeping, catch basin cleaning, and stormwater conveyance system cleaning, and will also include consideration of street flushing with routing of wash water to a sanitary sewer. Evaluation of existing information on high-efficiency street sweepers is also a specific C.11/12.d requirement. Permittees are required to submit a progress report on the results of these two evaluations in this 2010 Annual Report and the final evaluation results in the 2011 Annual Report. As described in the memorandum in Appendix A3, BASMAA agencies have initiated a comprehensive review of existing literature and other information relevant to the evaluations.

C.11/12.e - Conduct Pilot Projects to Evaluate On-Site Stormwater Treatment via Retrofit

Provisions C.11/12.e require that Permittees retrofit PCB and mercury treatment systems into existing storm drainage infrastructure at ten locations throughout the Permittees' jurisdictions and evaluate effectiveness. It is anticipated that some but not all of the retrofits will be sited within the five pilot watersheds identified through Provisions C.11/12.c. Permittees are required to install at least one retrofit in each of five major Bay Area counties covered by the MRP (Santa Clara, San Mateo, Alameda, Contra Costa, and Solano) and report on candidate locations with types of treatment retrofit for each location in the September 2011 Annual Report. This effort is at an early stage and has consisted to-date of initial conceptual discussions at project management team meetings. The project management team is also working with USEPA to better define procurement rules related to retention of consultants to assist with the project. The initial project need is to obtain a consultant to perform an initial conceptual screening of treatment retrofits potentially applicable to this project.

C.11/12.i Development of a Risk Reduction Program Implemented throughout the Region

Provisions C.11/12.i require that Permittees implement a regional program of risk communication activities to raise public awareness of fish contamination issues in San Francisco Bay and to encourage fish-consuming populations to reduce their exposure to pollutants in contaminated fish. These provisions require that Permittees submit in this 2010 Annual Report the specific manner in which these risk reduction activities will be accomplished and the associated schedule for their implementation. Task 6 of the CW4CB project work plan in Appendix A2 includes a description of the tasks that will be conducted via the project to raise public awareness and encourage reduction of exposure. Table 3 of the CW4CB project work plan includes the Task 6 schedule.

C.11/12.f Diversion of Dry Weather and First Flush Flows to POTWs

Provisions C.11.f and C.12.f are nearly identical provisions for control of mercury (C.11) and PCBs (C.12) requiring the evaluation of diversion of dry weather urban runoff and first flush events into publicly owned treatment works (POTWs). The first product required under these provisions is a feasibility evaluation to be included in the 2010 Annual Report. The feasibility evaluation is to include, but is not limited to, costs, benefits, and impacts on the stormwater and wastewater agencies and the receiving waters relevant to the diversion and treatment of the dry weather and first flush flows.
The report entitled "Stormwater Pump Station Diversions Feasibility Evaluation (AppendixA4) summarizes the feasibility evaluation including:

- Proposed selection criteria to inform the identification of five candidate and five alternate pump stations;
- Draft proposed time schedules for conducting pilot studies; and
- A draft proposed method for distributing mercury and PCBs load reductions to participating wastewater and stormwater agencies.

To comply with provisions C.11.f and C.12.f, BASMAA chose to approach this project as a Regional Project and a number of steps were taken to carry it out in FY 2009-10. A detailed scope of work was developed in the January – April 2010 time frame and the firm of Brown and Caldwell was retained to perform the work. Brown and Caldwell's work was directed and overseen by a Technical Oversight Committee (TOC) made up of BASMAA participants that recently began meeting on the afternoon of the second Wednesday of each month. This first TOC meeting was held July 14, 2010 during which a draft technical memorandum was reviewed that presented selection criteria for pump station projects. Data gathered to date were also reviewed by the TOC and direction was provided for completion of the feasibility evaluation report.

Following completion of the feasibility evaluation report, the oversight committee will identify how best to support programs and / or individual Permittees in using the report to scope out candidate pilot projects that are required to be completed during this permit term, for reporting in the 2014 Integrated Monitoring Report.

C.11/12.g Monitor Stormwater Pollutant Loads and Loads Reduced

Provisions C.11.g and C.12.g require Permittees to develop and implement a monitoring program to quantify mercury and PCB loads and loads reduced through source control, treatment and other management measures implemented by Permittees. Average annual mercury (160 kg/yr) and PCB (20 kg/yr) loads to the San Francisco Bay from urban (and non-urban) runoff discharges have been calculated by the Water Board through the development of Total Maximum Daily Loads (TMDLs) for these pollutants. Over the next five years, refinement of PCB and mercury loading estimates will occur through the implementation of POC Monitoring required by Provision C.8.e, and associated technical studies coordinated through the BASMAA Regional Monitoring Coalition (see Water Quality Monitoring Section) and the Regional Monitoring Program for Water Quality in the San Francisco Estuary (RMP). These loading

estimates provide a baseline to which compliance with TMDL Waste Load Allocations (WLAs) issued to Bay Area stormwater agencies can be determined.

Through a BASMAA Regional Project in FY 2009-10, preliminary draft methods to assess Permittee progress towards TMDL milestones and attainment of WLAs began to be developed. This project is intended to assist Permittees in calculating PCB and mercury loads reduced through stormwater management measures. The regional project entails the review of existing information on loads reduced methodologies developed through other recent efforts (e.g., SFEI Proposition 13 Urban Runoff BMP Project) and development of draft loads reduced formulas for specific stormwater management measures.

A Working Draft Technical Memorandum is provided in Appendix A5 that describes preliminary loads reduced methodologies for PCBs and mercury. This Technical Memorandum is a work-in-progress that requires additional feedback and revisions based upon Permittee review. During FY 2010-11, the Draft Technical Memorandum will be further developed and presented to Water Board staff for discussion and input. After further revisions, a Final Technical Memorandum will be developed and made available to Permittees to use as a tool to account for pollutant reductions that are attributable to specific stormwater management measures implemented by Permittees, and assess progress towards PCB and Mercury TMDL WLAs.

MERCURY CONTROLS (C.11)

This section describes regional activities designed to comply with specific requirements in MRP Provision C.11 that are not connected to parallel PCB provisions in C.12.

C.11.b Monitor Methylmercury

MRP Provision C.11.b duplicates the requirement in Provision C.8.g - to report results of methyl mercury monitoring required in Provision C.8.e. Per the schedule for commencement of monitoring described in the Water Quality Monitoring section of this report below, there is no data collection to report for FY 2009-10.

C.11.h Fate and Transport Study of Mercury in Urban Runoff

This MRP provision requires Permittees to conduct, or cause to be conducted, studies aimed at better understanding the fate, transport, and biological uptake of mercury discharged in urban runoff to San Francisco Bay and tidal areas. The 2010 annual reporting requirement includes a work plan describing the specific manner in which these information needs will be accomplished and describing the studies to be performed with a schedule.

This requirement is met through the RMP, which has approved a Mercury Synthesis project in 2011 (Appendix A6). The RMP Master Planning process incorporates several

Strategies to address pollutant-specific information needs and support management decisions through investigation of prioritized Management Questions. The RMP Mercury Strategy previously funded a multi-year suite of special studies being completed in 2010. The synthesis will combine results and noteworthy findings from recent Status and Trends monitoring to set the stage for a new multi-year plan for RMP studies in 2012 and beyond. Ongoing or projected future RMP efforts for the Mercury Strategy also include:

- Monitoring of mercury, PCBs and other pollutants in biota, both ongoing (Status & Trends) and in a special 3-year study of Small Fish living along the Bay margins that are an important link in the Bay food web (funded 2008-2010); and
- Development of conceptual models of transport and food web uptake for mercury and PCBs, and Bay Margin areas that will be incorporated with a planned water-sediment-contaminant model linking small tributary inputs to Bay processes.

In FY 2010-11, BASMAA representatives will continue participating in RMP Work Groups and committees to ensure future implementation of studies that meet the MRP's stated information needs, which include understanding the in-Bay transport of mercury discharged in urban runoff, the influence of urban runoff on the patterns of food web mercury accumulation, and the identification of drainages where urban runoff mercury is particularly important in food web accumulation.

C.11.j Develop Allocation Sharing Scheme with Caltrans

Wasteload allocations (WLAs) assigned to urban stormwater dischargers through the San Francisco Bay Mercury TMDL implicitly include California Department of Transportation (Caltrans) roadway and non-roadway facilities within the geographic boundaries of MRP Permittees. Provision C.11.j, requires Permittees to develop an equitable mercury allocation-sharing scheme in consultation with Caltrans to address the Caltrans facilities in the program area, and report the details to the Water Board.

In an effort to begin the development of an equitable mercury allocation-sharing scheme in FY 2009-10, the BASMAA regional technical lead for the mercury TMDL (on behalf of all Permittees) contacted lead Water Board and CalTrans staff to set a course for working collaboratively on this project. Based on these discussions, technical staff representing Permittees and CalTrans will meet in FY 10-11 to assess agency perspectives, potential methods for sharing allocations, and future collaborative efforts to reduce mercury impairment in San Francisco Bay. Additional information on the progress of collaboratively developing an allocation-sharing scheme between Permittees and CalTrans will be provided in the 2011 and subsequent Annual Reports.

PCB CONTROLS (C.12)

This section describes regional activities designed to comply with specific requirements in MRP Provision C.12 that are not connected to parallel mercury provisions in C.11.

C.12.a Identification of PCBs and PCB-Containing Equipment During Industrial Inspections

Provision C.12.a requires Permittees to develop training materials and train municipal industrial facility inspectors to identify, in the course of their existing inspections, PCBs or PCB-containing equipment. Additionally, Permittees are required to incorporate such PCB identification into existing industrial inspection programs. To assist Permittees in complying with this provision, the BASMAA Board of Directors (BOD) agreed to fund a regional project in FY 2009-10 to develop training material for stormwater inspectors. The scope of the project was to develop regional training and reporting materials to assist commercial/industrial facility stormwater inspectors in identifying PCBs, copper and mercury during their inspections, and provide inspectors with useful Best Management Practices (BMPs) and information materials for distribution to facility owners/operators. The draft training materials were completed in late FY 2009-10 and included a guidance manual for stormwater inspectors (see Appendix A7), inspection form templates, power point training presentation and example BMP materials. Results of training conducted by Permittees in FY 2009-10 are included in Permittee-specific Annual Reports.

C.12.b Conduct Pilot Projects to Evaluate Managing PCB-Containing Materials and Wastes during Building Demolition and Renovation (e.g., Window Replacement) Activities

Provision C.12.b requires that Permittees conduct pilot projects to evaluate managing PCB-containing materials and wastes during building demolition and renovation, including some activities that may not require permitting (e.g., replacement of window panes). Permittees are complying with Provision C.12.b via BASMAA's proactive participation in a project entitled "PCBs in Caulk." The project is administered by the San Francisco Estuary Partnership.[5] The project partners include BASMAA, the San Francisco Estuary Institute (SFEI), and a variety of consultants. Project funding was originally provided through a state Proposition 50 Coastal Nonpoint Source Pollution grant but was replaced by federal stimulus funds (American Recovery and Reinvestment Act of 2009 through the Clean Water State Revolving Fund). Consistent with the requirements of Provision C.12.b, the PCBs in Caulk project will:

- Evaluate PCB levels in caulk from at least 10 Bay Area sites to better understand which types/ages of buildings are most likely to have caulks with PCBs, so that management actions can be targeted effectively. Surveys previously conducted in Europe and other parts of North America have found sealants

[5]The San Francisco Estuary Partnership is a project of the Association of Bay Area Governments.

containing PCBs, sometimes in very high concentrations, in a large proportion of older buildings, particularly those built or renovated in the 1950's, 1960's and 1970's.

- Develop Best Management Practices (BMPs) and associated model policies or ordinances to prevent the release of PCBs from caulks into urban runoff during renovation, maintenance and demolition of Bay Area buildings. The project will build on work that was performed elsewhere and develop methods to identify, handle, contain, transport, and properly dispose of PCB-containing caulks.

- Test and evaluate the effectiveness of the proposed BMPs at three to five sites in the Bay Area and document which methods work best in our region and other lessons learned.

The long-term goal is for Bay Area municipalities to adopt policies or ordinances requiring construction sites to implement the management practices developed by this project, so that legacy caulks containing PCBs are prevented from polluting urban runoff and the Bay.

Appendix A8 contains the project work plan. BASMAA has approved a Regional Project that allows staff from member stormwater programs to dedicate time on behalf of all Permittees to working with the partnership's project team on implementing the project. The stormwater program staff report to and receive feedback and guidance from the BASMAA Monitoring and POCs Committee. The staff have fully participated in all facets of the project, including frequent project teleconferences, development of project work plans, review and commenting on all project deliverables (e.g., the Sampling and Analysis Plan described below), selection of a contractor to develop BMPs, a stakeholder meeting held July 15, 2010, and a public meeting held by EPA on July 22, 2010 on a proposed rulemaking related to relevant PCBs regulations.

Provision C.12.b's requirements include development of a Sampling and Analysis Plan (SAP) to evaluate PCBs at construction sites (including research on when, where, and which materials potentially contained PCBs). Submittal of the SAP is required in this 2010 Annual Report and Appendix A9 contains the SAP. It should be noted that the project has also prepared a Quality Assurance Project Plan (Appendix A10).

Provision C.12.b also requires that this 2010 Annual Report include a status report on the sampling and analysis along with whatever sampling results are available. The sampling and analysis has not yet commenced. Early in 2010 BASMAA representatives began attempting to obtain permission to access municipal properties to perform sampling and analysis and BMP implementation trials. This effort included contacting all Permittees through BASMAA e-mail distribution lists and speaking directly to individual representatives from a number of municipalities. In all cases the BASMAA representatives were informed that municipalities could not further consider providing access to their buildings and projects until they are provided with additional information, including the exact field methods that will be applied and the potential

consequences to municipal agencies that agree to participate in the field investigation. One particular concern is that EPA currently requires preparation of a cleanup plan and implementation of that plan if PCBs are found at a level exceeding 50 ppm in building materials such as caulks and sealants. The project is therefore preparing during the fall of 2010 a memorandum that will articulate the study methods and available information about potential consequences, including estimated costing information related to cleanup and proper disposal of PCB-laden materials. The sampling and analysis and BMP implementation trials are currently scheduled to commence in parallel near the end of calendar year 2010.

C.12.h Fate and Transport Study of PCBs in Urban Runoff

This MRP provision requires Permittees to conduct, or cause to be conducted, studies aimed at better understanding the fate, transport, and biological uptake of PCBs discharged in urban runoff. The 2010 reporting requirement includes a work plan describing the specific manner in which these information needs will be accomplished and describing the studies to be performed with a schedule. This requirement is met through participation in the RMP, which has approved a PCBs Synthesis project in 2011 (Appendix A11). The RMP Master Planning process incorporates several Strategies to address pollutant-specific information needs and support management decisions through investigation of prioritized Management Questions. The synthesis will combine noteworthy findings from recent Status and Trends monitoring and special studies to set the stage for a new multi-year plan for RMP studies in 2012 and beyond. Ongoing or projected future RMP efforts for the PCBs Strategy also include:

- Monitoring of mercury, PCBs and other pollutants in biota, both ongoing (Status & Trends) and in a special 3-year study of Small Fish living along the Bay margins that are an important link in the Bay food web (funded 2008-2010); and
- Development of conceptual models of transport and food web uptake for mercury and PCBs, and Bay Margin areas that will be incorporated with a planned water-sediment-contaminant model linking small tributary inputs to Bay processes.

BASMAA representatives will continue participating in RMP work groups and committees to ensure future implementation of studies that meet the MRP's stated information needs, which include understanding the in-Bay transport of PCBs discharged in urban runoff, the influence of urban runoff on the patterns of food web PCBs accumulation, and the identification of drainages where urban runoff PCBs are particularly important in food web accumulation.

COPPER CONTROLS (C.13)

C.13.c Vehicle Brake Pads

The MRP requires that Permittees report on legislation development and implementation status in Annual Reports during the permit term. Compliance is being

achieved through continued participation in the Brake Pad Partnership (BPP) process to develop California legislation phasing out copper from certain automobile brake pads sold in California.

Appendix A12, an "Investor's Circle Update" from Sustainable Conservation, provides a primer on the issue of copper from brake pad wear, the Brake Pad Partnership (BPP), and the control measure determined through the BPP to be the most appropriate for reducing copper emissions from brake pads: proposed legislation SB 346 (Kehoe) – Hazardous materials: motor vehicle brake friction materials. As described in the Update, SB 346 was introduced to the California legislature in early 2009 and, after passing out of the Senate and moving to the Assembly, was made a two-year bill in late June 2009.

In FY 2009-10, Permittees' efforts focused on:

1. Researching and providing information to assist with bill language;
2. Helping the bill's sponsors to further develop the bill language to address concerns raised by industry representatives from the auto and brake pad manufacturers, brake pad wholesalers and retailers, and car dealers; and
3. Advocating for passage of the bill by the Assembly Environmental Safety and Toxic Materials (Toxics) Committee.

The above activities were coordinated through the California Stormwater Quality Association (CASQA) BPP Team, a group of stormwater quality agencies affected by copper or metals listings, TMDLs, or permit requirements. Permittees participated in the process through BASMAA representation on the BPP team and supported SB346 with letters and lobbying efforts.

The language of SB 346 as of the end of FY 2009-10, two fact sheets on the bill, and BASMAA's letter of strong support for SB 346 to the Assembly Toxics Committee are provided in Appendices A13, A14, A15 and A16, respectively.

C.13.d. Industrial Sources

Provision C.13.d requires Permittees to identify facilities likely to use copper or have sources of copper (e.g., plating facilities, metal finishers, auto dismantlers) and include them in their inspection program plans. Additionally, Permittees are required to educate industrial inspectors on industrial facilities likely to use copper or have sources of copper and proper Best Management Practices (BMPs).

As part of the regional project described under Provision C.12.a, BASMAA developed training materials in FY 2009-10 to assist Permittees in complying with Provision C.13.d. Specifically, draft training materials were for developed to assist Permittees in training commercial/industrial facility stormwater inspectors to identify PCBs, copper and mercury during their inspections, and provide inspectors with useful BMPs and information materials for distribution to facility owners/operators. Results of training

conducted by Permittees in FY 2009-10 are included in Permittee-specific Annual Reports.

C.13.e Studies to Reduce Copper Pollutant Impact Uncertainties

This MRP provision requires Permittees to conduct, or cause to be conducted, technical studies to investigate possible copper sediment toxicity and technical studies to investigate sub-lethal effects on salmonids. These uncertainties regarding copper effects in the Bay are described in the amended Basin Plan's implementation program for copper site-specific objectives.

The MRP reporting requirement for 2010 includes description of the specific manner in which these information needs will be accomplished and of the studies to be performed with a schedule. The information needs will be filled by RMP studies coordinated through the Exposure Effect Work Group (EEWG). The RMP Master Plan (currently under development) lists EEWG priorities for the next 5 years, including effects on benthos and fish. EEWG efforts on benthos in 2011 will focus on completion of studies from prior years that include development of methods and tools for identifying the causes of sediment toxicity, followed by development of long-term plans for 2012 and beyond.

Copper impacts to the olfactory system of salmonids have been found in freshwater experiments, where short-term exposure to increased copper reduced response to alarm odors, and affected predator-avoidance behavior of young coho salmon. A special study approved for 2011 (Appendix A17) will use similar experimental methods on young Chinook salmon in saltwater.

BASMAA representatives will continue participation in the EEWG and the Benthos work groups as needed to ensure that the developing work plans include appropriate follow-up studies in these two areas.

PBDES, LEGACY PESTICIDES, AND SELENIUM (C.14)

C.14.a Control Program for PBDEs, Legacy Pesticides, and Selenium.

This MRP provision requires the Permittees to work with the other municipal stormwater management agencies in the Bay Region to identify, assess, and manage controllable sources of polybrominated diphenyl ethers (PBDEs), legacy pesticides, and selenium found in urban runoff. The reporting requirement for 2010 is to describe progress towards the following MRP implementation objectives:

C.14.a.ii. Implementation Level – The PBDEs/Legacy Pesticides/Selenium Plan shall include actions to do the following:
Characterize the representative distribution of PBDEs, legacy pesticides, and selenium in the urban areas of the Bay Region covered by this permit to determine:

(1) If PBDEs, legacy pesticides, and selenium are present in urban runoff;
(2) If PBDEs, legacy pesticides, or selenium are distributed relatively uniformly in urban areas; and
(3) Whether storm drains or other surface drainage pathways are sources of PBDEs, legacy pesticides, or selenium in themselves, or whether there are specific locations within urban watersheds where prior or current uses result in land sources contributing to discharges of PBDEs, legacy pesticides, or selenium to San Francisco Bay via urban runoff conveyance systems.

The 2012 Annual Report will provide the results of the above characterization and information necessary to calculate loads of these pollutants in stormwater. The 2013 Annual Report will Identify control measures and/or management practices to eliminate or reduce discharges of these pollutants from urban runoff conveyance systems.

Legacy organochlorine (OC) pesticides (e.g. DDT, dieldrin and chlordane), PBDEs, and selenium are either known to impair or potentially impair Bay and tributary beneficial uses. The Water Board is planning or developing TMDLs for each of these groups of pollutants: Selenium in the North Bay and for all parts of the Bay for PBDES and legacy OC pesticides.

The Permittees will address this provision through a BASMAA Regional Project that will compile existing monitoring data from multiple sources including:

- Reconnaissance characterization and Pollutant of Concern Loads Monitoring as described for Provision C.8.e under Water Quality Monitoring below.
- Local tributary monitoring by the RMP, including Coyote Creek and Guadalupe River, and more recent data on PBDEs and OC pesticides at Zone 4 Line A in Hayward; some samples were also analyzed for selenium in winter 2010.
- Previous BASMAA agency sampling for OC pesticides in storm drain sediments conducted through the Joint Stormwater Agency Project.

In FY 2009-10 BASMAA representatives participated in the RMP's Sources Pathways and Loadings Work Group and Small Tributaries Loading Strategy (STLS) Team to guide RMP sampling and to design future stormwater sampling for both the RMP and MRP Permittees under Provision C.8.e.

WATER QUALITY MONITORING

Provision C.8 of the MRP requires Permittees to conduct water quality monitoring and associated projects during the permit term. All water quality monitoring activities required by Provision C.8 are coordinated regionally through the BASMAA Regional Monitoring Coalition (RMC). Scopes and budgets for specific RMC monitoring projects are proposed for BASMAA Board of Directors (BOD) approval by the BASMAA Monitoring and Pollutants of Concern Committee (MPC). Many were approved as Regional Projects by the BOD during FY 2009-10. Others are planned to begin in FY 2010-11 or subsequent fiscal years based on schedules outlined in the MRP.

This portion of the Regional Supplement provides a status report on water quality monitoring activities/projects coordinated through the RMC in FY 2009-10 and briefly describes RMC projects planned to occur in future fiscal years. Activities described herein were conducted on behalf of all RMC participants, and in full compliance with Provision C.8 of the MRP. Summaries of the following C.8 sub-provisions are included in this section:

- Compliance Options (C.8.a)
- San Francisco Estuary Receiving Water Monitoring (C.8.b)
- Creek Status Monitoring (C.8.c)
- Monitoring Projects (C.8.d)
- Pollutants of Concern and Long-Term Trends Monitoring (C.8.e)
- Citizen Monitoring and Participation (C.8.f)
- Reporting (C.8.g)
- Monitoring Protocols and Data Quality (C.8.h)

C.8.a Compliance Options

Provision C.8.a (Compliance Options) of the MRP allows Permittees to address monitoring requirements through a "regional collaborative effort" (e.g., RMC), its' Stormwater Program, and/or individually. The regional collaborative effort option is only available if a majority of MRP Permittees agree to participate. If the regional monitoring collaborative option is selected, participants must formally notify to the Water Board in writing by July 1, 2010 and their water quality data collection required by Provision C.8 must commence by October 2011. If the stormwater program or Permittee option is selected, monitoring efforts are required to commence by October 2010. This one-year extension for the regional collaboration option is due to the time and resources needed to develop a regional monitoring collaborative.

In June 2010, Permittees notified the Water Board in writing of their agreement to participate in a regional monitoring collaborative to address requirements in Provision C.8[6]. The regional monitoring collaborative is referred to as the BASMAA Regional

[6] The Cities of Antioch, Brentwood and Oakley, although not named as Permittees under the MRP, have voluntarily elected to participate in the RMC.

Monitoring Coalition (RMC). With notification of participation in the RMC, participating Permittees are required to commence water quality data collection by October 2011. Therefore, with the exception of monitoring described in this section under Provision C.8.b (SF Bay Receiving Water Monitoring), Permittee efforts in FY 2009-10 described in this section were generally focused on the development of the RMC and associated near-term projects.

BASMAA Regional Monitoring Coalition (RMC)

The RMC is a collaboration of San Francisco Bay Area stormwater programs and associated Permittees focused on effectively and efficiently developing and implementing a regionally coordinated water quality monitoring program that will improve stormwater management in the region. The goals of the RMC are to:

- Assist Permittees in complying with requirements in MRP Provision C.8 (Water Quality Monitoring);
- Develop and implement regionally consistent creek monitoring approaches and designs in the Bay Area, through the improved coordination among RMC participants and other agencies (e.g., Water Board) that share common goals; and
- Stabilize the costs of creek monitoring by reducing duplication of effort and streamlining reporting.

Through its implementation, the RMC allows Permittees and the Water Board to effectively modify their existing creek monitoring programs, which improves their ability to collectively answer core management questions in a cost effective and scientifically rigorous way. Participation in the RMC is coordinated by stormwater program and or Permittee representatives (or equivalent), and facilitated through the BASMAA Monitoring and Pollutants of Concern Committee (MPC), which meets monthly.

To guide implementation of the RMC over the term of the MRP, stormwater program representatives developed a Draft RMC Work Plan (Draft RMC Work Plan) in FY 2009-10 (see Appendix B1). Applicable management questions, descriptions of over 30 RMC monitoring projects, and associated project schedules are included in the Draft RMC Work Plan. Monitoring projects described in the Draft RMC Work Plan that were approved by the BOD and begun in FY 2009-10 include:

- Creek Status and Long-Term Trends Monitoring Standard Operating and Data Quality Assurance Procedures
- Creek Status and Long-Term Trends Standard Contract Language and Reporting Formats
- Multi-Year Pollutants of Concern (POC) Sampling Plan
- POC Standard Operating and Quality Assurance Procedures
- POC Laboratory Standard Contract Language and Reporting Formats
- POC Monitoring Information Management System Development
- POC Information Management and Quality Control
- Sediment Estimate Budget Development

Additional RMC monitoring projects described in the Draft RMC Work Plan are being considered for approval as Regional Projects by the BOD in FY 2010-11 and for future fiscal years through annual planning. Status reports on RMC projects that began in FY 2009-10 are included under the applicable MRP C.8 provision in this report.

C.8.b San Francisco Estuary Receiving Water Monitoring

As described in Provision C.8.b, Permittees are required to contribute their fair-share financially on an annual basis towards implementing an Estuary receiving water monitoring program that at a minimum is equivalent to the Regional Monitoring Program for Water Quality in the San Francisco Estuary (RMP). During FY 2009-10, Permittees complied with this provision by making financial contributions to the RMP directly or through stormwater programs (Appendix B2). Additionally, Permittees actively participated in RMP committees and work groups through Permittee and/or stormwater program staff as described below. The following sections provide a brief description of the RMP, associated monitoring activities conducted in FY 2009-10, and Permittee participation RMP committees and work groups.

Regional Monitoring Program (RMP)
The Regional Monitoring Program for Water Quality in the San Francisco Estuary is a long-term monitoring program that shares financial support, direction, and participation by regulatory agencies and the regulated community with the goal of assessing water quality in the San Francisco Bay. The regulated community includes Permittees, publicly owned treatment works (POTWs), dredgers and industrial dischargers. The RMP is intended to answer the following core management questions:

- Are chemical concentrations in the Estuary potentially at levels of concern and are associated impacts likely?
- What are the concentrations and masses of contaminants in the Estuary and its segments?
- What are the sources, pathways, loadings, and processes leading to contaminant related impacts in the Estuary?
- Have the concentrations, masses, and associated impacts of contaminants in the Estuary increased or decreased?
- What are the projected concentrations, masses, and associated impacts of contaminants in the Estuary?

The RMP budget is generally broken into two major program elements: Status and Trends, and Pilot/Special Studies. The following paragraphs provide a brief overview of these programs.

RMP Status and Trends Monitoring Program
The Status and Trends Monitoring Program (S&T Program) is the long-term contaminant-monitoring component of the RMP. The S&T Program was initiated as a pilot study in 1989 and redesigned in 2007 based on a more rigorous statistical design that enables

the detection of trends. In FY 2009-10, the S&T Program was comprised of the following program elements that collect data to address RMP management questions described above:

- Water/Sediment/Biota Chemistry and Toxicity Monitoring
- Sediment Benthos Monitoring
- Small and Large Tributary Loading Studies
- Small Fish and Sport Fish Contamination Studies
- Studies to Determine the Causes of Sediment Toxicity
- Suspended Sediment, Hydrography and Phytoplankton Monitoring
- Bird Egg Monitoring

Additional information on the S&T Program and associated monitoring data are available for downloading via the RMP website using the Status and Trends Monitoring Data Access Tool at www.sfei.org/rmp/data.htm.

RMP Pilot and Special Studies
The RMP also conducts Pilot and Special Studies (P/S Studies) on an annual basis. Studies usually are designed to investigate and develop new monitoring measures related to anthropogenic contamination or contaminant effects on biota in the Estuary. Special Studies address specific scientific issues that RMP committees and standing workgroups identify as priority for further study. These studies are developed through an open selection process at the workgroup level and selected for funding through RMP committees. Results and summaries of the most pertinent P/S Studies can be found on the RMP website (www.sfei.org/rmp/).

Participation in Committees, Workgroups and Strategy Teams
In FY 2009-10, Permittees actively participated in the following RMP committees and work groups:

- Steering Committee (SC)
- Technical Review Committee (TRC)
- Sources, Pathways and Loadings Workgroup (SPLWG)
- Contaminant Fate Workgroup (CFWG)
- Exposure and Effects Workgroup (EEWG)
- Emerging Contaminant Workgroup (ECWG)
- Sport Fish Monitoring Workgroup
- Toxicity Workgroup
- Strategy Teams (e.g., PCBs, Mercury, Dioxins, Small Tributaries)

Committee and workgroup representation was provided by Permittee, stormwater program staff and/or designees that were agreeable to RMC participants and the BASMAA Board of Directors (BOD). Representation included participating in meetings, reviewing technical reports and work products, co-authoring articles included in the RMP's Pulse of the Estuary, and providing general program direction to RMP staff. Representatives of the RMC also provided timely summaries and updates to, and

received input from stormwater programs representative (on behalf of Permittees) during MPC and/or BOD meetings to ensure Permittees interests were adequately represented.

C.8.c Creek Status Monitoring

Provision C.8.c requires Permittees to conduct creek status monitoring that is intended to answer the following management questions:

1. Are water quality objectives, both numeric and narrative, being met in local receiving waters, including creeks, river and tributaries?
2. Are conditions in local receiving waters supportive of or like supportive of beneficial uses?

Creek status monitoring parameters, methods, occurrences, durations and minimum number of sampling sites for each stormwater program are described in Table 8.1 of the MRP. Based on the implementation schedule described in MRP Provision C.8.a(ii), Permittees were not required to conduct creek status monitoring in FY 2009-10. Alternatively, Permittee and stormwater program staff (on behalf of Permittees) spent considerable time identifying and scoping RMC projects included in the Draft RMC Work Plan. Planning efforts conducted in FY 2009-10 were intended to assist Permittees in designing and implementing a regional creek status monitoring program that will allow each stormwater program to assess the status of local water bodies, while contributing data to answering regional questions about water quality and beneficial use condition in all Bay Area creeks.

As described in the RMC Draft Work Plan, most creek status monitoring tasks will begin in FY 2010-11, with the exception of standard operating and data quality assurance procedure development, which is described under Provision C.8.h in this report. Additional information on the status of RMC tasks associated with Provision C.8.c (Creek Status Monitoring) will be included in future Annual Reports.

C.8.d Monitoring Projects

Three types of monitoring projects are required by Provision C.8.d of the MRP: 1) Stressor/Source Identification (C.8.d.i); 2) BMP Effectiveness Investigation (C.8.d.ii); and 3) Geomorphic Project (C.8.d.iii). Based on the compliance schedules described in the MRP for these provisions, in FY 2009-10 Permittees focused mostly on scoping future collaborative RMC projects associated with these requirements. These projects are generally described in the Draft RMC Work Plan (see Appendix B1) and will be implemented in future fiscal years.

C.8.e Pollutants of Concern and Long-Term Trends Monitoring

POC Loads Monitoring

Pollutants of Concern (POC) loads monitoring is required by Provision C.8.e (i) of the MRP. Loads monitoring is intended to assess inputs of POCs to the Bay from local tributaries and urban runoff, assess progress toward achieving wasteload allocations (WLAs) for TMDLs, and help resolve uncertainties associated with loading estimates for these pollutants. In particular, there are four priority management questions that need to be addressed though POC loads monitoring:

1. Which Bay tributaries (including stormwater conveyances) contribute most to Bay impairment from POCs;
2. What are the annual loads or concentrations of POCs from tributaries to the Bay;
3. What are the decadal-scale loading or concentration trends of POCs from small tributaries to the Bay; and
4. What are the projected impacts of management actions (including control measures) on tributaries and where should these management actions be implemented to have the greatest beneficial impact.

Based upon compliance schedules described in MRP Provision C.8.a(ii), participants of the RMC are required to begin POC loads monitoring in October 2011. Therefore, RMC participant activities associated with POC loads monitoring during FY 2009-10 were generally spent preparing for monitoring in future years. More specifically, Permittees continued to monitor POC loads via the RMP (i.e., Zone 4 – Line A) and began exploring alternative approaches to POC loads monitoring prescribed in Provision C.8.e. As described below, Permittee exploration of alternative approaches occurred through the RMP's Small Tributary Loading Strategy (STLS) Team, which includes RMC representatives, Water Board staff, RMP staff and technical advisors.

Small Tributaries Loading Strategy (STLS)

To assist Permittees in effectively and efficiently conducting POC loads monitoring required by the MRP and answer POC loads management questions , a draft Small Tributaries Loading Strategy (STLS) was developed in 2009 by the STLS Team (Appendix B3). The objective of the STLS is to develop a comprehensive planning framework for POC loads monitoring/modeling within which associated activities conducted via the RMP and monitoring by Permittees in compliance with the MRP will be complementary.

<u>FY 2009-10 STLS Projects</u>

Consistent with the STLS, POC loads monitoring continued at one station and special studies designed inform future loads monitoring were conducted via the RMP in FY 2009-10. More specifically, the following three RMP special studies related to POC loads monitoring began/continued in FY 2009-10:

- Small Tributaries Loads Monitoring – Loads monitoring continued in Zone 4-Line A, a small flood control channel located in Hayward that drains to the Bay. The watershed draining to the monitoring site is highly impervious and comprised of mostly industrial land use. Fiscal Year 2009-10 served as the fourth year of monitoring at this site.
- Watershed Categorization - The STLS Team conducted a desktop study in FY 2009-10 that categorized watersheds into different "types" based on a variety of watershed characteristics (e.g., land use, imperviousness, area, sediment loading, and contaminant history). The goal of this study was to assist the RMP and Permittees in selecting groups of tributaries where POC loads monitoring will occur.
- Sampling Methods Comparison - This study evaluated a variety of POC loads sampling methods, including currently employed RMP sampling methods (e.g., turbidity surrogate) and MRP default sampling methods (i.e., flow-weighted composite), in an effort to develop recommendations on the most cost effective methods that could be employed Permittees and still adequately address POC loads management questions.

Results of these studies are currently in draft form and will be finalized by early 2011. Additional STLS studies that began in FY 2009-10 include the initial development of a spreadsheet model designed to estimate POC loads from specific watersheds to the Bay, and scoping the need for the development of Event Mean Concentrations (EMCs) for specific POCs. These studies/projects are planned to be completed in FY 2010-11 via the RMP and intended to provide additional tools to assist Permittees in answering POC loads management questions.

FY 2010-11 Projects

In addition to STLS projects mentioned above that will continue in FY 2010-11, an additional related project will also begin in late 2010. As an alternative to conducting long-term POC loads monitoring at bottom of watershed locations (e.g., Zone 4 – Line A), the STLS Team agreed that the RMP should conduct a geographically broader study in FY 2010-11 to characterize POC concentrations in a number of small tributaries in the Bay Area. The STLS Team is currently developing the full scope of the study, but it will generally be designed to further assist Permittees in selecting POC loads monitoring sites. The project will occur early in the FY 2010-11 wet weather season (October 2010 – April 2011) and entail the collection and analysis of POCs in water from between 15 and 20 small tributaries during one or two storms. The proposed list of POC analytes for this reconnaissance includes PCBs, total mercury, PBDEs, and polycyclic aromatic hydrocarbons (PAHs). A report documenting the results of the characterization study is planned for completion in early 2011.

All FY 2009-10 and FY 2010-11 STLS studies described above are intended to assist Permittees in complying with Provision C.8.e through alternative approaches to those prescribed in the MRP. Based on the results of these studies and Permittee input, RMC participants may choose to propose an alternative approach to POC loads monitoring to the Water Board's Executive Officer (EO). If an alternative approach is agreed to

among RMC participants, an *RMC Multi-Year POC Loads Monitoring Plan* (POC Loads Monitoring Plan) documenting the alternative approach will be submitted to the Water Board EO for approval prior to commencement of POC loads monitoring required by the MRP (October 2011). The POC Loads Monitoring Plan will include the rationale for the choice of sampling locations and methods (i.e., number and type of samples, number of storms, and recurrence interval for sampling).

Long-Term Trends Monitoring

In addition to POC loads monitoring, Provision C.8.e requires Permittees to conduct long-term trends monitoring to evaluate if stormwater discharges are causing or contributing to toxic impacts on aquatic life. Required long-term monitoring parameters, methods, intervals and occurrences are included in Table 8.4 of the MRP and prescribed long-term monitoring locations are included in Table 8.3. Applying MRP Provision C.8.a in a manner similar to that described above for creek status and POC loads monitoring, long-term trends monitoring is scheduled to begin in October 2011 for RMC participants.

The State of California's Surface Water Ambient Monitoring Program (SWAMP) through its Statewide Stream Contaminant Trend Monitoring Program currently monitors the seven long-term monitoring sites required by Provision C.8.e.ii, at the sampling occurrence and interval described in Provision C.8.e.iii in the MRP. Although a long-term trends design for creeks will likely be included in the design of the RMC creeks monitoring design, at this time, RMC participants continue to assume that SWAMP will continue to conduct long-term monitoring at a level of effort necessary to comply with the long-term trends requirement in the MRP (as allowed by Provision C.8.e.ii). In FY 2010-11, RMC representatives will confirm that SWAMP will continue the current level of effort of this program in future years and plan accordingly.

Sediment Delivery Estimate/Budget

Provision C.8.e(vi) of the MRP requires Permittees to develop a design for a robust sediment delivery estimate/sediment budget in local tributaries and urban drainages, and implement the study by July 1, 2012. The purpose of the sediment delivery estimate is to improve the Permittees' ability to estimate urban runoff contributions to loads of POCs, which are generally closely associated with sediment. To determine a strategy for a robust sediment estimate/budget, the BASMAA Board of Directors (BOD) approved a Regional Project in FY 2009-10 to begin reviewing current sediment delivery estimates, better define the objectives for improvement and determine what additional work is needed in FY 2010-11. Tasks that may be coordinated through the RMC include: 1) updating sediment delivery estimates recently completed via the RMP by incorporating an improved watershed boundaries dataset, that will also be the basis for future spreadsheet modeling of POC loads under the STLS; 2) listing potential data needs and the extent to which they will be filled through the STLS and MRP creek monitoring; and 3) identifying methods and a schedule for incorporating the above to produce a robust estimate/budget. Additional information on the status of this project will be included in the FY 2010-11 Annual Report.

Emerging Pollutants Work Plan
In compliance with Provision C.8.e.v, Permittees are required by March 2014 to develop a work plan and schedule for initial loading estimates and source analyses for the following emerging pollutants: 1) endocrine-disrupting compounds; 2) PFOS/PFAS (Perfluorooctane Sulfonates (PFOS); 3) Perfluoroalkyl Sulfonates (PFAS); and 4) and NP/NPEs (nonylphenols/nonylphenol esters —estrogenlike compounds). The intent of the work plan is to begin planning for implementation during the next permit term (i.e., post December 2014). Because the compliance date for completion of this work plan is over four years into the future, only initial discussions of the scope of this project were discussed in FY 2009-10 by the MPC. BASMAA Representatives t the RMP will coordinate efforts with the Emerging Contaminants Strategy being developed by the RMP through the Master Planning process. Additional information on the status of this project will be provided in subsequent Annual Reports.

C.8.f Citizen Monitoring and Participation

Participants of the RMC, to varying degrees, currently coordinate with or support citizen monitors within their geographical areas. As a result, relationships have been developed between RMC participants and citizen monitors. In FY 2009-10, Permittees began to plan for future coordination with citizen monitors in their respective geographical areas. Information sharing among RMC participants about activities designed to encourage citizen monitoring is planned to occur in FY 2010-11 and future years at MPC meetings.

C.8.g Reporting

Provision C.8.g requires Permittees to report annually on water quality data collected in compliance with the MRP. Annual reporting requirements include: 1) water quality standard exceedances; 2) creek status monitoring electronic reporting; and 3) urban creeks monitoring reporting. For RMC participants, annual reporting requirements begin following monitoring which is scheduled to commence in October 2011. Therefore, reporting of water quality monitoring data collected in compliance with the Provision C.8 of the MRP is not required in this FY 2009-10 Annual Report.

In preparation for the development of future annual reports described above, and less frequent reporting requirements included in Provisions C.8.g.iv (Monitoring Project Reports) and C.8.g.v (Integrated Monitoring Report), the Draft RMC Work Plan describes projects planned for implementation in future fiscal years. These projects include: 1) standardized reporting templates for creek status electronic reporting; 2) model annual urban creeks monitoring report templates; and 3) reporting templates and outlines for the integrated monitoring report due near the end of the permit term.

C.8.h Monitoring Protocols, Data Quality and Data Management

Provision C.8.h requires that water quality data collected by Permittees in compliance with the MRP should be of a quality that is consistent with the State of California's Surface Water Ambient Monitoring Program (SWAMP) standards, set forth in the SWAMP

Quality Assurance Project Plan (QAPP). To assist Permittees in meeting SWAMP data quality standards and developing data management systems that allow for easy access of water quality monitoring data by Permittees, the RMC began scoping and/or implementing regional projects in FY 2009-10. These include:

- Standard Operating and Data Quality Assurance Procedures – Two projects designed to address monitoring protocols and data quality requirements described in Provision C.8.h were approved by the BOD in FY 2009-10. The first entails the development of a new field standard operating procedure (SOP) and quality assurance project plan (QAPP) for POC loads monitoring. The SOP and QAPP will be completed in FY 2010-11 once a final sampling methodology for POC loads monitoring is agreed to by RMC participants (see POC Loads Monitoring discussion). The second project entails the adaptation of existing creek status monitoring SOPs and QAPP developed by SWAMP or creation of new SOPs, as necessary, that document the field procedures necessary to maintain comparable and high quality data region-wide. The project is also scheduled for completion in FY 2010-11.
- Information Management System Development/Adaptation – As described in the Draft RMC Work Plan, participants would like to store and manage water quality data collected in compliance with Provision C.8 in a cost effective manner that allows data users to easily access and query data and information. Therefore, in FY 2009-10 the RMC began scoping a series of Regional Projects that are scheduled to begin in FY 2010-11 and designed to develop new or adapt existing Information Management Systems (IMSs) for use by the RMC. The goal of these projects is to provide standardized data storage formats, thus providing a mechanism for sharing data among RMC participants. MRP Provision C.8.e.vi requires Permittees to develop a design for a robust sediment delivery estimate/sediment budget in local tributaries and urban drainages, and implement the study by July 1, 2012. The purpose of the sediment delivery estimate is to improve the Permittees' ability to estimate urban runoff contributions to loads of Pollutants of Concern, which are generally closely associated with sediment.

ACRONYMS AND ABBREVIATIONS

BASMAA	Bay Area Stormwater Management Agencies Association
BMP	Best Management Practice
BOD	Board of Directors (of BASMAA)
CASQA	California Stormwater Quality Association
CW4CB	Clean Watersheds for a Clean Bay (BASMAA project)
MPC	Monitoring and Pollutants of Concern Committee (of BASMAA)
MRP	Municipal Regional Stormwater Permit (NPDES)
NPDES	National Pollutant Discharge Elimination System
PBDEs	Polybrominated Diphenyl Ethers
PCBs	Polychlorinated Biphenyls
POCs	Pollutants of Concern
POTWs	Publicly Owned Treatment Works
RMP	Regional Monitoring Program for Water Quality in the San Francisco Estuary
RMC	BASMAA Regional Monitoring Coalition
SFEI	San Francisco Estuary Institute
STLS	Small Tributaries Loading Strategy (of the RMP)
TMDL	Total Maximum Daily Load
Water Board	San Francisco Bay Regional Water Quality Control Board
WLAs	Wasteload Allocations (in TMDLs)

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

September 15, 2010

FY 2009-2010 Annual Report

Submitted in Compliance with NPDES Permit No. CAS612008 (Order R2-2009-0074)

Program Annual Report
Appendices

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

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A3 Clean Watersheds for a Clean Bay (CW4CB) Project Status. Memorandum prepared by Kristin Kerr and Jon Konnan, EOA, Inc., for the CW4CB Project Management Team. September 13, 2010.
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Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 1-1

Signed Confirmation Statements from each Co-permittee designating a MC representative and/or alternate

September 15, 2010

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: August 10, 2010

Name of Co-Permittee: City of Campbell

Name of Management Committee Representative: Bill Helms

Name of Management Committee Alternate (if any): Kelly Carroll

This is confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Appropriately Delegated Supervisor: [signature]

Title of Appropriately Delegated Supervisor: Executive Project Manager

2871733

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: 8/5/10

Name of Co-Permittee: City of Cupertino

Name of Management Committee Representative: Cheri Donnelly

Name of Management Committee Alternate (if any): GLENN GOEPFERT

This is confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Appropriately Delegated Supervisor: Glenn Goepfert

Title of Appropriately Delegated Supervisor: ASST. DIR. OF PUBLIC WORKS

2871733

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: August 23, 2010

Name of Co-Permittee: City of Los Altos

Name of Management Committee Representative: Larry Lind

Name of Management Committee Alternate (if any): Aida Fairman

This is to confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Appropriately Delegated Supervisor: Jim Gustafson

Title of Appropriately Delegated Supervisor: Engineering Services Manager

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: 8/26/10

Name of Co-Permittee: TOWN OF LOS ALTOS HILLS

Name of Management Committee Representative: RICHARD CHIU

Name of Management Committee Alternate (if any): JOHN CHAU

This is confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Appropriately Delegated Supervisor: Richard Chiu

Title of Appropriately Delegated Supervisor: P.W. Director / City Engr.

2871733

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: August 10, 2010

Name of Co-Permittee: Town of Los Gatos

Name of Management Committee Representative: Todd Capurso

Name of Management Committee Alternate (if any): Kelly Carroll

This is confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Appropriately Delegated Supervisor: Todd Capurso

Title of Appropriately Delegated Supervisor: Director of Parks and Public Works

2871733

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: July 28, 2010

Name of Co-Permittee: City of Milpitas

Name of Management Committee Representative: Kathleen Phalen

Name of Management Committee Alternate (if any): Paramjit Uppal

This is to confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Appropriately Delegated Supervisor: _____
Thomas C. Williams

Title of Appropriately Delegated Supervisor: City Manager

2871733

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: August 10, 2010

Name of Co-Permittee: City of Monte Sereno

Name of Management Committee Representative: Brian Loventhal

Name of Management Committee Alternate (if any): Kelly Carroll

This is confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Appropriately Delegated Supervisor:

Title of Appropriately Delegated Supervisor: City Manager

2871733

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: August 23, 2010

Name of Co-Permittee: City of Mountain View

Name of Management Committee Representative: Eric Anderson

Name of Management Committee Alternate (if any): _____

This is confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Appropriately Delegated Supervisor: _____

Title of Appropriately Delegated Supervisor: Fire Marshal

Signature of Principal Executive Officer: _____

Kevin Duggan
City Manager

2871733

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: 7/27/2010

Name of Co-Permittee: City of Palo Alto

Name of Management Committee Representative: Joe Teresi

Name of Management Committee Alternate (if any): Phil Bobel

This is confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Appropriately Delegated Supervisor: [signature]

Title of Appropriately Delegated Supervisor: Director of Public Works

2871733

CITY OF SAN JOSE
CAPITAL OF SILICON VALLEY

Environmental Services Department

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: ***August 24, 2010***

Name of Co-permittee: ***City of San José***

Name of Management Committee Representative: ***Melody Tovar, Deputy Director***

Name of Management Committee Alternate (if any): ***Elaine Marshall, Environmental Program Manager***

This is confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Appropriately Delegated Supervisor:

Title of Appropriately Delegated Supervisor: ***John Stufflebean Director, Environmental Services***

200 E. Santa Clara Street, 10th Floor, San José, CA 95113-1905 *tel* (408) 535-8550 *fax* (408) 292-6212
www.sanjoseca.gov

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: July 21, 2010

Name of Co-Permittee: City of Santa Clara

Name of Management Committee Representative: Dave Staub

Name of Management Committee Alternate (if any): Mark Gervacio

This is confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Appropriately Delegated Supervisor: [signature]

Title of Appropriately Delegated Supervisor: Acting Director of Streets and Automotive Services / City Arborist

2871733

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: August 10, 2010

Name of Co-Permittee: City of Saratoga

Name of Management Committee Representative: John Cherbone

Name of Management Committee Alternate (if any): Kelly Carroll

Alternate#2: Kristin Borel

This is confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Appropriately Delegated Supervisor:

Title of Appropriately Delegated Supervisor: Director of Public Works

2871733

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: August 25, 2010

Name of Co-Permittee: City of Sunnyvale

Name of Management Committee Representative: Lorrie Gervin

Name of Management Committee Alternate (if any): Kristy McCumby Hyland

This is confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Appropriately Delegated Supervisor: Manu C Rao

Title of Appropriately Delegated Supervisor: Director of Public Works

2871733

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: 8-12-10

Name of Co-Permittee: County of Santa Clara

Name of Management Committee Representative: Clara Spaulding

Name of Management Committee Alternate (if any): Gary Park

This is confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Appropriately Delegated Supervisor: Thomas P. Whisler

Title of Appropriately Delegated Supervisor: Thomas P. Whisler

2871733

CONFIRMATION OF AUTHORIZATION FOR NPDES PERMIT SUBMITTALS BY SCVURPPP PROGRAM MANAGER

Date: September 1, 2010

Name of Co-Permittee: Santa Clara Valley Water District

Name of Management Committee Representative: Ann Draper

Name of Management Committee Alternate (if any): Brett Calhoun

This is confirm that the above referenced individuals have been officially designated and duly authorized to vote in their capacities as representative and alternate representative to the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVUPPP) Management Committee, and that such prior designations and authorizations extend to casting votes to direct the SCVURPPP Program Manager to provide certain reports to the California Regional Water Quality Control Board, San Francisco Bay Region (Regional Water Board) on behalf of the above referenced co-permittee as required by NPDES permits adopted by the Regional Water Board and in compliance with the signatory and certification for such reports in the manner required as specified by the Regional Water Board with respect to municipal stormwater permit programs in the San Francisco Bay Area.

Signature of Chief Executive Officer:

2871733

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 3-1

"Complying with New Stormwater Requirements for New and Redevelopment Projects" Workshop – June 8, 2010

- Workshop Announcement
- Workshop Agenda
- Attendance List
- Workshop Evaluations Responses

Complying with New Stormwater Requirements for New and Redevelopment Projects Workshop

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June 8, 2010

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

American Planning Association
California Chapter
Northern
Making Great Communities Happen

WMI
WATERSHED MANAGEMENT INITIATIVE

Present

ANNUAL C.3. STORMWATER WORKSHOP:

"Complying with New Stormwater Requirements for New and Redevelopment Projects"

Tuesday, June 8, 2010
9:00 am – 3:30 pm
Quinlan Community Center
10185 North Stelling Road
Cupertino, CA 95014-5732

Who should attend this workshop: Stormwater program coordinators; planning and public works staff who select, review and approve development projects and design and construct public projects. Members of the development community are also welcome to attend.

Workshop agenda: This full-day workshop will include regulatory updates on the Municipal Regional Permit and a panel presentation on implementing stormwater requirements at local new and redevelopment projects. There will be two tracks in the afternoon session. One track will offer an introduction to hydromodification management requirements and the Bay Area Hydrology Model. The other track will offer advanced training on low impact development topics including rainwater harvesting, green roofs, soil specifications, and retrofitting impervious areas with landscaping.

The Workshop will also include vendor exhibits.

New this year: AICP Certification Maintenance Credits (Pending)

*There will be **no charge** for the workshop. Continental breakfast & box lunch will be served.*
Please pass this flyer to appropriate staff within your organization.

REGISTRATION FORM: **Date: June 8, 2010**

Name: _____

Title: _____

Agency/Company: _____

Phone: _____ **Email:** _____

Please complete and email to Miranda@eoainc.com or fax to the Santa Clara Valley Urban Runoff Program office (fax no. 408- 720-8812) no later than Friday, June 4, 2010.
Questions? Call Miranda at 408-720-8811

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

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San Jose • Santa Clara • Saratoga • Sunnyvale • Santa Clara County • Santa Clara Valley Water District

ANNUAL C.3. STORMWATER WORKSHOP:

"Complying with New Stormwater Requirements for New and Redevelopment Projects"

Tuesday, June 8, 2010
Quinlan Community Center
10185 N. Stelling Road
Cupertino, CA 95116

WORKSHOP AGENDA

8:30 AM	Registration and Refreshments	
9:00 AM	Welcome and Introduction • Site Design for Protecting Water Quality – 2010 Award Winning Projects	Jill Bicknell *SCVURPPP*
9:10 AM	What's New in Stormwater Regulations? Challenges for Municipalities and the Development Community • Municipal Regional Permit • State Construction General Permit	Jill Bicknell *SCVURPPP*
9:40 AM	Performance of Bioretention Areas	
	Serramonte Library/Gellert Park Parking Lot – "Green Streets" Demonstration Project	Jonathan Buck *ENGEO*
	Green Infill for Clean Stormwater	Nicole David *San Francisco Estuary Institute*
10:20 AM	Overcoming Obstacles to LID Implementation – Tales from Silicon Valley	Mike Campbell *HMH*
10:50 AM	**Break**	
11:00 AM	Panel Discussion –Implementation of C.3. in Local Projects	
	Stevens Creek Corridor Park and Restoration Project	Gail Seeds *Cupertino*
	Mitchell Park Library & Community Center	Joe Teresi *Palo Alto*
	Happy Hollow Park and Zoo	Glenn Rock *San Jose*
	VMware Headquarters Building	Jacob Nguyen *BFK Engineers*
	The Self-Watering House	Forrest Linebarger

12:00 PM	**Lunch and Vendor Exhibits**	
	Track 1 – HMP 101 (Location: Social Room)	Jill Bicknell *SCVURPPP*
12:45 PM	Introduction, Overview of Requirements	
1:30 PM	HMP Applicability Maps	
2:15 PM	**Break, Vendor Exhibits, and Refreshments**	
2:30 PM	Case Studies	
3:00 PM	Bay Area Hydrology Model	
3:30 PM	Adjourn	
	Track 2 – Advanced C.3. Topics (Location: Cupertino Room)	
12:45 pm	Integrated Water Harvesting & Watershed- Based Stormwater Planning	Bill Wilson *Carlile Macy*
1:30 PM	Green Roofs: From Concept to Reality	Sarah Sutton *Design, Community & Environment*
2:15 PM	**Break, Vendor Exhibits, and Refreshments**	
2:30 PM	Using the Bay-Friendly Landscape Standards to Implement Low Impact Development in the San Francisco Bay Area	Teresa Eade *StopWaste.org*
3:00 PM	Retrofit Case Studies	
	Double Duty: Working Landscapes for Urban Settings	Jane Martin *PlantSF*
	San Jose Sidewalk Landscaping: Site #1	Carrie Jensen *H. T. Harvey Associates*
3:30 PM	Adjourn	

"Complying with New Stormwater Requirements for New and Redevelopment Projects"

	Last	First	Municipality	Phone/Fax	Email
1	Adrian	Shane	Los Gatos	408-395-3460	sadrian@losgatosca.gov
2	Alba	Roy	Los Gatos	408-399-5720	ralba@losgatosca.gov
3	Alvarez	Michael	Santa Clara Co	408-299-5738	michael.alvarez@pln.sccgov.org
4	Anderson	Eric	Mountain View	650-903-6225	eric.anderson@mountainview.gov
5	Angeles	Maria	San Jose	408-292-6054	maria.angeles@sanjoseca.gov
6	Apelo	Renee	San Jose		
7	Arango	Ed	Campbell	408-866-2166	EdwardA@cityofcampbell.com
8	Aslin	Akrista	WVCWP	408-354-4734	aaslin@wvcwp.org
9	Bhagat	Payal	Santa Clara	408-614-2450	PBhagat@santaclaraca.gov
10	Bocalan	Michelle	Los Altos	650-947-2602	mbocalan@losaltosca.gov
11	Borrelli	Juan	San Jose	408-277-8415	juan.borrelli@sanjoseca.gov
12	Buikema	Rich	San Jose		
13	Byrer	Quynh	Mountain View	650-903-6311	quynh.byrer@mountainview.gov
14	Caldwell	Marcum		949-677-6032	marcumcaldwell@yahoo.com
15	Caliva	Noren	Sunnyvale	408-730-7637	ncaliva@ci.sunnyvale.ca.us
16	Calnan	Ann	VTA	408-321-5976	ann.calnan@vta.org
17	Chan	Patrick	BKF Engineers	408-467-9188	pchan@bkf.com
18	Chapatte	Ryan	Ifland Engineers, Inc.	831-426-5313	ryanchapatte@iflandengineers.com
19	Chau	John	Los Altos Hills	650-941-7222	jchau@losaltoshills.ca.gov
20	Chen	Guixiang	San Jose	408-743-4108	guixiang.chen@sanjoseca.gov
21	Chen	Richard	Sunnyvale	408-730-7414	RChen@ci.sunnyvale.ca.us
22	Cheung	Ron	San Jose	408-535-8361	ron.cheung@sanjoseca.gov
23	Chiu	Richard	Los Altos Hills	650-941-7222	rchiu@losaltoshills.ca.gov
24	Chou	Jason	Mountain View	650-903-6311	jason.chou@mountainview.gov
25	Chun	Bennett	Sunnyvale	408-730-7636	bchun@ci.sunnyvale.ca.us
26	Cosentino	Marcelo	BKF Engineers		
27	Crawford	Renee	Nolte Associates, Inc.	408-392-7200	renee.crawford@nolte.com
28	Cutler	Jennifer	Palo Alto	650-329-2149	jennifer.cutler@cityofpaloalto.org
29	Dinwiddie-Moore	Jeanette	Dinwiddie & Associates	510-531-4150	dinwidd@attglobal.net
30	Donnelly	Cheri	Cupertino	408-777-3242	cherid@cupertino.org
31	Duazo	Ed	Santa Clara Co	408-299-5733	ed.duazo@pln.sccgov.org
32	Dyke	Joseph	San Jose	408-535-6821	joseph.dyke@sanjoseca.gov
33	Eduarte	Joy	San Jose	408-793-4112	joy.eduarte@sanjoseca.gov
34	Edwards	DJ	KPFF Engineers	415-989-1004	dj.edwards@kpff-sf.com
35	Fairman	Aida	Los Altos	650-947-2603	afairman@losaltosca.gov

"Complying with New Stormwater Requirements for New and Redevelopment Projects"

	Last	First	Municipality	Phone/Fax	Email
36	Fire	Genevieve	Genevieve Fire	650-969-4386	gsfire@sbcglobal.net
37	Frederick	Mark	Santa Clara Co	408-355-2210	mark.frederick@prk.sccgov.org
38	Fujimoto	Chris	Palo Alto	650-329-2430	christopher.fujimoto@cityofpaloalto.org
39	Ghosal	Sanhita	San Jose	408-277-8420	sanhita.ghosal@sanjoseca.gov
40	Guevarra	Francis	San Jose	408-501-0936	francis.guevarra@sanjoseca.gov
41	Hada	Rajeev	Palo Alto	650-329-2469	rajeev.hada@cityofpaloalto.org
42	Halleck	Bill	San Jose	408-535-8375	Bill.Halleck@sanjoseca.gov
43	Halvorsen	Anne	Mountain View	650-903-6311	anne.halvorsen@mountainview.gov
44	Hart	Jared	San Jose	408-277-3575	jared.hart@sanjoseca.gov
45	Harvancik	Iveta	Saratoga	408-868-1274	iharvancik@saratoga.ca.us
46	Heinrichsen	David	Ifland Engineers, Inc.	831-426-5313	dh@iflandengineers.com
47	Heydari	Fariborz	Milpitas	408-586-3303	fheydari@ci.milpitas.ca.gov
48	Hoang-Mendoza	Catherine	San Jose	408-277-3993	catherine.hoang-mendoza@sanjoseca.gov
49	Hom	Alan	Campbell	408-866-2168	alanh@cityofcampbell.com
50	Honda Snelling	Aki	Cupertino	408-777-3313	akis@cupertino.org
51	Hovland	Christina	EOA Inc		
52	Huang	Jin	Sunnyvale		
53	Johns	Scott	ENGEO		
54	Johnson	Ron	Santa Clara Co	408-993-4630	ron.johnson@faf.sccgov.org
55	Johnson	Scott	Santa Clara Co	408-299-5706	scott.johnson@pln.sccgov.org
56	Jung	Colin	Cupertino	408-777-3257	colinj@cupertino.org
57	Kadkhodayan	Manny	Sunnyvale	408-730-7430	MKadkhodayan@ci.sunnyvale.ca.us
58	Koo	Michelle	Hayward	510-583-4732	michelle.koo@hayward-ca.gov
59	Krupp	Matt	San Jose	408-945-5182	mall.krupp@sanjoseca.gov
60	Kuzia	John	MacKay & Somps Civil Engineers, Inc.	925.416.1790	jkuzia@msce.com
61	Lear	Jim	Hayward	510-583-4785	Jim.Lear@hayward-ca.gov
62	Lee	Elena	Palo Alto	650-617-3196	elena.lee@cityofpaloalto.org
63	Lee	Eric	Mountain View	650-969-8567	el_7772000@yahoo.com
64	Lind	Larry	Los Altos	650-947-2624	llind@losaltosca.gov
65	Liw	Michael	San Jose	408-535-6835	michael.liw@sanjoseca.gov
66	Loatfi	Morgan	San Jose	408-535-8394	morgan.loatfi@sanjoseca.gov
67	Lunetta	John	Sunnyvale	408-730-2770	JLunetta@ci.sunnyvale.ca.us
68	Lynaugh	Carmen	Cupertino	408-777-3354	carmenl@cupertino.org
69	Marello	Jeremy	BKF Engineers	408-467-9157	jmarello@bkf.com

"Complying with New Stormwater Requirements for New and Redevelopment Projects"

	Last	First	Municipality	Phone/Fax	Email
70	Marshall	Elaine	San Jose	408-277-5697	elaine.marshall@sanjoseca.gov
71	McCumby-Hyland	Kristy	Sunnyvale	408-730-7274	kmccumby@ci.sunnyvale.ca.us
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73	Moore	Steve	Saratoga	408-868-1228	smoore@saratoga.ca.us
74	Mosley	Chad	Cupertino	408-777-7604	ChadM@cupertino.org
75	Mu	Huimin	San Jose	408-535-6888	huimin.mu@sanjoseca.gov
76	Mulvey	Trish	CLEAN South Bay	650-326-0252	mulvey@ix.netcom.com
77	Murphy	Jared	Hatch Mott MacDonald	408-572-8798	jared.murphy@hatchmott.com
78	Nakagawara	Harry	Orsee Design Associates	408-283-2199	hnakagawara@orseedesign.com
79	Nakagawara	Arlene	San Jose	408-535-8403	arlene.nakagawara@sanjoseca.gov
80	Naraval	Herbert	Santa Clara Co	408-494-1308	herbert.naraval@rda.sccgov.org
81	Nguyen	John	Hayward	510-583-4111	John.Nguyen@hayward-ca.gov
82	Oxonian	Alberto	Campbell	408-866-2162	albertoo@cityofcampbell.com
83	Palajac	Jan	San Jose	408-535-8408	jan.palajac@sanjoseca.gov
84	Parineh	Kristin	Palo Alto	650-329-2189	kristin.parineh@cityofpaloalto.org
85	Park	Gary	Santa Clara Co	408-386-7068	gary.park@pln.sccgov.org
86	Price	Liliana	Sunnyvale	408-730-7543	lprice@ci.sunnyvale.ca.us
87	Rado	Ken	Santa Clara Co	408-993-4610	ken.rado@faf.sccgov.org
88	Ragan	Chris	MacKay & Somps Civil Engineers, Inc.	925-225-0690	cragan@msce.com
89	Ramsey	David	Ifland Engineers, Inc.	831-426-5313	davidramsey@iflandengineers.com
90	Reamey	Paul	Palo Alto	650-329-2189	paul.reamey@cityofpaloalto.org
91	Rei	Matt	Kister Savio Rei	510-222-4020	matt@ksrinc.net
92	Reich	Russ	Palo Alto	650-617-3119	russ.reich@cityofpaloalto.org
93	Reyes	Jhay Delos	BFK Engineers	925-396-7700	jdelosreyes@bkf.com
94	Rhoades	Michael	San Jose	408-277-2773	michael.rhoades@sanjoseca.gov
95	Ruiz	Ana	Midpeninsula Regional Open Space District	650-691-1200	aruiz@openspace.org
96	Salvador	Albert	Cupertino	408-777-3228	AlbertS@cupertino.org
97	Sandahl	Carrie	Mountain View	650-903-6224	carrie.sandahl@mountainview.gov
98	Sciara	Gloria	Santa Clara	408-614-2450	gsciara@santaclaraca.gov
99	Silva	Catherine	Robert A. Bothman, Inc.	408-279-2277-353	csilva@bothman.com
100	Silva	Jose	San Jose	408-277-4571	jose.silva@sanjoseca.gov
101	Smith	Karla	Stanford	650-725-9802	karlat@stanford.edu
102	Souza	Steve	Los Gatos	408-395-3430	ssouza@losgatosca.gov
103	Spaulding	Clara	Santa Clara Co	408-299-5737	clara.spaulding@pln.sccgov.org
104	Tanciangco	Jess	San Jose		jess.tanciangco@sanjoseca.gov
105	Tom	Vinan	San Jose		
106	Tovar	Melody	San Jose	408-277-3892	melody.tovar@sanjoseca.gov
107	Tsao	Danny	San Jose	408-535-8422	danny.tsao@sanjoseca.gov
108	Wilson	Jim	San Jose	408-535-8441	jim.wilson@sanjoseca.gov

"Complying with New Stormwater Requirements for New and Redevelopment Projects"

	Last	First	Speakers	Phone	Email
1	Bicknell	Jill	SCVURPPP	408-720-8822	jcbicknell@eoainc.com
2	Campbell	Mike	HMH		mcampbell@hmhca.com
3	Buck	Jonathan	ENGEO		jbuck@engeo.com
4	David	Nicole	San Francisco Estuary Institute		nicoled@sfei.org
5	Teresi	Joe	Palo Alto		joe.teresi@CityofPaloAlto.org
6	Wilson	Bill	Carlile Macy		billwilsonwater@gmail.com
7	Sutton	Sarah	Design, Community & Environment		sarah@dceplanning.com
8	Martin	Jane	PlantSF		janemartin@shiftdesignstudio.com
9	Jensen	Carrie	H.T. Harvey Associates		cjensen@harveyecology.com
10	Rock	Glenn	San Jose		Glenn.Rock@sanjoseca.gov
11	Nguyen	Jacob	BFK Engineers		jnguyen@bkf.com
12	Linebarger	Forrest	Vox Design Group		Forrest@voxdesigngroup.com
13	Seeds	Gail	Cupertino		GailS@cupertino.org
	Last	**First**	**Staff**	**Phone**	**Email**
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2	Atre	Vishakha	SCVURPPP	408-720-8811	vatre@eoainc.com
3	Prickett	Laura	SCVURPPP		
	Last	**First**	**Vendors**	**Phone**	**Email**
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2	Bauden	Nicholas	Pacific Interlock Pavingstone		
3	Kruger	Curt	CONTECH Stormwater Solutions	415-897-8587	krugerc@contech-cpi.com
4	Lillo	Sue	Kristar		slillo@kristar.com
5	Demarest	Chris	Filterra Bioretention Systems	925-667-7100	Chris.demarest@comcast.net

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Evaluation Form
Summary

"Complying with New Stormwater Requirements for New and Redevelopment Projects"

Quinlan Community Center, Cupertino, CA -- Tuesday, June 8, 2010

Attendees: 108 **Evaluations: 65**

1. **What's New in Stormwater Regulations? Challenges for Municipalities and the Development Community** – Given by Jill Bicknell, *SCVURPPP*

   Very Useful 53 **Somewhat Useful 10** **Not useful 0**

   - This is always the most important part of the annual workshop.
   - Great comprehensive view of new regulations.
   - Thank you for the comparison between the C6 of MRP and the CGP.
   - Material is very dry.
   - Could have used more time on the subject – a lot of useful information.
   - I always learn something new from Jill.

2. **Overcoming Obstacles to LID Implementation – Tales from Silicon Valley** – Given by Mike Campbell, *HMH*

   Very Useful 40 **Somewhat Useful 22** **Not useful 0**

   - Good guidance for designers.
   - Potential solutions for different site constraints – this can help with multiple project types.

3. **Serramonte Library/Gellert Park Parking Lot – "Green Streets" Demonstration Project** – Given by Jonathan Buck, *ENGEO*

   Very Useful 38 **Somewhat Useful 26** **Not useful 0**

   - Retrofits of existing sites are useful to understand – potential use for regional treatment? Good info on the classification of the project (contractor interpretation of project type and how to advertise for more bid responses).
   - Good practical advice.

4. **Green Infill for Clean Stormwater** – Given by Nicole David, *San Francisco Estuary Institute*

   Very Useful 30 **Somewhat Useful 26** **Not useful 1**

   - Knowledgeable speaker, great data.
   - Good to see quantified results.
   - Great to see results of effectiveness of stormwater facilities.
   - Good to have numbers to back up a project.
   - Too much biological information – some information is needed showing data of pre and post project contaminants, which Nicole did provide.
   - Good information, but a little too technical for this audience.

5. **Stevens Creek Corridor Park and Restoration Project –** Given by Gail Seeds, *Cupertino*

Very Useful 37 **Somewhat Useful 24** **Not useful 1**

- Interesting and relevant project.
- Super project.
- Great project! The improvements were interesting – however, a little more detail of the design elements would also be quite useful.
- What an amazing site makeover, very inspirational.
- Beautiful creek presentation project.
- Great example of restoration.

6. **Mitchell Park Library & Community Center –** Given by Joe Teresi, *Palo Alto*

Very Useful 32 **Somewhat Useful 31** **Not useful 1**

- Interesting components.
- If anything happens through construction completion (i.e., lessons learned) would be nice to hear at a later workshop.
- Would like to see installed projects to get a better understanding of successes.
- What is the post construction information – how are various LID measures performing?

7. **Happy Hollow Park and Zoo –** Given by Glenn Rock, *San Jose*

Very Useful 17 **Somewhat Useful 40** **Not useful 6**

- Great presenter and presentation.
- Not enough specifics
- Info on cross sections?
- Good pictures. The swale bottom solution (spiral swale) would be nice to hear about later.

8. **VMware Headquarters Building–** Given by Jacob Nguyen, *BFK Engineers*

Very Useful 33 **Somewhat Useful 27** **Not useful 1**

- Interesting to see how these BMPs/site design retrofitted into an existing site.

9. **The Self-Watering House –** Given by Forrest Linebarger, *Vox Design Group*

Very Useful 27 **Somewhat Useful 28** **Not useful 5**

- Nice to see a small project so successful, very inspirational.
- Makes one think about what can be done at a home. Some of this could also be useful on a small site.

TRACK 1 – HMP 101

1. **Track 1 – HMP 101 Presentations –** Given by Jill Bicknell, *SCVURPPP*

Very Useful 22 **Somewhat Useful 4** **Not useful 0**

- Well organized, clear presentation, good selection of slides.

TRACK 2 – ADVANCED C.3. TOPICS

1. **Integrated Water Harvesting & Watershed-Based Stormwater Planning -** Given by Bill Wilson, *Carlile Macy*

   Very Useful 27 Somewhat Useful 11 Not useful 1

   - Would have liked a more concentrated view. He did not have enough time to present what he wanted to share.
   - Many interesting and innovative examples.
   - Good stories. Any lessons learned? Recommendation for one system over another?
   - Too general – showed examples of his design, but not much detail.

2. **Green Roofs: From Concept to Reality –** Given by Sarah Sutton, *Design, Community & Environment*

   Very Useful 24 Somewhat Useful 14 Not useful 0

   - Too much detail, tried to present her presentation with her original amount of time.
   - Lots of great detailed technical information.
   - Good to understand what goes into a green roof and what should be involved.
   - Needed more attention to sustainability and maintenance.

3. **Double Duty: Working Landscapes for Urban Settings** –Given by Jane Martin, *PlantSF*

   Very Useful 18 Somewhat Useful 13 Not useful 2

   - Good information, but didn't know target audience.
   - She is a great person for the community and helping neighbors get involved.
   - Interesting but not particularly applicable to Santa Clara Valley.
   - Love the retrofit-type projects! Analyzing what can be tracked into small spaces.
   - Needs to be more familiar with local Santa Clara County conditions.
   - The before and after photos were excellent.
   - Good number of pictures helped to explain her project.

4. **San Jose Sidewalk Landscaping: Site #1** –Given by Carrie Jensen, *H. T. Harvey Associates*

   Very Useful 18 Somewhat Useful 13 Not useful 5

   - Perfect last presenter – nice energy.
   - Fun, human-interest story.
   - The tip on planting a plus (planting something to break up the soil before planting "real" plants).
   - Interesting approach and some good ideas.
   - A light example of what a homeowner can do.

GENERAL COMMENTS

Did this workshop meet your expectations? Yes: 56 No: 1

- Got updates on new permits, and other ideas for site design/ BMPs and other potential ways to incorporate stormwater design into a site.
- Had expected more useful information on rainwater harvesting – cisterns – how to size, etc.
- Came to see Bay Friendly Landscaping - Please post a copy of the Bay Friendly Landscaping presentation online.

What parts of the workshop were most useful to you?

- Updates on MRP and general permit, examples of LID application.
- Lots of great case studies, lessons learned.
- Good background information for those new to this topic.
- Examples and thorough explanation about the topics were discussed.
- Review of regulations and HMP 101.
- Great workshop overall – I know lots of folks are annoyed with the new permit but it makes trainings like this one much more interesting.
- Green roof, SFEI test results, regulatory overview.
- Advanced topics.
- Jill's updates and changes to MRP, actual case studies of projects that worked.

What would have made this workshop more useful?

- More time for questions and answers.
- Better time management to allow case studies to be better explained.
- Some topics (HMP, LID) could be expanded on – possibly make the "annual" training a 2-day workshop with more specific topics explored.
- More short breaks – to stretch, get coffee, etc.
- Give presenters a realistic time – many presentations felt rushed.
- The video image and pointer system could work better to help with understanding the lecture.
- The morning sessions were more applicable to stormwater management – the afternoon sessions tended to be more specialized and therefore tended to be less useful if not applicable to one's area of work/interest.

What topics would you recommend for a future workshop?

- C.6. Workshop.
- Low cost measures to use given budget constraints.
- Case studies of retrofits.
- Opportunities for grant funding and/or partnerships.
- BAHM training.
- Practice design in urban areas – give a standard – streetscape and design landscaped areas like Jane and Carrie.
- Topics in Track 2 could be more interesting if time permits.
- Implementation of LID.
- Lessons learned (for more constructed projects) and how these unexpected conditions were retrofitted. Cost of BMPs (are they in line with info you find on-line?).

General Comments?

- Try to avoid vendors or venues that still use Styrofoam coffee cups.
- Great workshop all around.
- Please give presenters enough time – breaks are necessary.
- Best workshop over past several years on C.3 issues.
- Need a better laser pointer – it was very difficult to see where the presenter was pointing on the slides.
- Great venue – comfortable, good acoustics, and central.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 6-1

Construction - related Workshop Information – FY09-10

- "Construction Site Inspection Training" Workshop – October 21, 2009
  - Workshop Announcement
  - Workshop Agenda
  - Attendance List
  - Workshop Evaluations Responses
- "Construction Stormwater Management Compliance Workshop" – January 19 and 20, 2010
  - Workshop Announcement
  - Workshop Agenda
  - Attendance List
  - Workshop Evaluations Responses
- "Construction Site Stormwater Compliance Workshop" – May 19, 2010
  - Workshop Announcement
  - Workshop Agenda
  - Attendance List
  - Workshop Evaluations Responses

Construction Site Inspection Training

October 21, 2009

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Presents

"Construction Site Inspection Training"

Wednesday, October 21, 2009
9:00 am – 12 noon
Roosevelt Community Center
901 E Santa Clara St
San Jose, CA 95116

Wednesday, October 21, 2009
1:00pm – 4:00 pm
Roosevelt Community Center
901 E Santa Clara St
San Jose, CA 95116

The same training will be offered in both sessions

Who should attend: This workshop is primarily for municipal inspectors who perform stormwater inspections of construction sites for their agency's stormwater program; staff responsible for public construction projects and local stormwater program coordinators are also welcome.

Workshop agenda will include information on: Current construction site regulations & responsibilities; effective erosion and sediment control BMPs, inspection procedures.

Workshop Benefits: Acquire or refresh your knowledge of current permit requirements; effective BMPs for your construction projects; inspection and enforcement procedures; and construction site management approaches to stay in compliance.

*There will be **no charge** to agency staff for the workshop. Refreshments will be served.*
Please pass this flyer to appropriate staff within your organization.

REGISTRATION FORM (Please indicate the session you would like to attend)

Name: _____

Title: _____

Agency/Company: _____

Phone: _____

Email: _____

☐ **Morning (9:00 am – 12:00 noon)**

☐ **Afternoon (1:00 pm – 4:00 pm)**

Please complete and email to vatre@eoainc.com or fax to the Santa Clara Valley Urban Runoff Program office (fax no. 408- 720-8812) no later than Monday, October 19, 2009. Questions? Call Vishakha Atre at 408-720-8811

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

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

CONSTRUCTION SITE INSPECTION TRAINING

Wednesday, October 21, 2009
9:00 AM – 12:00 PM

Roosevelt Community Center
901 E Santa Clara St, San Jose, CA 95116

WORKSHOP AGENDA

8:30 AM	Registration and Refreshments	
9:00 AM	Welcome and Introduction	Jill Bicknell *SCVURPPP*
9:10 AM	Construction Site Inspection and Enforcement Procedures	Cathy Hoang-Mendoza *San Jose*
9:40 AM	Stormwater Quality – Construction Site Compliance/Controls	Scott Taylor *RBF Consulting*
10:30 AM	Break	
10:45 AM	Stormwater Quality – Construction Site Compliance/Controls	Scott Taylor *RBF Consulting*
11:30 AM	Check-in with Water Board Construction Inspection Team	Christine Boschen *SF Bay Regional Water Quality Control Board*
12:00 PM	Adjourn	

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

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

CONSTRUCTION SITE INSPECTION TRAINING

Wednesday, October 21, 2009
1:00 PM – 4:00 PM

Roosevelt Community Center
901 E Santa Clara St, San Jose, CA 95116

WORKSHOP AGENDA

12:45 PM	Registration	
1:00 PM	Welcome and Introduction	Kristin Kerr *SCVURPPP*
1:10 PM	Check-in with Water Board Construction Inspection Team	Christine Boschen *SF Bay Regional Water Quality Control Board*
1:40 PM	Construction Site Inspection and Enforcement Procedures	Cathy Hoang-Mendoza *San Jose*
2:10 AM	Stormwater Quality – Construction Site Compliance/Controls	Scott Taylor *RBF Consulting*
3:00 PM	Break	
3:15 PM	Stormwater Quality – Construction Site Compliance/Controls	Scott Taylor *RBF Consulting*
4:00 PM	Adjourn	

SCVURPPP Construction Site Inspection Training
Morning Session: Attendance List
Roosevelt Community Center, San Jose

	Last Name	First Name	Agency
1	Acimento	Armand	City of San Jose
2	Alao	Scott	SCVWD
3	Alarcon	Mauro	City of San Jose
4	Alba	Roy	Town of Los Gatos
5	Anderson	Eric	City of Mountain View
6	Anderson	Jerry	Santa Clara County Parks and Rec.
7	Arevalo	Luis	City of San Jose
8	Arnold	Scott	City of San Jose
9	Avalos	Jaime	City of San Jose
10	Barnese	Vince	City of San Jose
11	Bashaw	Darin	City of Santa Clara
12	Blancher	Gordon	City of Sunnyvale
13	Borrew	Juan	City of San Jose
14	Brown	Brian	City of Mountain View
15	Buchanan	Nick	City of San Jose
16	Calhoun	Brett	SCVWD
17	Campbell	Mike	HMH
18	Castro	Ray	City of San Jose - Public Works
19	Chitwood	Ron	Santa Clara County
20	Colosky	Mike	City of San Jose
21	Curren	Tom	City of San Jose
22	De Castro	Fidel	City of San Jose
23	Decroix	Mike	City of San Jose
24	Dhillon	Harparilash	City of San Jose
25	Donohoe	Tim	City of San Jose
26	Ellenberger	Ted	County of Santa Clara - West Yard

SCVURPPP Construction Site Inspection Training
Morning Session: Attendance List
Roosevelt Community Center, San Jose

	Last Name	First Name	Agency
27	Fujimoto	Christopher	City Palo Alto
28	Ghofraniha	Bahar	City of San Jose
29	Guevara	Jerry	Santa Clara County
30	Halleck	Bill	City of San Jose
31	Hansen	Patrick	City of San Jose
32	Harrison	Ryan	City of San Jose
33	Hernandez	Jamie	City of San Jose
34	Hom	Alan	City of Campbell
35	Hughes	Don	Santa Clara County
36	Jackson	Kort	City of San Jose
37	Johnson	Michael	City of San Jose
38	Jones	Arion	City of San Jose Public Works
39	Kazemi	Jamal	City of San Jose
40	Kloster	Ted	Santa Clara County Parks and Rec.
41	Lake	David	Santa Clara Co. Parks
42	Lawrence	Greg	City of San Jose
43	Le	Alan	HMH
44	Macatiag	Angel	SCC
45	McCarthy	Joe	City of San Jose
46	McNitzky	Nina	City of San Jose
47	Mendes	Jeff	County of Santa Clara
48	Mendoza	Jose	City of San Jose
49	Miller	Craig	City of Santa Clara
50	Morse	Mary	City of San Jose
51	Nascimento	Armand	City of San Jose
52	Nguyen	Ted	County of Santa Clara

SCVURPPP Construction Site Inspection Training
Morning Session: Attendance List
Roosevelt Community Center, San Jose

	Last Name	First Name	Agency
53	Palajac	Jan	City of San Jose
54	Patterson	John	Santa Clara County Parks and Rec.
55	Perez	Ubaldo	County Parks
56	Rivero	Raul	City of San Jose
57	Romeo	Antoinette	SCC
58	Ruiz	Hipolito	City of San Jose
59	Ryan	Elish	Santa Clara County Parks Department
60	Sanchez	Anthony	Santa Clara County Parks and Rec.
61	Santiago	George	Santa Clara County Parks and Rec.
62	Sarmiento	Arnold	SCVWD
63	Schramm	Jim	Santa Clara County - Roads & Airports
64	Siordia	Jessie	City of San Jose
65	Stanton	David	HMH
66	Tarazon	Lisa	City of San Jose
67	Teixeira	Henry	Santa Clara County Parks Department
68	Territo	Chuck	City of San Jose
69	Thompson	Mitchell	Santa Clara County
70	Tott	Bill	City of Santa Clara
71	Viray	Jun	City of San Jose
72	Vo	Khoa	Santa Clara County Roads & Airports
73	Welch	Tom	City of San Jose
74	Zatkin	Gary	City of San Jose

SCVURPPP Construction Site Inspection Training

Afternoon Session: Attendance List

Roosevelt Community Center, San Jose

	Last Name	First Name	Agency
1	Alao	Bryan	City of San Jose
2	Assaf	Mohamed	County of Santa Clara
3	Avalos	Jose	City of San Jose
4	Baggese	David	City of San Jose
5	Britton	Jeffrey	City of Santa Clara
6	Carroon	Adelmo	City of San Jose
7	Clemmons	Deriek	City of San Jose
8	Dowgialo	Jim	City of San Jose
9	Duffy	Michael	City of San Jose
10	Erkel	Brent	City of San Jose
11	Fossati	Michael	City of Saratoga
12	Frederick	Mark	Santa Clara County Parks
13	Glendinning	Mark	Town of Los Gatos
14	Harrison	Jay	City of Santa Clara
15	Harrison	Michael	County of Santa Clara
16	Hart	Jared	City of San Jose
17	Hernandez	Chris	City of San Jose
18	Ho	Kevin	City of San Jose
19	Hoang-Mendoza	Cathy	City of San Jose
20	Ingebrigtsen	Tracy	Stanford University
21	Johnson	Susan	City of San Jose
22	Kanemoto	Keith	City of San Jose
23	Lacy	Susan	City of San Jose
24	Mark	Jane	Santa Clara County Parks
25	Mason	Tami	City of San Jose
26	Moreno	Frank	City of San Jose

SCVURPPP Construction Site Inspection Training

Afternoon Session: Attendance List

Roosevelt Community Center, San Jose

	Last Name	First Name	Agency
27	Munoz	Art	City of San Jose
28	Newton	Matt	City of San Jose
29	Nichols	Allen	City of San Jose
30	Nolte	Derek	City of Mountain View
31	Osborn	Steve	City of San Jose
32	Page	Les	City of San Jose
33	Prince	Donella	City of San Jose
34	Reynolds	Keith	SCVWD
35	Rodriguez	Ralph	City of San Jose
36	Ryan	Elish	Santa Clara County Parks
37	Sandahl	Carrie	Mountain View
38	Sedaghatpour	Shara	City of San Jose
39	Soltero	Paul	City of San Jose
40	Souza	Steve	Town of Los Gatos
41	Wahidi	Syed	City of Campbell
42	Welch	Tom	City of San Jose
43	Woodard	Denise	City of San Jose

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Evaluation Form
Summary

CONSTRUCTION SITE INSPECTION TRAINING
Roosevelt Community Center, San Jose
Wednesday, October 21, 2009
9:00 AM – 12:00 noon

Attendees: 74 **Evaluations: 39**

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1. **Construction Site Inspection and Enforcement Procedures –** Given by Cathy Hoang-Mendoza, City of San Jose

   Very Useful 28 **Somewhat Useful 10** **Not useful 1**

   Comments:

   - Appreciate the practical examples.
   - Esp. good as substitute.
   - Good notes/pictures.
   - Cathy's presentation was great!
   - Not with a city (Not Useful)
   - Refresh city municipal-code.
   - I'm not sure how useful this information is to people from other jurisdictions who attended.

2. **Stormwater Quality – Construction Site Compliance/Controls -** Given by Scott Taylor, RBF Consulting

   Very Useful 30 **Somewhat Useful 7** **Not useful 0**

   Comments:

   - Very informative and a good heads up for what is coming.
   - Appreciate the practical examples.
   - Extremely qualified, good presentation.
   - Always great presentations.
   - Photo slides were helpful to help understand different BMPs.
   - Deeply knowledgeable.
   - One of the most knowledgeable people in the field and a good speaker.

3. **Check-in with Water Board Construction Inspection Team -** Given by Christine Boschen, SF Bay Regional Water Quality Control Board

   Very Useful 19 **Somewhat Useful 11** **Not useful 0**

   Comments:

- Interesting to see what the state considers a "violation"
- Knowledgeable/practical.
- Does not explain enough.
- It is good to know what the Board looks for and how strict they are.
- Pictures of violations give good idea of what Board is looking for – good insight into their philosophy.

Did this training meet your expectations? Yes: 38 No: 0

Comments:

- Always good to hear new ideas and products.

What parts of the training were most useful to you?

- Costs of EC measures and products.
- Photos of violations. Heads up on new GOP requirements.
- Procedures.
- Stormwater quality.
- All of them, but in particular, the City of San Jose presentation.
- Who is responsible for what activities.
- Photos. (2)
- Better management practices.
- Site containment.
- Construction site BMPs.
- BMPs. (2)
- Filter fabric should not be used during rain seasons.
- Examples.
- Method of control.
- Visual examples.
- All. (4)
- Keep refreshers coming and with some new info as available, we need the consistency and updates, esp. if we do not match these all the time (or if we do…)
- Example photos.
- Storm water quality notes and pictures.
- Best management practices. Best available technology.
- This is the most educated AND field educated group of speakers – I'm used to listening to people in their heads without field experience or that rare uncommon "common sense".
- Photo examples and some discussions of permit change for July 2010.
- Visual examples – right vs. wrong way to do it.
- Erosion control measures and examples of problems.
- Example (slides) of "Do's" and "Don'ts".
- Applicable examples in photographs with discussion of practices.
- Knowing what the water board is looking at.
- Recent examples/cases.
- Water Board presentation.

What would have made this training more useful?

- Better quality presentation from Regional Board – less repetitive, more informational regarding Board operations, regulations, etc.
- More handouts.
- Better explanation of upcoming permit requirements.
- Flow charts of responsibility.
- More time. (2)
- Information for prevention/implementation.
- Movies.
- Leave some type of org chart or chain of command and phone numbers to contact.
- More coffee.
- More time with the RWQCB rep.
- Can we have a class for inspectors only?
- Nothing.
- Show how these regulations can be monitored.
- Define acronyms – list on handout. List all websites on a single sheet/handout.
- Copy of BMP handbook.
- Starting on time.
- More examples/cases to review. Good vs. bad as class examples.
- If it can be geared to utility work in Public Right of Way

What topics would you recommend for a future training?

- New Permit. (2)
- How to take digital photos for best investigations.
- Encourage city staff to make habit to keep work site neat and clean/work with construction team.
- Demonstrations and examples.
- Utilities companies involved in construction.
- Negative aspects of over hill or erosion and sediment controls. E-training – do at own pace.
- Erosion control for utility permitted jobs/projects.
- Topics for enforcement were well covered.
- Storm water control on unregulated sites, i.e., Farms, Foothills, Construction Yards, to name a few.
- Case studies.
- Example of citing locally with steps of remediation by local agency and water board collaborating.
- Class exercise/group project planning exercise.
- Requirements of new construction permit and new MRP.

General Comments?

- Need a little more time.
- Good job.
- Great refresher, a must.
- Thank You. (4)

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Evaluation Form Summary

CONSTRUCTION SITE INSPECTION TRAINING
Roosevelt Community Center, San Jose
Wednesday, October 21, 2009

Attendees: 43 **Evaluations: 24**

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1. **Check-in with Water Board Construction Inspection Team -** Given by Christine Boschen, SF Bay Regional Water Quality Control Board

   Very Useful 7 **Somewhat Useful 16** **Not useful 1**

Comments:

- Photos showed various violations but effect on environment not addressed and no consideration of effects of natural erosion vs. human causes.
- Pretty brief – would be helpful to have a little more time.
- Give more detail of the damage the creeks & bay has occurred due to violations.

2. **Construction Site Inspection and Enforcement Procedures –** Given by Cathy Hoang-Mendoza, City of San Jose

   Very Useful 7 **Somewhat Useful 14** **Not useful 2**

Comments:

- As a county agency, not so useful to us.
-

3. **Stormwater Quality – Construction Site Compliance/Controls -** Given by Scott Taylor, RBF Consulting

   Very Useful 17 **Somewhat Useful 6** **Not useful 0**

Comments:

- When considering types of erosion control, presented as if we had to decide what should be used. We are only inspectors, not to dictate what is used. Responsibility of property developer – City properties decided by higher ups.
- Most informative presentation – appreciate examples of real world construction problems and discussion (re: different BMP techniques).

- Who are you talking about? That needs to do the inspections? Contractors or CSJ Inspectors???

Did this training meet your expectations? Yes: 18 No: 1

Comments:

- Somewhat
- This should have been more specific to what we as inspectors for the City of San Jose are required to do – not what other entities are required to do.

What parts of the training were most useful to you?

- Examine if procedures used by developers are adequate. Cost of different products not our concern.
- Scott Taylor's presentation was excellent and look forward to attending his overview of the new 2009 General Permit. (Note: presentations with examples of bad practices should include examples how situations could be handled better.)
- Section 3 – I liked the ½ day.
- Enforcement procedures.
- Scott Taylor's talk.
- Scott's presentation is practical and although I've seen these measures before, it's good to be reminded.
- BMPs.
- Contacts that are available if violations exists.
- SWPPP requirements.
- Refresh info and update of new requirements coming.
- 2 and 3.
- All.
- The parts that were addressed to contractors and developers.
- Examples of what to do.

What would have made this training more useful?

- Morning training, not pm. (3)
- Be more specific for City of San Jose inspectors. Coffee and tea and water would have been nice. Not everyone drinks soda.
- More examples of what are the acceptable practices. Examples of fines given to contractors.

What topics would you recommend for a future training?

- New Permit requirements.
- Discuss specific responsibilities of inspection staff under the new Municipal Regional Permit. Contrast between current policy and upcoming policy.
- Contact phone numbers.
- Be more specific for CSJ inspectors. Who are you speaking to?
- Update the photo library. Some photos seen a few times.

General Comments?

- Dry

Construction Stormwater Management Compliance Workshop

January 19 and 20, 2010

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

"Construction Stormwater Management Compliance Workshop"

Tuesday, January 19, 2010
8:30 am – 3:30 pm
Quinlan Community Center
10185 N. Stelling Road
Cupertino. CA 95014

Wednesday, January 20, 2010
8:30 am – 3:30 pm
Roosevelt Community Center
901 E. Santa Clara St.
San Jose, CA 95116

Same Workshop Will Be Offered On Both Days

Who should attend this workshop: Municipal inspectors who perform stormwater inspections for their agency's stormwater program; staff responsible for public construction projects; local stormwater program coordinators. **Contractors and others interested in attending are requested to sign up for the workshop at http://www.sfestuary.org/projects/detail.php?projectID=7**

Workshop agenda will include information on:

- How to comply with the New Statewide Construction General Permit
- Simple and effective stormwater BMPs (Best Management Practices) for small and large construction projects
- Selecting and maintaining BMPs during construction
- Monitoring and reporting requirements
- Post construction stormwater management techniques

*There will be **no charge** to municipal staff for the workshop. Breakfast & box lunch will be served.*
Please pass this flyer to appropriate staff within your organization.

REGISTRATION FORM (Please indicate the date you would like to attend)

Name: _____

Title: _____

Agency/Company: _____

Phone: _____

Email: _____

☐ **Tuesday, Jan 19, Cupertino Location**

☐ **Wednesday, Jan 20, San Jose Location**

Please complete and email to Miranda@eoainc.com or fax to the Santa Clara Valley Urban Runoff Program office (fax no. 408- 720-8812) no later than Wednesday, January 13, 2010 . Questions? Call Miranda at 408-720-8811

Construction Site Compliance Workshop
January 19th, 2010

Quinlan Community Center
10185 N. Stelling Road
Cupertino, CA 95014

AGENDA

8:30 AM	**Registration and Continental Breakfast**
9:00 AM	**Welcome and Introduction** Debbi Egter Van Wissekerke, San Francisco Estuary Project
9:05 AM	**The Municipal Regional Permit (MRP) – What You Need to Know** Jill Bicknell, Kristin Kerr, SCVURPPP
9:30 AM	**Understanding the New State General Construction Permit** Scott Taylor, RBF Consulting
10:30 AM	**BREAK**
10:45 AM	**The Water Board Inspection Program in Santa Clara County** Christine Boschen, San Francisco Regional Water Quality Control Board
11:15 AM	**Storm Water Pollution Prevention Programs, State and Municipal Requirements, Compliance** Scott Taylor, RBF Consulting
11:45 AM	**Lunch** (To be provided)
12:30 PM	**Linear Utility Projects – Overview** Tanya Bilezikjian, RBF Consulting
12:50 PM	**Sediment, Erosion Control and Construction Site Pollution Prevention** Scott Taylor, RBF Consulting
1:20 PM	**Vendor Demonstration**
1:40 PM	**Sediment, Erosion Control and Construction Site Pollution Prevention** Scott Taylor, RBF Consulting
2:10 PM	**Group Exercise – Developing a SWPPP Site Map and Erosion Control Plan**
3:45 PM	**Adjourn**

Construction Site Compliance Workshop
January 20th, 2010

Roosevelt Community Center
901 E Santa Clara St
San Jose, CA 95116

AGENDA

8:30 AM **Registration and Continental Breakfast**

9:00 AM **Welcome and Introduction**
Debbi Egter Van Wissekerke, San Francisco Estuary Project

9:05 AM **The Municipal Regional Permit (MRP) – What You Need to Know**
Jill Bicknell, Kristin Kerr, SCVURPPP

9:30 AM **Understanding the New State General Construction Permit**
Scott Taylor, RBF Consulting

10:30 AM **BREAK**

10:45 AM **The Water Board Inspection Program in Santa Clara County**
Christine Boschen, San Francisco Regional Water Quality Control Board

11:15 AM **Storm Water Pollution Prevention Programs, State and Municipal Requirements, Compliance**
Scott Taylor, RBF Consulting

11:45 AM **Lunch** (To be provided)

12:30 PM **Linear Utility Projects – Overview**
Tanya Bilezikjian, RBF Consulting

12:50 PM **Sediment, Erosion Control and Construction Site Pollution Prevention**
Scott Taylor, RBF Consulting

1:20 PM **Vendor Demonstration**

1:40 PM **Sediment, Erosion Control and Construction Site Pollution Prevention**
Scott Taylor, RBF Consulting

2:10 PM **Group Exercise – Developing a SWPPP Site Map and Erosion Control Plan**

3:45 PM **Adjourn**

Construction Stormwater Management Compliance Workshop
Sign In Sheet

	Last Name	First Name	Municpal	Initials
1	Barragan	Manuel	Cupertino	
2	Donnelly	Cheri	Cupertino	
3	Rieden	Kevin	Cupertino	
4	Greiner	Terry	Los Altos	
5	Small	Kathy	Los Altos	
6	Bermudez	Jorge	Milpitas	
7	Bravo	Fernando	Milpitas	
8	Dutton	Jim	Milpitas	
9	Hanson	William	Milpitas	
10	Kaderi	Babak	Milpitas	
11	Leung	Jeff	Milpitas	
12	Phalen	Kathleen	Milpitas	
13	Racca-Johnson	Elizabeth	Milpitas	
14	Uppal	Paramjit	Milpitas	
15	Waldron	Julie	Milpitas	
16	Anderson	Eric	Mountain View	
17	Nolte	Derek	Mountain View	
18	Sandahl	Carrie	Mountain View	
19	Boyd	Holly	Palo Alto	
20	Fujimoto	Chris	Palo Alto	
21	Hara	Robert	Palo Alto	
22	Jones	Brian	Palo Alto	
23	Nafziger	Mike	Palo Alto	
24	Tran	Young	Palo Alto	
25	Hoang-Mendoza	Cathy	San Jose	
26	Sabour	Fred	San Jose	
27	Thakare	Pradnya	San Jose	
28	Wilson	Jim	San Jose	
29	Staub	David	Santa Clara	
30	Wier	Elliot	Santa Clara	
31	Brosseau	Kim	Santa Clara County	
32	Caceres	Bernardine	Santa Clara County	
33	Cline	Tracy	Santa Clara County	
34	Cruz	Pete	Santa Clara County	
35	Dalal	Rikti	Santa Clara County	
36	Duazo	Ed	Santa Clara County	
37	Freitas	Chris	Santa Clara County	
38	Gangadhara	Hosalli	Santa Clara County	
39	Klett	Kelly	Santa Clara County	
40	Leung	Joseph	Santa Clara County	
41	Mahdavi	Faranak	Santa Clara County	
42	Melvin	David	Santa Clara County	
43	Parks	David	Santa Clara County	
44	Rivas	Manuel	Santa Clara County	
45	Romeo	Antoninette	Santa Clara County	
46	Roncal	Barni	Santa Clara County	
47	Shoffner	Dawn-Marie	Santa Clara County	
48	Spaulding	Clara	Santa Clara County	
49	Vo	Khoa	Santa Clara County	
50	Wong	Darrell	Santa Clara County	

January 19, 2010

Construction Stormwater Management Compliance Workshop
Sign In Sheet

	Last Name	First Name	Municpal	Initials
51	Yang	Jim	Santa Clara County	
52	Mark	Jane	Santa Clara County Parks	
53	Rocha	Don	Santa Clara County Parks	
54	Wang	James	SCVWD	
55	Ankeny	Randy	Sunnyvale	
56	Blancher	Gordon	Sunnyvale	
57	Fernandez	Toby	Sunnyvale	
58	Gonzales	Eric	Sunnyvale	
59	McCumby	Kristy	Sunnyvale	
60	Perking	Diana	Sunnyvale	
61	Serrano	Bob	Sunnyvale	
62	Stevenson	Daniel	Sunnyvale	
63	Bristow	Mark	West Valley Sanitation District	
64	Hatchett	Kelvin	West Valley Sanitation District	
65	Torres	Jess	West Valley Sanitation District	
66	Bicknell	Jill	SCVURPPP	Speaker
67	Bilezikjian	Tanya	RBF Consulting	Speaker
68	Boschen	Christine	SFRWQCB	Speaker
69	Taylor	Scott	RBF Consulting	Speaker
70	Atre	Vishakha	SCVURPPP	Staff
71	EgterVanWissekerke	Debbi	SFEP	Staff
72	Banks	Sterling	Rain For Rent	Vendor
73	Cazarez	Pablo	Rain For Rent	Vendor
74	Graham	Doug	Profile Products	Vendor
75	Hammer	Kristina	Rain For Rent	Vendor
76	Smith	Zachary	Rain For Rent	Vendor

Construction Stormwater Management Compliance Workshop
Sign In Sheet

	Last Name	First Name	Municpal	Initials
1	Huynh	David	Atherton	
2	Hom	Alan	Campbell	
3	Oxonian	Alberto	Campbell	
4	Apilado	Emil	Los Altos	
5	Bocalan	Michelle	Los Altos	
6	Fairman	Aida	Los Altos	
7	Harper	Robert	Los Gatos	
8	Boitnott	Michael	Milpitas	
9	Ezeokeke	Joe	Milpitas	
10	Heydari	Fariborz	Milpitas	
11	Nguyen	Jimmy	Milpitas	
12	Wiseman	Dorsey	Milpitas	
13	Yee	Poh	Milpitas	
14	Amores	Jim	Palo Alto	
15	Anderson	Daren	Palo Alto	
16	Arp	Ron	Palo Alto	
17	Bicknell	Richard	Palo Alto	
18	Carlet	Shari	Palo Alto	
19	Collie	Joe	Palo Alto	
20	Kim	Jay	Palo Alto	
21	Muir	Chuck	Palo Alto	
22	Nguyen	Hung	Palo Alto	
23	Perez	Guiselle	Palo Alto	
24	Torke	Ken	Palo Alto	
25	Roche	Anna	San Francisco Public Utilities Commission	
26	Weinand	Matthew	San Francisco Public Utilities Commission	
27	Murray	Kevin	San Francisquito Creek Joint Powers Authority	
28	Tsao	Danny	San Jose	
29	Aguilar	Mirabel	San Jose	
30	Aizumi	Susan	San Jose	
31	Alvarez	Adolfo	San Jose	
32	Angeles	Maria	San Jose	
33	Avalos	Jaime	San Jose	
34	Balingit	Jose	San Jose	
35	Banwait	Manjit	San Jose	
36	Barnese	Vince	San Jose	
37	Bhatnager	Suchet	San Jose	
38	Blum	Steve	San Jose	
39	Cheung	Ron	San Jose	
40	Croutch	Ellen	San Jose	
41	Grogan	Dale	San Jose	
42	Halleck	Bill	San Jose	
43	Hansen	Patrick	San Jose	
44	Harrison	Ryan	San Jose	
45	Hart	Jared	San Jose	
46	Johnson	Michael	San Jose	
47	Kumar	Sal	San Jose	
48	Loatfi	Morgan	San Jose	
49	Mastrodicasa	Chris	San Jose	
50	Morse	Mary	San Jose	
51	Mu	Huimin	San Jose	

Construction Stormwater Management Compliance Workshop
Sign In Sheet

	Last Name	First Name	Municpal	Initials
52	Nakagawara	Arlene	San Jose	
53	Palajac	Jan	San Jose	
54	Palomar	Stacey	San Jose	
55	Pruitt	Mike	San Jose	
56	Rapson	Rodney	San Jose	
57	Rivero	Raul	San Jose	
58	Rundle	Loren	San Jose	
59	Sawicki	Patty	San Jose	
60	Trinidad	Domingo	San Jose	
61	Valdes	Ricardo	San Jose	
62	Wilder	Gabrielle	San Jose	
63	Rodriguez	Ralph	San Jose	
64	Kazemi	Jamal	San Jose	
65	William	Yvonne	San Jose	
66	Smith	Al	San Jose	
67	Assaf	Mohamed	Santa Clara County	
68	Burke	Deborah	Santa Clara County	
69	Chitwood	Ron	Santa Clara County	
70	Contreras	Angelina	Santa Clara County	
71	Fong	Ryan	Santa Clara County	
72	Ho	Tran	Santa Clara County	
73	Hong	Tong	Santa Clara County	
74	Ikeda	Jim	Santa Clara County	
75	Li	Christine	Santa Clara County	
76	Nguyen	Ted	Santa Clara County	
77	Ojeda	Nolverto	Santa Clara County	
78	Patterson	John	Santa Clara County	
79	Phillips	Susan	Santa Clara County	
80	Pipkin	Rowdy	Santa Clara County	
81	Parks	David	Santa Clara County	
82	Schramm	Jim	Santa Clara County	
83	Shallenberger	Lincoln	Santa Clara County	
84	Stutz	Greg	Santa Clara County	
85	Theis	Shelly	Santa Clara County	
86	Trinh	Mai	Santa Clara County	
87	Tucker	Charles	Santa Clara County	
88	Pascoal	Paul	Santa Clara County	
89	Petersen	Craig	Santa Clara County	
90	Halepeska	Rex	Santa Clara County Parks	
91	Dharasker	Shree	SCVWD	
92	Gonzales	Nelson	SCVWD	
93	Mai	Cong	SCVWD	
94	Palafox	Felix	SCVWD	
95	Reynolds	Keith	SCVWD	
96	Ingebrigtsen	Tracy	Stanford University	
97	Kern	Adam	Stanford University	
98	Brown	Alan	Sunnyvale	
99	Chun	Bennett	Sunnyvale	

Construction Stormwater Management Compliance Workshop
Sign In Sheet

	Last Name	First Name	Municpal	Initials
100	Espinoza	Joe	Sunnyvale	
101	Fakih	Nasser	Sunnyvale	
102	Rojas	George	Sunnyvale	
103	Tripiano	Frank	Sunnyvale	
104	Williamson	Josh	Sunnyvale	
105	Carroll	Kelly	West Valley Communities	
106	Picado	Jorge	West Valley Sanitation District	
107	Campbell	Mike	HMH Inc	
108	Weis	Deric	Ruth & Going Inc	
109	Bilezikjian	Tanya	RBF Consulting	Speaker
110	Boschen	Christine	SFRWQCB	Speaker
111	Kerr	Kristin	SCVURPPP	Speaker
112	Taylor	Scott	RBF Consulting	Speaker
113	Atre	Vishakha	SCVURPPP	Staff
114	EgterVanWisseke rke	Debbi	SFEP	Staff
115	Fusco	John	SCVURPPP	Staff
116	Cazarez	Pablo	Rain For Rent	Vendor
117	Graham	Doug	Profile Products	Vendor
118	Hammer	Kristina	Rain For Rent	Vendor
119	Smith	Zachary	Rain For Rent	Vendor

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Construction Site Compliance Evaluation Summary

SAN FRANCISCO ESTUARY PARTNERSHIP

Location: **Quinlan Community Center, Cupertino**
Date: **Tuesday, January 19, 2010**

Attendees: 65 ***Evaluations: 43***

A. OVERALL	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*	**COMMENTS**
1. Room/Facility was pleasant	1	0	2	12	28	• Too cold
2. Materials were useful	1	0	3	14	23	• Some handouts were too small to see
3. Pacing was neither too quick nor to slow	1	1	10	20	9	
4. Content was interesting	1	0	6	24	13	• Some material was a repeat of previous workshops
5. I learned a lot	1	0	7	20	15	• Good slides, very informative

B. INSTRUCTORS						
1. Instructors were knowledgeable	1	0	0	14	27	• Helpful knowledge
2. Instructors answered my questions	1	0	5	15	20	• Good for staff engineers and inspectors
3. Instructors kept me interested	1	1	8	16	16	

C. RESULTS						
1. This course will improve the quality of my work	1	0	7	20	14	
2. I would recommend the course to others	1	1	2	21	17	
3. This training was a worthwhile investment of my time	1	2	4	19	16	

D. The most useful information for me was:

- Information about the new permit requirements
- How to carry out a thorough inspection – knowledge and awareness of new/upcoming regional permits
- Handouts and CD material
- New changes and new requirements in the new permit requirements and the exercise work plan
- Timeline implementation
- All the new requirements and explaining the differences between the MRP and GCP
- Viewing photos of BMP practices, both good and bad implementations
- Contacts for help with implementation
- Application of erosion control measures
- What cities are required to inspect
- Information on turbidity testing

E. **The least useful information for me was:**

- Water Board Inspection Program
- Vendor portion
- Municipal/residential inspections
- Too many details at once
- SWPPP drawing at end
- Redundant info from past 15 years

F. What type of additional information would you like to see presented in the class?

- It should be clarified what agencies are responsible for enforcing if not the owner of a project vs. if they own the project (public works/capital improvement project). Jill's talk should specify who is responsible (agency) & Scott's should say owner/builder is responsible.
- Provide more on biodegradable materials.
- Information for non-city agencies (counties and NPDES/permit requirements in rural, un-residential areas)
- If we could get computers for everyone when running through RL calculations
- Sampling equipment types
- More BMP practices for public-right-of-way facilities
- More practical experience
- Specific local case studies
- NPDES requirements related to parks and trails
- Streamlined forms specific to what the agencies want

G. **Additional Comments**

- This class was very useful to me, flowed well, and had a fair balance of construction site management protocols and actual site scenarios.
- Don't use the same site plan for the exercise every year.
- Scott was very knowledgeable and interesting. He kept the class engaged.
- More information on CD and websites would be helpful.
- Less theory and more hands-on
- Scott needs to develop a new/different group exercise for this presentation for a more experienced group.
- Although very technical, the acronym list was helpful when deciphering materials.
- I always enjoy how these workshops that are so technical can be so easy to understand. Great job by the presenters to make the content interesting and easy to understand!

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Construction Site Compliance Evaluation Summary

SAN FRANCISCO ESTUARY PARTNERSHIP

Location: **Roosevelt Community Center, Cupertino**
Date: **Wednesday, January 20, 2010**

Attendees: 107 ***Evaluations: 57***

A. OVERALL	*Strongly Disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly Agree*	**COMMENTS**
1. Room/Facility was pleasant	2	9	13	19	13	• Room was uncomfortably cold • Next time have wifi • Great facility
2. Materials were useful	0	0	3	33	21	• Text on handouts difficult to read • Too many acronyms
3. Pacing was neither too quick nor to slow	0	3	10	29	14	• Too much over-lap
4. Content was interesting	0	0	8	33	15	• Organization was lacking
5. I learned a lot	0	1	13	28	13	

B. INSTRUCTORS						
1. Instructors were knowledgeable	0	0	1	26	30	
2. Instructors answered my questions	0	2	10	19	23	
3. Instructors kept me interested	0	2	7	31	16	• Less monotone to help keep people interested • Discouraged by lack of good outlines for procedures

C. RESULTS						
1. This course will improve the quality of my work	0	0	12	26	19	
2. I would recommend the course to others	0	2	5	26	24	
3. This training was a worthwhile investment of my time	0	0	9	27	21	

D. The most useful information for me was:

- Overview of requirements

- Inspection tips
- Actual situations
- The table summaries and the CD
- Photos of existing site, examples of good and bad

E. **The least useful information for me was:**

- Vendors
- New regulation explanation was inadequate and confusing
- Examples of various erosion and how it was resolved and cost estimating
- Review was too long
- Rain for Rent presentation

F. What type of additional information would you like to see presented in the class?

- A better handbook or guideline of procedures – not just PowerPoint handouts
- Stuff related to roadway construction – arterials
- Demo of gauges to use in field
- Better distinction between general construction permit and local municipal permits.
- What does and does not work in construction inspections.

G. **Additional Comments**

- If you have inspectors for each project, why are every simple BMP not being implemented? Make inspection staff responsible for making sure BMP's are on site. Designers are rarely in the field and inspectors are daily.
- Polyacrylamide pusher – if passive use puts high levels in the output, then why would we want to use it in any form?
- The backgrounds on some slides do not transfer well on photocopies – cannot see what was on the page.
- Course was too long and very repetitive
- PowerPoint allows printing of slide handouts without the background color resulting in a white slide background. Please take this step so that the slide handouts are more readable.
- Presentation flow by all was very productive. Going through the slides in a speedy manner kept presentations from being boring.
- Too much information to absorb and follow – can someone develop a flow chart or table summary that guides the field inspector to efficient evaluation and implementation?
- The exercise was very helpful to think about and apply what was learned.
- Go through risk levels, what they mean and how to calculate them first. This will help people understand if their projects generally fall into a particular risk level.
- Should require contractors to attend these workshops to give them heads up of what agencies will be looking for in regards to compliance.
- More photos and examples would be helpful when describing the general permit changes.
- Higher quality photos would be useful; the ones presented were hard to see.
- I don't think that it is appropriate for Scott Taylor, a private for-profit consultant, to be presenting to the level where he is setting the standards for municipal requirements. This level of material should be interpreted by a state employee, associated with that program. This is a conflict of interest.

Construction Site Stormwater Compliance Workshop

May 19, 2010

Construction Site Stormwater Compliance Workshop

Santa Clara Valley Water District
Headquarters' Boardroom
May 19, 2010

Agenda

9:00 **Registration and Continental Breakfast**

9:15 **Welcome and Introduction**
Brett Calhoun, Senior Water Quality Specialist

9:20 **Understanding the New State General Construction Permit**
Scott Taylor, RBF Consulting

- Understanding Qualified SWPPP Developer (QSD) and Qualified SWPPP Practitioner (QSP) Certification and Criteria
- Understanding Stormwater and Receiving Water Monitoring

11:15 **Linear Utility Projects**
Tanya Bilezikjian, RBF Consulting

12:00 Break

12:15 **SMARTS Web Tool**
Tanya Bilezikjian, RBF Consulting

1:00 **Questions/Wrapup**

1:10 **Adjourn**

Construction Site Stormwater Compliance Workshop

	Last	First	Municipality	Email
1	Aguilar	Mirabel	San Jose	Mirabel.Aguilar@sanjoseca.gov
2	Bramer	Tim	SCVWD	tbramer@valleywater.org
3	Butler	Debra	SCVWD	dbutler@valleywater.org
4	Calhoun	Brett	SCVWD	bcalhoun@valleywater.org
5	Chau	John	Los Altos Hills	jchau@losaltoshills.ca.gov
6	Chen	Ben	SCVWD	bchen@valleywater.org
7	Chevalier	Edward	Menlo Park	EBChevalier@menlopark.org
8	Cohn	Sandy	SCVWD	scohn@valleywater.org
9	Coleman	Michael	SCVWD	mcoleman@valleywater.org
10	Collins	Donna	SCVWD	dcollins@valleywater.org
11	Crowley	James	SCVWD	jcrowley@valleywater.org
12	Desai	Hemang	SCVWD	hdesai@valleywater.org
13	Dharasker	Shree	SCVWD	sdharasker@valleywater.org
14	Ferranti	Stephen	SCVWD	sferranti@valleywater.org
15	Flammer	Kurt	SCVWD	kflammer@valleywater.org
16	Gangadhara	Hosalli	Santa Clara	GSciara@santaclaraca.gov
17	Ganjoo	Bal	SCVWD	bganjoo@valleywater.org
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19	Gharib	Pari	SCVWD	pgharib@valleywater.org
20	Griffiths	Ron	VTA	ron.griffiths@vta.org
21	Harris	Susan	SCVWD	sharris@valleywater.org
22	Heggarty	John	VTA	john.heggarty@vta.org
23	Hoa	LeeAnn	SCVWD	lhoa@valleywater.org
24	Hong	Tong	Santa Clara Co	Tong.Hong@rda.sccgov.org
25	Hosseini	Saeid	SCVWD	shosseini@valleywater.org
26	Ibarra	Ted	SCVWD	tibarra@valleywater.org
27	Idowu	Shola	SCVWD	sidowu@valleywater.org
28	Imamura	Scott	SCVWD	simamura@valleywater.org
29	Ingebrigtsen	Tracy	Stanford	tracyi@bonair.stanford.edu
30	Inman	Todd	SCVWD	tinman@valleywater.org
31	Julian	Sunshine	SCVWD	sjulian@valleywater.org
32	Lau	Gordan	SCVWD	glau@valleywater.org
33	Leal	Merna	SCVWD	mleal@valleywater.org
34	Lee	Youhan	SCVWD	ylee@valleywater.org
35	Lind	Larry	Los Altos	LLind@losaltosca.gov
36	Liu	Peter	SCVWD	pliu@valleywater.org
37	Lueneburger	Kurt	SCVWD	klueneburger@valleywater.org
38	Mason	Tami	San Jose	TMason@sjc.org
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41	Neuman	Karl	SCVWD	kneuman@valleywater.org
42	Nguyen	Ngoc	SCVWD	nnguyen@valleywater.org

May 19, 2010

Construction Site Stormwater Compliance Workshop

	Last	First	Municipality	Email
43	Nguyen	Minh-Tri	SCVWD	mnguyen@valleywater.org
44	Okane	Kristen	SCVWD	kokane@valleywater.org
45	Ortiz	Luis	SCVWD	lortiz@valleywater.org
46	Palajac	Jan	San Jose	Jan.Palajac@sanjoseca.gov
47	Pan	Nancy	SCVWD	npan@valleywater.org
48	Parks	David	Santa Clara Co	David.Parks@rda.sccgov.org
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51	Scribner	Nathan	Menlo Park	NVScribner@menlopark.org
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55	Tan	Bobby	SCVWD	btan@valleywater.org
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57	Tsou	Eric	SCVWD	etsou@valleywater.org
58	Tucker	Charles	Santa Clara Co	Charles.Tucker@rda.sccgov.org
59	Ujah	James	SCVWD	jujah@valleywater.org
60	Uyeda	Karen	SCVWD	kuyeda@valleywater.org
61	Yan	Allen	SCVWD	ayan@valleywater.org
62	Zozaya	Eric	SCVWD	ezozaya@valleywater.org

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Evaluation Form
Summary

Construction Site Stormwater Compliance Workshop

SCVWD, San Jose, CA — Wednesday, May 19, 2010, 9:00 AM – 1:00 PM

Attendees: 60 — **Evaluations: 13**

1. **Understanding the New State General Construction Permit –** Given by Scott Taylor, RBF Consulting

   Very Useful 12 **Somewhat Useful 1** **Not useful 0**

   Comments:
   - Excellent delivery
   - Provide one sheet with all acronyms

2. **Linear Utility Projects -** Given by Tanya Bilezikjian, RBF Consulting

   Very Useful 10 **Somewhat Useful 3** **Not useful 0**

   Comments:
   - Eliminate the frequent "ums", "ahs", and "ands"
   - A bit too fast
   - Difficult to read slides on handout

3. **SMARTS Web Tool -** Given by Tanya Bilezikjian, RBF Consulting

   Very Useful 10 **Somewhat Useful 2** **Not useful 0**

   Comments:
   - Do not use power point slides with background color – makes handouts difficult to read
   - Number your slides

Did this training meet your expectations? Yes: 11 No: 0

What parts of the training were most useful to you?
- New permit regulations
- Smarts portion
- Presentation #1 and #3
- Charts and procedure
- Questions about grandfathering about existing projects

What would have made this training more useful?
- Handout readability
- Bring computer and run risk level assessment
- Legible handouts

What topics would you recommend for a future training?
- Preparing a SWPPP according to the new NPDES permits

General Comments?
- Great job!

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 7-1

FY 09-10 Watershed Watch Campaign Annual Campaign Annual Report

- FY 09-10 Watershed Watch Campaign Work Plan
- FY 09-10 Watershed Watch Media Plan
- FY 09-10 Media Buy
- Watershed Watch Media Plan Calendar
- Bus Interior Cards Advertisement
- Bus Tails Advertisement
- FY 09-10 Watershed Watch Campaign Annual Campaign Report; July 2009 – June 2010

September 15, 2010

FY 09-10 Watershed Watch Campaign Work Plan - DRAFT

BACKGROUND

The primary goals of the Watershed Watch Campaign are to:

1. Change behaviors that negatively impact the watershed.
2. Encourage behaviors that protect, preserve and restore the watershed.
3. Inform audiences about activities that impact the watershed.
4. Build awareness of watershed issues in general.

In fiscal year FY 08-09, the Watershed Watch consultant AdManor, Inc.:

- Implemented the FY 08-09 Watershed Watch Campaign work plan
- Maintained and developed partnership relationships that benefit the Program
- Maximized campaign resources through value-added development and effective media implementation
- Coordinated campaign activities in consultation with the Watershed Education and Outreach Ad Hoc Task Group (WEO AHTG)
- Developed new outreach collateral and litter messages

The Campaign's FY 08-09 media buys focused on community newspapers and South Bay radio stations. Messages included problem-specific IPM messages from FY 07-08, newly developed litter messages and Mercury pollution prevention messages.

Each year, the campaign effectiveness has been measured through

- Hits on the www.MyWatershedWatch.org website
- Inquiries on the phone hotline
- Requests for information on the hotline and website
- Quantity of fluorescent bulbs dropped off at participating hardware stores and household hazardous waste collection events.
- Media gross impressions
- Spot surveys conducted at community events
- Attendance at Watershed Watch promotional events

In February 2009, the Program is contracting with a research firm to conduct a public opinion survey to evaluate the effectiveness of the Campaign. The FY 09-10 media and creative plans will be refined based on the finding of the public opinion survey.

FY 09-10 Watershed Watch Campaign Work Plan

The FY 09-10 Work Plan is based on a campaign budget of $150,000. If additional funds become available, they will be allocated according to the prioritized needs of the campaign and feedback from the WEO AHTG.

Whenever possible, Watershed Watch Campaign activities will be coordinated with activities of other local and regional outreach programs (e.g., the BASMAA Regional Ad Campaign, HHW Program and the County Integrated Waste Management Program campaigns, and the BASMAA/BACWA Media Relations Committee). Campaign activities will be evaluated on an ongoing basis, and changes made as required for effectiveness.

In FY 09-10, AdManor Inc. ("consultant") will implement the following tasks to achieve the goals of the Campaign.

TASK 1: Creative Development

This task includes revisions to existing messages or the development of an additional message (e.g. automotive related message). Creative needs will be determined by results of evaluations and as dictated by the priorities of the Campaign (media selection, messages, and all applicable production).

TASK 1 DELIVERABLES:

Final deliverables are contingent upon media plans and WEO AHTG agreement about the message focus for each campaign flight. Deliverables may include creative materials for:

- Print media (newspaper, magazine, coupon ads)
- Transit media (bus board posters)
- Radio (recorded messages, public service announcements)
- Collateral (point-of-purchase displays/prompts, materials for distribution)
- New media (internet, social media, or other new media production)
- Cable television

A part of the budget will be used to develop and produce giveaways (e.g., flyswatter, pencils)

TASK 1 BUDGET: $8,500

TASK 2: Media Advertising

The FY 09-10 media plan will be reflective of the recommendations, evaluations and any trends found in the 2009 public opinion survey. For example, focus group research from 2003 and 2006 suggested that a top of mind awareness (TOMA) approach to media could be more effective than concentrated media campaigns, as a consistent reminder to "do the right thing." After two complete campaign years and media schedules with this approach, the public opinion survey may indicate whether TOMA is being achieved.

The consultant will develop media partnerships, schedules / flight plans and budget allocations in a comprehensive media plan. In developing these plans, the consultant will work with the WEO AHTG to clearly identify and define their media goals and preferences, and obtain their approval.

Requests for proposals will be developed to educate the media regarding the goals of the campaign, the prospective media schedule(s)/plan, budget, and the criteria on which proposals will be judged. RFPs will be distributed to media in the geographic target area, defined as Santa Clara County geographic area, also known as the area of dominant influence (ADI). San Francisco media may also be included with the instruction that comparative data is based on coverage of Santa Clara County audiences.

"New media" or online and mobile phone advertising messaging will be explored in

addition to traditional media.

Media Allocation

The consultant will allocate the media budget proportionate to language/population of the target audiences, and the media's effectiveness in delivering audiences and added-value to the campaign. The consultant will create an appropriate balance based on the goals, budget for the campaign, any timely circumstances and/or other campaign partner activities relevant to Watershed Watch goals and messages.

Media Selection

Media selection may be impacted by the outcome of the public opinion survey, and whether the TOMA approach is effective. The TOMA campaign has focused on delivering more consistent messages to a narrower, more targeted audience. The alternate is utilizing media with a broader reach and more "high-impact" short-term schedule.

Media will be evaluated for its: effective reach in the ADI (ratings); efficiency based on cost per point, reach & frequency to target audience(s), added value, and partnership opportunities.

Media will be selected to create a desirable balance of reach and frequency; limited duplication in programming and formats for maximum reach; maximum impact weighing rating points and impressions; and adequate frequency to create impact.

Selection will consider the proportion of media in English and Spanish relative to the population, effectiveness in delivery of the message, the messages the Campaign wants to deliver, partnerships and value-added media and promotions.

Media Schedule

The FY 09-10 media schedule will be reflective of the results of the public opinion survey (TOMA/ongoing vs. concentrated schedules) and in support of Campaign events and seasonal messages.

The consultant will present the recommended detailed media plan to the WEO AHTG for approval. The media plan will be revised as needed based on comments received.

Upon approval of the media plan, the consultant will confirm schedules with the media and secure contracts, including written commitments of added value and promotions. All creative materials and traffic instructions/insertion orders will be distributed to the media.

Task 2 DELIVERABLES:

- RFP to Media (Media Negotiation)
- Media Recommendations
- Media Plan
- Traffic (creative and scheduling instructions) / Distribution to Media
- Billing / Reconciliation / Documentation
- Media Campaign Summary (Report)

Task 2 BUDGET: $82,850

Task 3: Partner Development and Coordination

Developing partners has proven successful in augmenting campaign resources. Partners have distributed Watershed Watch materials through educational and promotional activities and events, offered web site links, sponsorship status for events, and shared other resources. The consultant will continue to work with past and existing partners so that the list of partners continues to grow each year.

The consultant will explore development of additional partnerships, such as:

- Additional or alternate media partners – Comcast Cable, VietUSA, Cinemas, Pennysaver, ValPak (direct mail media), movie theaters, etc.
- Water-related / outdoor activity businesses or sporting retailers – Fishing, boating, rafting, kayaking, parks and open space groups
- Hardware/garden/home improvement – OSH (currently through BASMAA), Ace Hardware.
- Educational - San Jose Tech Museum, San Jose State University Environmental Studies Department, Santa Clara University Environmental Sciences Institute; encourage student studies and projects focused on watershed protection and pollution prevention in cooperation with Watershed Watch.
- Automotive – dealers, oil change / service centers, auto parts / targeting do-it-yourself oil changes

The consultant will distribute a partnership kit to all new partners and potential partners, which presents partnership benefits and opportunities and tools for displaying their support of WW, and thanks them for their partnership. In pursuing new partners, when appropriate, the consultant will develop customized proposals with specific benefits and creative partnering opportunities, developing mutually beneficial relationships and activities. The consultant will continue to seek partners that provide discounts on products and services to patrons using the Watershed Watch card.

The support of these relationships includes coordinating outreach materials or messages, promoting the partner's interests that are shared with the Program, participating in key activities and events, and suggesting or developing win-win opportunities. A calendar of events will be maintained to keep all partnership activities "on the same page."

Changes and developments in media from the previous year may impact the availability or recommended change in partnership pursuits.

If needed, the consultant will help the WEO AHTG review other local and regional campaigns (e.g., the BASMAA Regional Ad Campaign), and provide feedback.

Task 3 DELIVERABLES:

- Ongoing contact with partners; work with existing partners and renew previous partners
- Partnership kits (ongoing)
- Maintain updated contact data and partnership details
- Development of new creative partnership opportunities / scenarios

- Monthly written report of results or activities
- 2 new community/business partnerships

Task 3 BUDGET: $5,000

Task 4: Development of Value-Added Resources

The media offers excellent value added opportunities. The consultant will negotiate media buys and partnerships for added media exposure, requesting innovative partnerships and sponsorship opportunities with the media and their advertisers. When media proposals lack relevance or inspiration, the consultant will develop and propose concepts, beginning with additional media.

Opportunities include but are not limited to:

- Contests to provide public awareness and incentive
- Donations of products or services to use as incentive
- Signage or space to provide prompts
- Public Service Announcements / donated airtime or space
- Sponsorships
- On-site events
- Cross-promotions with other media clients and with the stations/publications
- Web links, etc.

The consultant will also explore new methods and channels of distribution for campaign messages, as well as activities or opportunities to encourage desired outcome from the audience, and reinforce the positive impact of that action.

Events offering relevant opportunities may be:

- Earth Day events throughout the region
- Home & Garden Shows
- Garden Tours
- Santa Clara County Parks & Recreation events and venues
- Beach/Creek Clean-up days
- Outdoor events/activities that take place in a watershed recreation area
- “Green” living/sustainability or health-related events

Task 4 DELIVERABLES:

- Value-added as negotiated with media and partners
- Monthly written report of results or activities
- Two third-party promotions

Task 4 BUDGET: $5,000

Task 5: Website Maintenance

The consultant will maintain the Watershed Watch website on an ongoing basis, encouraging partners to provide news, and creating more ways and reasons for the public to use the site.

The consultant will edit the site to maximize the usability of the site and help people easily and quickly find the information they seek, and maximize the educational impact and effectiveness of the site. As budget allows, this will involve streamlining the functionality of the site to eliminate extraneous files, and translating more features of the site into Spanish (relevant Watershed Watch pages linked to the Spanish site).

The consultant will update it regularly with the latest news/ articles, creative, partnership links, and events/announcements, including removal of expired or past events and news in a timely manner.

The consultant will track web activity and comment on any potentially relevant trends observed.

Task 5 DELIVERABLES:

- Monthly/ongoing maintenance
- Monthly written report of results or activities

Task 5 BUDGET: $7,000

OPTIONAL: WEBSITE REDESIGN
Please see Addendum I with an optional website redesign proposal.

If the website redesign proposal is approved, the regular maintenance cost would be reduced to $6,000 and other changes will be completed within the scope of site redesign. Website redesign estimate: $11,500

TOTAL TASK 5 + Addendum I Budget: $17,500

Task 6: Outreach Events

The consultant will maintain a comprehensive calendar of events including:

- Partner events (car wash events, garden/gardening, HHW, etc.)
- Relevant holidays or observances (Earth Day, Arbor Day, etc.)
- Media schedules

The consultant will work with WEO AHTG to create an event plan for prioritizing events according to budget, resources and Campaign goals.

The consultant will evaluate and recommend relevant events in the FY 09-10 to reach greater numbers of people, support campaign partners, promote messages/areas of focus (litter, IPM, etc.), and take advantage of added-value / media opportunities when possible.

Task 6 DELIVERABLES:

- Event plan development and maintenance
- Coordination of events (applications, registration fees, materials, etc.)

- Participation / representation at events (equivalent to 5 days)
- Event survey / written report of results or activities

Task 6 BUDGET: $7,000

Task 7: Media and Public Relations

Public and press relations, both proactive and reactive, will be utilized to increase audience awareness and understanding of current events and activities that affect the watersheds.

News created by the actions of nature, politicians and local citizens, and BASMAA media outreach activities may be maximized to promote watershed awareness and public education opportunities. When appropriate, the consultant will craft a relevant news story based on general conditions, campaign events or partner events, or current trends.

Specifically, the recruitment and public awareness of Santa Clara Valley Green Gardeners will be promoted.

The consultant will pitch stories to the local press promoting the Program's perspective.

Materials will be emailed to partners and co-permittees for their approval, use and distribution, and/or loaded to the website for download.

The consultant will also utilize community calendars in internet, print, TV and radio for no-cost announcements of events, programs and activities.

Task 7 DELIVERABLES:

- PR plan development and execution (3 pitches/PSAs)
- Ongoing maintenance of press contact data
- Clippings when available

Task 7 BUDGET: $5,000

Task 8: FY 10-11 Work Plan Development

The consultant will compile and submit monthly, mid-year and year-end campaign activity reports for all applicable tasks. Details will include measurable results of campaign activities and estimated added-value amounts.

The consultant will develop the FY 10-11 Work Plan and Media Plan, consistent with the 3-year conceptual plan and adapting to the outcome of the FY 09-10 campaign.

Task 8 DELIVERABLES:

- FY 10-11 Work Plan
- FY 09-10 mid-year and year-end reports

- Monthly reports

Task 8 BUDGET: $5,500

BUDGET SUMMARY:

BUDGET SUMMARY:

TASK 1 Creative Development	$8,500
TASK 2 Media Advertising	$82,850
TASK 3 Partnership Development	$5,000
TASK 4 Added-Value Development	$5,000
TASK 5 Website Maintenance plus Redesign	$17,500
TASK 6 Event Coordination	$7,000
TASK 7 Media/Public Relations	$5,000
TASK 8 FY 10-11 Work Plan	$5,500
TOTAL CONSULTANT BUDGET	$136,350
EOA Mark Up	$13,635
TOTAL CAMPAIGN BUDGET	**$149,985**

Addendum I

SCVURPPP Watershed Watch Campaign Website Rejuvenation FY 09-10

Overview

The Watershed Watch website is of significant importance to the campaign, providing an affordable and customizable medium for disseminating watershed education and pollution prevention messages, and a method for measuring public response and interest.

The current website provides a wealth of information, but has room for improvement in evolving to meet new standards in user expectations and achieving better rankings in online searches.

Some changes are not possible based on the existing design, such as adding or deleting navigation buttons, so a new site design would allow more freedom and flexibility in what we can present to keep the site fresh and relevant.

The back end of the site is a complex web of content that requires review to ensure that only relevant content is linked to and contained in the site in order to streamline the function.

The top 600-1000 pixels of the current home page look unchanged to each visitor, every time. That is, when they open the site in their web browser, it always looks the same until they scroll down to see the newest additions to the home page (the most current events and features), and some visitors may not bother to do so.

A new home page design will allow the user to see more current news and relevant (desired) information at first glance. Ideally, this will encourage users to spend more time on the site and to visit more frequently.

Goals

- Function
    - Condense and streamline
        - More intuitive to the user's use of the site
        - Fewer clicks to find the data visitors seek; quick links from main page to most popular (frequently visited) items
    - Optimize for search engines with relevant information and key words
- Design / Appearance
    - Update visual and navigational style for a clean look that presents more current information in primary view with less scrolling
    - Contemporary look to appeal to an evolving and more savvy internet audience
- Content
    - Maintain the relevant information from the current site to minimize rewriting and translation
    - Develop (write) new content as needed to meet the needs of the site and user-desired content
- Completion / Work Plan
    - Complete English site prior to starting Spanish site
    - Upon approval of English site and all content, implement Spanish site

- Continue maintaining and updating data on existing site throughout production
- "Go live" upon approval

Scope of Work

1. Develop design style

- Develop and present several layout options.
- Maintain familiar elements of the existing site (e.g. images, colors) while implementing a more current presentation and streamlined navigation
- Revise as needed to achieve approval
- Implement all pages to approved/final style: Approximately 40 active pages (plus linked attachments and external links) for each English and Spanish (approximately 80 pages total)

Samples of modern sites that present a high quantity of content on the page without seeming too busy:

- City of Monterey recycling page www.montereyrecycles.org
- Monterey Regional Waste Management District - http://www.mrwmd.org

2. Content

- Utilize the site activity data (reporting) to determine which content should be featured most visibly and readily accessible, such as Definitions, Volunteer Opportunities, and Problems / Solutions.
- New technology / new media
  - Determine whether or not new technology such as RSS Feeds, blogging or other social networking tools can enrich the content and expand the use of the site
  - Determine how to maintain and maximize it
  - Integrate as deemed appropriate by the Program
- Outline the proposed site content / site map and organize all content
- Use existing messages / content where relevant
- Revise as needed to maximize the visible content for search engine optimization *(ensure the text has popular relevant search words appearing frequently and early as possible in the site content)*
- Develop new content as needed
- Translate into Spanish
  a. All new and revised content
  b. Any content currently linked to the Spanish site that is not yet provided in Spanish

3. Coding

- Code and link all pages
  - Site and page functionality
  - Internal and external page links
  - Link all downloadable attachments
- Search Engine Optimization (SEO)
  - Identify and integrate key words/meta tags *(words and short phrases that describe the content of the site – the more these words appear in the site – both visibly and on the back-end – the better chance the site has of*

ranking highly on search engines in relevant searches; words are strategically selected to address maximum users' searches)
    - Search engine registration
- Tracking / Evaluation
    - Google Analytics, other free web activity analysis tools – fully coded site to track all linked / downloaded documents and activity
- Load and test
- Go live upon approval

Estimate

Estimate is based on:

1. Design & Production
    - Design style (present up to 3; implement 1)
        - Includes up to 2 Revision cycles to achieve final design approval
    - Format content; implement content into approved layout
        - English and Spanish

    DESIGN & PRODUCTION TOTAL $5200

2. Content
    - Copy editing (review and revise existing copy)
    - Copy writing (develop new copy as needed)
    - Translation to Spanish

    CONTENT TOTAL $3250

3. Coding
    - Code and link
    - SEO and registration
    - Test

    CODING TOTAL $3040

TOTAL WEBSITE REDESIGN: $11,490

Work Plan

The proposed work plan is as follows:

PHASE I
Research & Development
- Meet with the Script Review Committee to determine any preferences, wants and needs for the site
- Review example sites (Committee can provide sites they like for example of function, features and layout)
- Compile data regarding popular search words and phrases

Design / Layout
- Design three different looks / layouts

- Present layouts and receive feedback
- Revise selected look to achieve approved design

Content
- Present outline for site (site map) including all linked files and resources
- Present new and revised content for review and approval
- Revise content as needed to achieve approval

Estimated time for Phase I = 1 month
Contingent upon review and approval

PHASE II
Design / Layout
- Implement approved content into English site
- Present and revise as needed to achieve approval

Content
- Translate approved content into Spanish

Estimated time for Phase II = 1 month
Contingent upon review and approval

PHASE III
- Code site as needed
- Implement Spanish site
- Present and revise as needed to achieve approval
- Test
- Register
- Go live

Estimated time for Phase III = 2 weeks
Contingent upon review and approval

FY 09-10 Watershed Watch Media Plan

REVISED 7-27-09

MEDIA OVERVIEW

Budget

The total FY 09-10 media budget is $82,850 in Watershed Watch Campaign funding.

To reflect target audience demographics, approximately 25% or $21,000 of the budget should be in Spanish-language media (per 2007 Census data for Santa Clara County, persons of Hispanic origin).

Co-permittees City of Sunnyvale and City of Cupertino to date have pledged combined $2,000 additional to be allocated to VTA Transit (Bus Tail) ads with a Litter message. This brings the total media budget to $84,850.

Audiences

All ratings/reach information is specifically for the Santa Clara County market.
For general market, efficiencies are based on reaching adults 25-54. When available, efficiencies for audiences 35+ have been provided to gauge the most efficient media for reaching the primary target audience. For Spanish language, the consultant focused on ratings in the 18-49 demographic, consistent with the population.

Messages

The media campaign will focus on pesticide, Green Gardener and litter messages, with car wash messages to promote promotional partnership events and awareness of automotive pollutants. Most messages for print and radio are produced and ready to air / publish.

New messages in the form of brief and frequent tips for pollution prevention and watershed education/trivia will be developed in order to take advantage of blogging, emailing and social networking opportunities. If television and/or online video applications will be utilized, new production will be developed accordingly.

Scheduling

Schedules will maintain a media presence throughout the year. IPM messages are timely in late spring, summer and early fall. Litter messages are especially timely during the rainy season early winter through the spring. Mercury (CFL as HHW) messages are timely outside of daylight savings hours when indoor lighting is used more. Green Gardener messages will be focused around the class schedules (student recruitment prior to registration deadlines, and promotion of Green Gardeners following graduations).

Car wash messages and events are ideal for late spring and throughout the summer and early fall when car washing is eminent. Media and carwash events with partners will be scheduled accordingly.

The following are the media plans for Spanish and English based on decisions/requests by the WEO AHTG. <u>All costs are contingent upon final negotiation with the media, after the plan is approved.</u>

SPANISH MEDIA - RADIO / PRINT / INTERNET

BUDGET: $21,330

Radio – *KSJO 92.3 FM*

- 12 weeks radio
    - Run 6 months; 2 weeks per month
- Provides targeted reach to the local audience
    - A top rated station in Santa Clara County market
    - KSJO mentioned as a preferrred station in Campaign focus groups
- Radio stations are promotions-oriented
    - Support for Campaign events
    - Sponsorship of station events (select or develop relevant events)
- Existing creative allows the Campaign to hit the ground running

Print - *El Observador*

- 26 insertions out of 52 weekly issues; run every-other-week for year-round campaign
- Provides small but targeted reach to the local audience (20K in Santa Clara County)
- ADDED-VALUE
    - ONLINE
        - Print ads will appear in *El Observador* electronic edition (online)
        - Website banner with a link to Campaign website year-round
    - EVENTS
        - Distribution of Watershed Watch marketing material/handouts and messages (e.g. Discount Cards) at local festivals and events where EO participates (long list of events throughout the South Bay)
    - TRANSLATION / CREATIVE
        - Translation provided for new messages
    - EDITORIAL
        - Editorial support (3 articles/press releases - 400 words per article)

Internet – *Google AdWords, KSJO.com*

- Google AdWords
    - 12 weeks Google AdWords based on estimated $0.50 cost per click and 150 clicks per week.
    - Actual costs will vary according to key words and competitive cost-per-click bids (likely lower costs will allow more clicks, and weeks will be added as they are afforded).
    - Target local audiences searching for solutions, events and education; use frequently searched key-words to guide local users to Watershed Watch website
- KSJO Online
    - 10-weeks banner ads
    - Combine on-air with online station media for synergy and added frequency
        - Ad content and on-air announcements invite site traffic
    - Relationship to favorite station provides good-will in Latino community

ENGLISH - CABLE TELEVISION / RADIO / OUTDOOR / INTERNET

BUDGET: $62,536

Television – *Comcast Spotlight Cable*

- 16 weeks of cable TV advertising; 2 weeks per month from November 2009-June 2010.
- Provides geographic targeting to San Jose Zone, Silicon Valley Zone and South Peninsula Zone to reach all jurisdictions with limited waste
- Scheduled to reach maximum viewers in prime access (4-7pm) and prime time (7pm-12mid)
- Builds frequency with audience over course of the campaign
- NETWORK SELECTION:

- Networks selected for ratings with primary target audience (college educated homeowners 35+) and rates to fit within the campaign budget
- Paid networks are all basic cable subscription channels
  - TNT "we know drama"
    - Features sports (golf, NASCAR, NBA), syndicated and original drama series, movies
  - TBS "very funny"
    - Features syndicated and original comedy programs, movies and Sunday MLB baseball
  - HISTORY
    - Features original programming and movies
  - ESPN
    - Features "SportsCenter," sports and games
  - COMEDY CENTRAL
    - Features movies, "Daily Show," "Colbert Report," original and syndicated comedy programming
  - COMCAST SPORTS BAY AREA
    - Features Sharks, 49ers, Raiders, A's, Giants, Kings, Warriors, Earthquakes
  - FX
    - Features original and syndicated programming, movies
- ADDED VALUE
  - Every paid spot is matched with a 6am – 12mid spot (no overnights) on the same channel as the paid spots
  - 500 additional spots on Planet Green, Comedy Central, True TV, Style TV, National Geographic (based on target audience and inventory availability)

Radio – *KBAY 94.5 FM*

- Budget allows 10 weeks of radio
- Recommend one station rather than several, toallow adequate frequency and impact with the listening audience and maximize added value opportunities
- KBAY provides large reach to the target audience on top-ranked station
- Added value:
  - PSAs
  - On-air announcements / tips
  - Online media
  - Promotional support for Campaign events
  - Community involvement in station-sponsored events

Internet – *Facebook, Yahoo, Google*

- *Yahoo.com to be determined: MercuryNews.com does not generally sell Yahoo.com independently.*
- Affords an estimated 16 weeks on Google and Facebook; 8 weeks on Yahoo.com
  - Google AdWords and Facebook based on estimated $0.50 cost per click and 150 clicks per week.
  - Actual costs will vary according to key words and competitive cost-per-click bids (likely lower costs will allow more clicks, and weeks will be added as they are afforded).
- Direct links to WW website, Facebook page, WW Quiz, Discount Card, etc.
- Target geographically, by interests, and key words
- Measurable response
- Effective to reach 18-34 audience
- 35+ audience use is growing

Outdoor / Transit – *VTA Bus Tails*

- Bus tails targeted in Santa Clara County

- High visibility position on back of bus
- 50 showing for one 4-week period in FY 09-10, pending final negotiation of VTA contract and final sum of Co-permittee funding contributions.
- Currently, two jurisdictions have pledged contributions toward VTA advertising with Litter messages. If additional funding is available, it may allow additional bus tails, and/or more weeks in FY 09-10.
- Planned for the end of FY 09-10 and will be carried into FY 10-11 media to allow a longer run and higher impact. This assumes approval of the FY 10-11 media budget for this purpose.

09-10 Fiscal Year

MEDIA

SPANISH	Radio / Print / Online												
Station		Weeks	Spots/ Week	Spons/ PSA's	Total Spots	Week Freq.	Total Freq.	Cost Week	Net Reach	GI's Week	GI's Total	CPM	Total Cost
Radio													
KSJO (15/30s)	92.3 FM	12	28	0	**336**	**2.0**		**$ 1,220**	**28,600**	**57,200**	**686,400**	**$ 21.33**	**$ 14,640**
Total Spanish Radio													**$ 14,640**
		weeks/mos	Ads per Mo.	Cost per Ad	Total Ads	Plus		Cost per week	Reach (Circ)		GI's	CPM	Total Cost
Print Media													
El Observador	2 col x 5" ROP	26	1	0	**26**	**online**		**$ 165**	**19,999**		**519,974**	**$ 8.25**	**$ 4,290**
Total Spanish Print													**$ 4,290**
Internet Media *(Besides offers as part of a package)*		Weeks											
Google AdWords	per click key words	12	150		1800			$ 75			1,800		$ 900
KSJO Online	728x90 Banner ads	10						$ 150					$ 1,500
Total Spanish Online													**$ 2,400**
SPANISH	**Radio / Print / Online Total**										1,208,174	$ 17.65	**$ 21,330**
ENGLISH MEDIA	**Cable Television / Radio / Internet / Outdoor**												
Station		Weeks	Spots/ Week	Spons/ PSA's	Total Spots	Week Freq.	Total Freq.	Cost Week	Net Reach	GI's Week	GI's Total	CPM	Total Cost
Cable Television										*HH Impressions*			
Comcast Cable TV	SV, SP + SJ Zones	16	81	81	2592	2.5	8.3	$ 1,846		147,989	2,367,824	$ 12.47	$ 29,536
Comcast Cable TV - BONUS	SV, SP + SJ Zones	16		500	500					26,634	426,144	$ -	$ -
Cable Television Total					3092					**174,623**	**2,793,968**	$ 10.57	**$ 29,536**
Station (KBAY, KRTY or KUFX for promotions)		**Weeks**	**Spots/ Week**	**Spons/ PSA's**	**Total Spots**	**Week Freq.**	**Total Freq.**	**Cost Week**	**Net Reach**	**GI's Week**	**GI's Total**	**CPM**	**Total Cost**
Radio													
KBAY (60/30/15s)	94.5 FM	10	25	9	340	2.0	13.4	$ 2,000	91,100	182,200	1,822,000	$ 10.98	$ 20,000
Total Radio											**1,822,000**		**$ 20,000**
Transit / Outdoor Media		*4-week*											
****CBS Outdoor**	**VTA Bus Tails**	**1**	**50**					**$ 7,000**		**0**	**1,256,000**	**$ 5.57**	**$ 7,000**
Transit Total													$ 7,000
Internet Media *(Besides offers as part of a package)*		Weeks											
Google AdWords	per click key words	16	250		4000			$ 125			4,000		$ 2,000
Yahoo.com	300x250 ads 35+SCC	8						$ 250		25,000	200,000	$ 10.00	$ 2,000
Facebook Ads	cost per click ads	16	250		4000			$ 125			4,000		$ 2,000
Total Online											208,000		**$ 6,000**
ENGLISH	**Television / Radio / Internet / Outdoor Total**										6,079,968	$ 10.29	**$ 62,536**

TOTAL MEDIA BUDGET		**$ 82,850**
***CO-PERMITTEE CONTRIBUTIONS**	**(Pledged from Sunnyvale and Cupertino for Transit ads, Litter message)**	**$ 2,000**
		$ 84,850
TOTAL MEDIA BUY		**$ 83,866**
BALANCE (OVER/UNDER0		**$ 984**

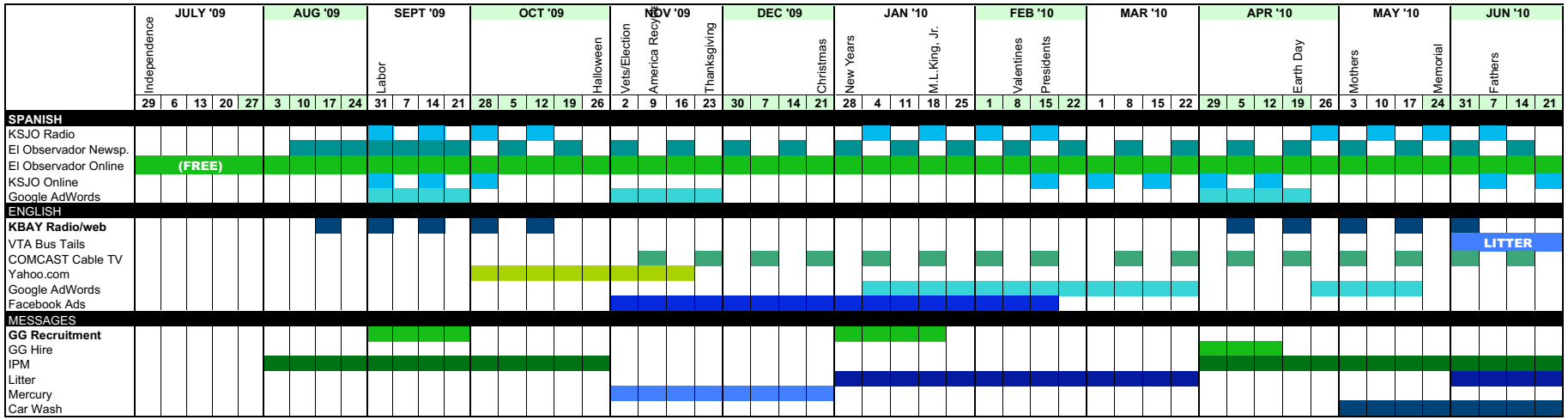
***Co-Permittee funding is allocated to VTA transit ads with a LITTER message. Additional contributions may allow earlier run, a longer run, or more bus tails (i.e. 75 showing)**

****To be scheduled for 8-week run June 2010-July 2010, assuming approval of FY 2010-2011 Media Budget.**

Costs/rates are contingent upon final contract negotiation with the media, after the plan is approved.

Adtrans, Inc.
(866) 444-2623

Revised / Updated 7/31/09


JULY '09
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MAY '10
JUN '10
Independence
Labor
Halloween
Vets/Election
America Recycle
Thanksgiving
Christmas
New Years
M.L.King, Jr.
Valentines
Presidents
Earth Day
Mothers
Memorial
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29 6 13 20 27 3 10 17 24 31 7 14 21 28 5 12 19 26 2 9 16 23 30 7 14 21 28 4 11 18 25 1 8 15 22 1 8 15 22 29 5 12 19 26 3 10 17 24 31 7 14 21
SPANISH
KSJO Radio
El Observador Newsp.
El Observador Online
(FREE)
KSJO Online
Google AdWords
ENGLISH
KBAY Radio/web
VTA Bus Tails
LITTER
COMCAST Cable TV
Yahoo.com
Google AdWords
Facebook Ads
MESSAGES
GG Recruitment
GG Hire
IPM
Litter
Mercury
Car Wash

Watershed Watch
Protect Our Creeks And Bay

Prevent litter to protect our creeks and Bay | **www.MyWatershedWatch.org**

An initiative of Santa Clara Valley Urban Runoff Pollution Prevention Program – a coalition of local government agencies.

VTA Healthy plane
Healthy you

Watershed Watch
Protect Our Creeks And Bay

Prevent litter to protect our creeks and Bay **| www.MyWatershedWatch.org**

An initiative of Santa Clara Valley Urban Runoff Pollution Prevention Program – a coalition of local government agencies.

AdManor inc
Multimedia Marketing

July 15, 2010

To: Jill Bicknell, SCVURPPP
Vishakha Atre, SCVURPPP

From: Sandi Manor

Re: FY 09-10 Watershed Watch Campaign
Annual Campaign Report; July 2009 – June 2010

Campaign Summary
In the FY 09-10, the consultant worked with SCVURPPP to implement the FY 09-10 Work Plan. Highlights of this year included the development of television creative and new transit ad creative featuring anti-litter messages, participation in social networking, and Watershed Watch Campaign (Campaign) website redesign.

"Watch Out" message continued in print (only in Spanish), web and radio advertising in a frequency-based media plan to keep the Campaign messages continually present in the local media.

The consultant pursued partnerships and value-added development, creative support to update Campaign materials, provided event coordination and staffing, and maintained the website.

This report summarizes completion of tasks, activities, and effectiveness of the annual campaign.

Summary of Tasks

Task 1: Creative Development
Existing Spanish Integrated Pest Management (IPM) and Litter radio and print ads were utilized, as well as existing IPM and "Hire a Green Gardener" English radio spots. Spanish "Green Gardener" class radio spot was updated with fall 2009 class date information. New creative utilized existing/approved themes.

New creative was developed as follows:

<u>TELEVISION</u>
LITTER TV
A 30-second English spot was developed. Several creative concepts were presented and evaluated for their effectiveness and appropriateness in educating the public about the importance of litter prevention as it impacts storm water pollution. Existing creative developed by other storm water agencies were also considered.

The "Karma" concept (litter and it comes back to you) was selected and implemented, striving for a unique execution of a popular concept. The spot presents a variety of problem litter items and sources (auto litter, food wrappers, cigarette butts, uncovered truckloads), and their direct solutions (tarp your load, use a car litterbag, don't litter), as well as a direct storm drain

connection from curb to creek. Tagline for the message was “what happens here (storm drain) doesn’t stay here.”

RADIO

CAR WASH RADIO AD

A 60-second radio spot (English) was developed for the Capitol Premier Car Wash event to meet the needs of the KBAY radio schedule.

GREEN GARDENER CLASSES RADIO AD

The Spanish Green Gardener radio spot was updated with Fall 2009 class dates.

WEB/ONLINE ADS

IPM WEB ADS

Animated ads were developed in Spanish for ClearChannel KCNL web sponsorship and donated El-Observador.com web space. Ads implemented content from the four print ads featuring roses, yellowjackets, snails, and weeds into animated flash files.

CAR WASH WEB ADS

Car wash ads were developed for use on Yahoo.com to promote the spring car Wash Events at Classic Car Wash (2 locations/dates) and Capitol Premier Car Wash, using previous print ads as visual inspiration.

FACEBOOK FAN – WEB ADS

An ad promoting the Watershed Watch Facebook page was developed. The consultant also developed simple car wash event ads for Facebook.com.

PRINT and COLLATERAL

WW DISCOUNT CARDS

Watershed Watch Discount Cards were updated to include a 2010 expiration date and uploaded to the website. In Spring 2010, the card was redesigned to include a Jiffy Lube offer.

POOL BROCHURE

The consultant updated the online version of the pool/spa brochure to include the new website address and print date. The updated version was posted to the Campaign website.

CAR WASH BROCHURE

The consultant provided graphics and feedback regarding content for the car wash brochure. The brochure was posted on the Campaign website.

TEMPORARY TATTOOS

A new 2”x2” sized 2-color design was implemented into temporary tattoos for event giveaways.

TRANSIT/OUTDOOR

LITTER TRANSIT AD

A bus tail ad was developed to incorporate the litter message from the TV campaign utilizing the tagline “what happens here (storm drain), ends up here (in a creek)” with corresponding images.

This ad was also adapted for interior bus card use for a partnership with VTA to be implemented in Summer 2010, and provided in an editable format to the City of San Jose for use on trash/recycling receptacles in parks.

Task 2: Media
In 2009, some media prices had dropped to reflect the change in advertiser demand for airtime, and/or media companies were providing added value to campaign proposals to compete for the Campaign's business. The consultant recognized the opportunity to extend the Campaign's media by inviting a broader group of media to compete for the budget, while also addressing specific WEO AHTG media requests and preferences.

The approved FY 09-10 media campaign approach was a continuation of the frequency-based approach, utilizing: Spanish radio, print and online media; top-rated South Bay general market (English) radio; cable television targeting Santa Clara County; transit; and paid online advertising.

Campaign audiences include the primary target audience of college-educated Santa Clara County homeowners aged 25-54, with secondary audiences of Spanish adults aged 18-49, and general market audiences of all ages. To reflect the audience demographics, approximately 25% of the budget was allocated to Spanish-language media.

The consultant developed a media calendar to include planned events, media dates and corresponding creative messages; received and reviewed media proposals, ratings data and contracts; negotiated media buys and added-value; reacted to changes in the local media (Spanish radio station changing format[1]); sent traffic orders and creative (including copy points for live announcements and art direction for added-value web ads) to fulfill media buy according to the approved plan; coordinated and reconciled billing.

MEDIA BUDGET AND CONTRIBUTIONS
The total FY 09-10 media budget was $82,850 in Watershed Watch Campaign funding.

Additional media support funding was contributed by co-permittees specifically for the implementation of anti-litter messaging on transit (bus tail) advertising, bringing the total media budget to $85,850.

Co-permittee	Contribution
City of Sunnyvale	$1,000
City of Cupertino	$1,000
City of Milpitas	$1,000

MEDIA SELECTIONS
Program-funded media included:

- KBAY general market (English language) radio with added-value partnership support, event promotions, and Planet KBAY sponsorship during our paid schedule weeks, which included a daily 15-second recorded tip and refers the audience to the Planet KBAY page for more information where they find a Watershed Watch logo and link to the Watershed Watch website.

[1] La Preciosa radio maintained its format and parent company, while moving from one station/signal to another. It moved from KSJO 92.3 FM to KCNL 104.5 FM on September 18, 2009. At the end of February 2010, KCNL was sold and changed format. At that time, the Consultant cancelled the remaining KCNL contract, sent requests for proposals to several Spanish broadcast media companies and (in consultation with Program staff) selected the best replacement.

- KSJO/KCNL La Preciosa Spanish radio and online ads
- KBRG Spanish radio
- Comcast Cable TV in Santa Clara County (excluding Gilroy/Morgan Hill areas) including Comcast.net and prize donation added-value which will be utilized for contest incentives in FY 10-11
- Transit VTA bus tails in Santa Clara County
- Online ads on Facebook, Yahoo.com with MercuryNews.com as added-value, and Google AdWords
- Spanish weekly newspaper *El Observador* with online added-value

GREEN GARDENER ADVERTISING
"Hire a Green Gardener" Radio spots promoting the Green Gardener program, encouraging homeowners to hire a Green Gardener, ran August 24-30 and September 7-13, 2009 on KBAY radio.

GREEN GARDENER RECRUITMENT ADVERTISING
"Become a Green Gardener" Spanish radio spots promoting the Fall 2009 Green Gardener certification course program ran August 31-September 6 and September 14-18 on KSJO/KCNL.

IPM ADVERTISING
"Watch Out for Pesticides" radio ads promoting the use of IPM practices ran September and October 2009 and April through June 2010 on KBAY; Spanish language ads ran in October on KCNL and April through June on KBRG.

Print ads in *El Observador* featured IPM problems and solutions for snails/slugs, roses, yellow-jackets, and weeds July through November 2009, then April through June 2010.

Animated online ads reflecting print ad campaign (popular garden/pest problems) ran on El-Observador.com and KCNL LaPreciosa.com October and November 2009, and again on El-Observador.com April through June 2010.

LITTER ADVERTISING
Litter messages "Litter is Water Pollution" ran in *El Observador* print and online December 2009 through March 2010 informing audiences that litter is water pollution and making the storm drain connection to the Bay.

Spanish "Litter is Water Pollution" web message ran on KCNL LaPreciosa.com December 2009-February 2010.

Litter TV "Karma" ran on Comcast Spotlight February 2010 through June 2010 with accompanying online ads on Comcast.net March through June 2010.

"Watch Out for Water Pollution" litter radio ran January and February on KCNL Spanish La Preciosa.

Litter "What happens here…" bus tails were installed at the end of May 2010 and continued through June 2010.

Litter online ads ran on Yahoo.com in April, May, and June 2010.

CAR WASH ADVERTISING

Carwash online ads ran on Yahoo.com and Facebook.com in April, May, and June 2010 to promote the 50% off car wash events.

Radio ads ran on KBAY FM in May and June to promote the 50% off car wash events and educate about preventing runoff pollution from car washing.

SUMMARY OF MEDIA BUYS

The media schedule included:

27 print ads including:

- 26 ads in *El Observador* Spanish weekly newspaper
- Additional distribution of donated half-page ad in KBAY's "Summer Made Simple Guide"

722 radio ads including:

- 210 spots on KBAY 94.5 FM
- 71 PSAs on KBAY
- 100 30-second tips (provided by the consultant) on KBAY's "Planet KBAY" daily green living feature
- 40 15-second promotional announcements by KBAY promoting Summer Made Simple Guide with Watershed Watch mention
- 30 15-second KBAY promotional announcements for Car Wash events
- 208 spots on KSJO/KCNL (La Preciosa 92.3 / 104.9 FM)
- 48 spots on KBRG (Recuerdo 100.3 FM)
- 15 PSAs on KBRG, KSOL and KVVF

50 VTA bus tails:

- 33 paid bus tails in Santa Clara County
- 17 bonus bus tails in Santa Clara County
- 2 weeks early installation for bonus coverage of 50 bus tails

3,054 cable television ads:

- Comcast Spotlight in Silicon Valley Zone, San Jose Zone and South Peninsula Zone (covering entire SCVURPPP area without waste)
- Networks included:
    - TLC "The Learning Channel"
    - Comedy Central
    - Comcast Sports Bay Area
    - Discovery Channel
    - ESPN
    - FX
    - SYFY Science Fiction
    - TBS
    - TNT
- 1,456 paid spots
- 1,598 PSAs

Internet (purchased) media:

- 5 months site-wide rotation on KCNL www.LaPreciosa.com
- 11,344,625 impressions on Facebook.com
- 525,369 impressions on Google.com (AdWords)
- 200,000 impressions on Yahoo.com

Internet added-value ads that the Campaign received from media partners:

- 9 months banner ads on www.el-observador.com
- 10 weeks on www.kbay.com with tile ad on all pages
- 10 weeks on KBAY Cares page
- 52 weeks on KBAY Advertisers page
- 3 weeks on KBAY Event page (Car Wash events)
- 12 weeks on KBAY Summer Made Simple page (including the Watershed Watch ad in the online version of the Summer Made Simple guide)
- 1 email blast to KBAY.com e-newsletter subscribers for Earth Day
- 4 months banner and tile ads on Comcast.net (550,000 impressions)
- 50,000 impressions on MercuryNews.com, tile ad on Breaking News page April through June

The following shows estimated gross impressions during the fiscal year:

KBAY	Adults 35+	4,561,960
El Observador	Adults 25+	519,974
KSJO/KCNL	Hisp. Adults 18+	553,600
KBRG	Hisp. Adults 35+	210,174
VTA Bus Tails	Santa Clara County	1,884,000
Comcast Spotlight	Adults 35+	2,793,968
Comcast.net	Geo-targeted	550,000
Facebook.com	Persons 16+	11,344,625
Google.com	Geo-target/keyword	525,369
MercuryNews.com	All viewers	50,000
Yahoo.com	Homeowners 35+	200,000
Total Gross Impressions		***23,193,670**

** Figure does not include unverified gross impressions on California's Great America billboard (not confirmed for FY 09-10), or impressions on www.kbay.com, www.El-Observador.com, or www.lapreciosa.com*

The following table describes the media costs and estimated value-added obtained from media advertising.

Program Funded Media Buy

MEDIA	TOTAL COST	VALUE ADDED (minimum)	TOTAL VALUE
KBAY 94.5 FM	$ 19,950	$ 62,000	$ 81,950
KBRG FM	$ 5,280	$ 1,650	$ 6,930
KSJO 92.3 FM KCNL 104.9 FM	$9,760	$ 1,600	$ 11,360

LaPreciosa.com	$750	$ 750	$ 1,500
Comcast Spotlight	$ 28,713.79	$ 42,141.58	$ 70,855.37
VTA Transit/Lamar	$ 7,012.50*	$ 13,218.75	$ 17,231.25
Bay Area News Group (Yahoo.com + MercuryNews.com)	$ 2,000	$ 1,000	$3,000
Facebook.com	$ 1,948.91	$ 0	$ 1,948.91
Google AdWords	$ 697.05	$ 0	$ 697.05
El Observador	$ 4,290	$ 7,045	$ 11,335
TOTAL	**$ 80,402.25****	**$ 129,405.33**	**$ 209,807.58**

*Includes $3000 co-permittee contributions.
**Total amount is lower than the budgeted amount for media as some scheduled Comcast Spotlight did not run (pre-empted) during the political advertising period and could not be made up before the end of the fiscal year because inventory was not available. Additional budget was allocated to creative development for VTA bus tails and television production time and expenses that exceeded original estimates.

Creative messages breakdown (Program-funded media):

	IPM	Green Gardener	Litter	Car Wash Events	Tips/Promo General WW	Total
Radio - Paid	229	94	104	39		466
Radio - PSA	59	14		43	140	256
TV - Paid			1,456			1,456
TV - PSA			1,598			1,598
Transit - Paid			33			33
Transit - PSA			17			17
Print - Paid	17		9			26
Print - PSA	1					1
Total	**306**	**108**	**3,217**	**82**	**140**	**3,853**

Online ads are not included in ad count because they are actually purchased by month, clicks, and impressions rather than number of ads.

Task 4: Partner Development & Coordination
Existing partners were contacted and some new partnerships explored. The consultant worked at maintaining relationships with existing partners, creating new partnerships, and updated and maintained partner contact information.

Continuing Partners in the FY 09-10 included:

- City of San Jose/History San Jose (Haunted History)
- KBAY Radio
- Yamagami's Nursery
- Capitol Premier Car Wash
- Classic Car Wash (all 4 Santa Clara County locations)
- Creek Connections Action Group
- El Observador newspaper
- Comcast Spotlight Cable
- Mel Cotton's Sporting Goods
- Guadalupe River Park and Gardens
- KSJO/KCNL "La Preciosa" Radio

New or renewing Partners in the FY 09-10 included:

- KBRG Spanish Radio (New media partner)
- Yahoo.com/MercuryNews.com (New media partner)
- Valley Transit Authority (VTA) (New community partner)
- Lamar Transit (New media partner - advertising/media sales and production for VTA)
- Jiffy Lube (New community partner)
- Happy Hollow Park & Zoo (Renewing partner)

Partnerships currently under development:

- Aussie Rain Tanks – Rain collection tanks help to reduce household runoff; will offer a free gauge ($75 value) with purchase of new tanks with WW Discount Card (pending confirmation).
- Heavenly Greens - Referral from media partners; submitted proposal to the Heavenly Greens marketing agency.

Task 5: Added Value Development

As a result of media partnership negotiations and community partnership activities, the campaign received the following added value during the campaign year:

- City of San Jose, History Park –
  - Donated booth space for Haunted History event included Watershed Watch logo on all event media outreach
- Guadalupe River Park & Gardens –
  - Watershed Watch was credited as a sponsor in all Pumpkins in the Park event advertising: GRPG.org website and email newsletters; KNTV 11 NBC; KLIV/KRTY; KEZR; *San Jose Mercury News;* and 25,000 flyers distributed to school children
  - Provided survey services for ZunZun performances at Pumpkins in the Park
  - GRPG and Watershed Watch cross-promoted news and events on Facebook and Twitter (social networking)
- Capitol Premier Car Wash –
  - Ongoing discounts with Watershed Watch discount card; honored $4 discounts through the fiscal year (and committed through 12/31/10)
  - Supported June 2, 2010 Car Wash event with 50% off car washes and social networking promotion of the event
- Classic Car Wash –
  - Ongoing discounts with Watershed Watch discount card
  - 504 $4 WW discounts were redeemed, for a total of $2,016 in discount value

    - Supported May 5 and May 19 Car Wash events in which a combined 200 car washes were provided at 50% off, estimated $10 discount per vehicle for $2,000 value
    - Will honor $4 discounts through 12/31/10
- KBAY –
    - 10 weeks on www.kbay.com with tile ad on all pages
    - 10 weeks on KBAY Cares page
    - 52 weeks on KBAY Advertisers page
    - 3 weeks on KBAY Event page (Car Wash events)
    - 12 weeks on KBAY Summer Made Simple page (including the Watershed Watch ad in the online version of the Summer Made Simple guide)
    - 1 email blast to KBAY.com e-newsletter subscribers for Earth Day
    - 71 PSAs
    - 100 recorded tips (litter, Green Gardener and IPM messages provided by the Consultant) for KBAY Cares/Planet KBAY
    - Distribution of Watershed Watch discount cards on website and 1000+ cards at community events
    - Provided half-page full color ad in 2009 *Summer Made Simple Guide* distributed 600 per event throughout the summer 2009 and named Watershed Watch in 40 promotional announcements promoting the Guide
    - 3 staffed onsite events (car wash events) at no charge, supported by 30 promotional announcements plus live on-air DJ mentions. Provided giveaways and incentives at the events
    - Included Watershed Watch in Earth Day-themed email blast to 16,000 subscribers on April 7, 2010
    - Provided third-party partnership coordination with Yamagami's Nursery and Jiffy Lube
- KSJO/KCNL –
    - Provided discounted media rates and bonus rotation of WW ad on www.lapreciosa.com
- KBRG –
    - Provided 15 PSAs on KBRG, KSOL and KVVF in April 2010
    - Distributed 1,000 Spanish Discount Cards at their events
- Comcast Spotlight –
    - Matched paid spots with free spots
    - Discounted rates on media
    - Provided creative collaboration for TV concept development
    - $100 in Golfland Fun Money for use as prize incentive (will be used in FY 10-11)
    - Comcast.net ad production
    - 550,000 targeted impressions on Comcast.net
- *El Observador* Newspaper –
    - Donated online web ads 300x250 for 9 months
    - Upsized three ads, from 2x5" to 1/4 page
    - Upgraded two ads to full color
    - Published Green Gardener editorial feature
    - Distributed 1,500 Spanish Discount Cards at their events
    - Produced Litter tile ad for website rotation (under direction of Consultant)
    - Translated two IPM ads to Spanish
- Lamar Transit/VTA Bus Tails –
    - 17 bonus tails donated for 33 purchased

    - Installed nearly all 50 bus tails 2-weeks early (bus ads entered rotation for 2 bonus weeks of media coverage)
- Yamagami's Nursery –
    - Offered 25% off featured "Green" gardening product each month with Watershed Watch discount card
    - Featured WW discount card offer on their website home page
- Creek Connections Action Group –
    - Campaign promoted the Cleanup Day events by posting information on the Watershed Watch website
    - Campaign promoted the National River Clean-up Day on the Campaign website, Facebook page and Twitter
- Mel Cotton's Sporting Goods –
    - Provided ongoing discounts to customers; 10% off total purchase with the WW Discount Card
- Yahoo.com/MercuryNews.com –
    - Provided production assistance for Yahoo.com (under direction from the Consultant)
    - Production of logo tile ad and 50,000 impressions on MercuryNews.com as added-value
- VTA –
    - Will donate part of their allocation of interior transit card space to WW (Campaign provides production) in Summer 2010
    - Coordinated approval of WW creative for production
- Jiffy Lube –
    - Offers a $10 discount on Signature Oil Change Service with WW Discount Card
- Happy Hollow Park & Zoo –
    - A previously existing partnership underwent hiatus during HHPZ closure for renovation. Partnership is back on track for 2010 with installation of the Watershed Watch interpretive display (following renovation) and other activities to be determined

Minimum estimated value-added provided to the Campaign from media and community partners July 2009 - June 2010 is $133,521.

Task 6: Website Maintenance & Development

Website Design
The original Campaign website had become outdated in style and function (especially navigation). The FY 09-10 work plan allowed for a new website design and development.

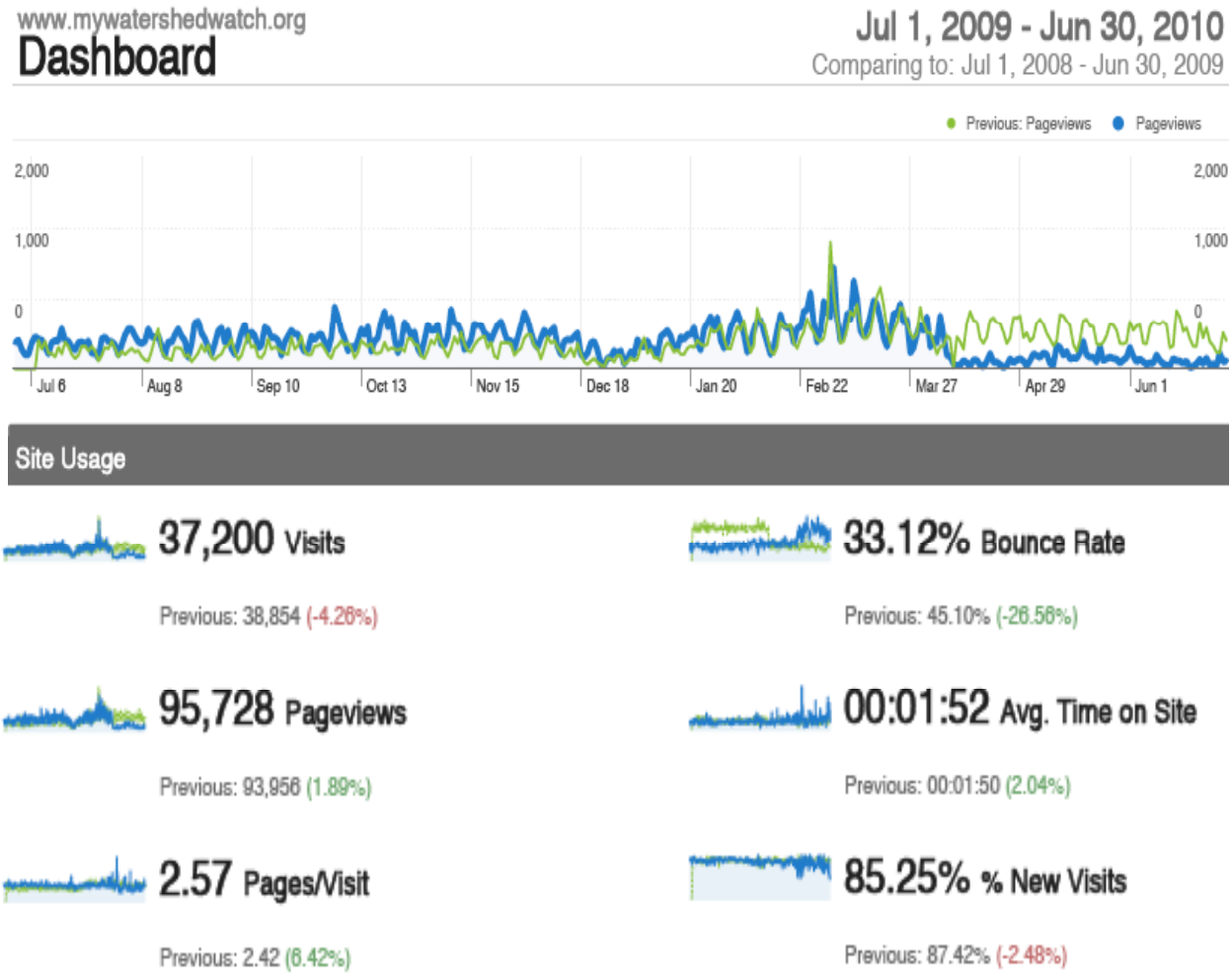
- Co-permittee volunteers formed a work group to suggest features, needs, functions, design aesthetics, and content.
- Page styles were designed, reviewed and revised to meet sub-committee approval.
- Site index (content outline) was developed, reviewed and revised to meet sub-committee approval.
- Existing content from Campaign website was copied, updated and adapted to fit the new site index, and implemented into the template page design.
- Upon completion, the new site was uploaded "live" on April 5, 2010 and re-registered with search engines.
- Continuing through April, pages were reviewed and edited as needed to meet approval.
- Upon completion of the English site, the Spanish site was developed and implemented to complement the English site. The Spanish site went live in May 2010.

- The resulting site has fewer pages, more features, and has eliminated redundant attachments for a more streamlined site with more direct navigation to frequently sought information.
- Ongoing adjustments continued through the campaign year, and regular updates were made to the new site to keep content current and correct.

Website Maintenance
Throughout the fiscal year, the consultant performed ongoing updates to the website to keep information current and applicable to the new creative, partnerships and Co-permittee news and events.

Website Activity
The website was promoted in print, radio, television and online, as well as on Campaign materials and promotional items handed out at community events.

The activity on the site has been tracked by page views, which are the total/gross number of hits to the site. The graph illustrates the average daily page views by month, July 1, 2009 through June 30, 2010, with a direct comparison against the previous year.



Traffic Sources
Visitors arrived at the site by way of:

- 8.14% direct traffic
    - 3,021 visitors typed in "mywatershedwatch.org" (#3 traffic source overall)
- 22.47% referring sites (other sites linked to mywatershedwatch.org)
    - learn.flvs.net (#2 traffic source overall)
    - paguito.com
    - facebook.com
- 69.38% search engines (organic searches)
    - Google (#1 traffic source overall)
    - Search.com
    - Bing
    - Yahoo

Top Content
Most frequently visited pages on the site:

1. **"/description_Spanish.html"** – Spanish "All About Watersheds" page
2. **"/description.html"** – English "All About Watersheds" page
3. **"/IPM_Problems_Solutions_Sp.htm"** – Spanish IPM Problems & Solutions page, linked from the main Spanish "Got Bugs" or IPM (MIP) page
4. **"/IPM_Index_Sp.htm"** – Spanish "Got Bugs" page, also known as "El Manejo Integrado de Plagas (MIP)"
5. **"/"** – Watershed Watch home page
6. **"/important_Spanish.htm"** – Spanish "Why watersheds are important"
7. **"/Education_Spanish.htm"** – Educators' page in Spanish
8. **"/important.htm"** – English "Why watersheds are important"
9. **"/index.htm"** – Watershed Watch home page (old site)
10. **"/aboutwatersheds.html"** – "About Watersheds" on the new site

Please note that some of these page names belonged to pages on the old site and those pages no longer exist, although the subject matter is available on the new site under new page names.

Key Words
During the April-June Google AdWords campaign, the following were the top-producing key words or phrases: Roses, free activities, car wash coupon, bugs, ants, fleas, weeds, green gardener, to prevent pollution, roaches, mosquitoes, aphids, pests, snails, slugs, and a variety of combinations that include the phrases "pest control" and "water pollution."

Key words (and phrases) in organic searches that resulted in the most visits to the site were also very consistent with the results in Top Content: cuencas hidrgraficas/cuenca hidrografica, mip, importancia de las cuencas hidrografica (several variations on this phrase), venero para hormigas, why watersheds are important, watershed pollution, watershed watch, and importance of watersheds.

Downloads

- Estimated number of downloads from July 2009 - June 2010 was 15,897, compared to 17,580 in FY 08-09.

- Average number of downloads per month was 1,325, compare to 1,465 in FY 08-09 and 1,290 in FY 07-08.
- The decline in downloads from the previous year is likely attributed to the period of time between launching the new English site and the new Spanish site (when Spanish was temporarily unavailable) and the period of time it takes for a new site to propagate the web for search engines to find it.
- Most popular downloads included Watershed Watch Discount Card, Public Participation/Volunteer Opportunities list, Thermometer Exchange Event Calendar, Spanish Roses fact sheet, Good Bug Tub fact sheet, Business Fluorescent Light article, Spanish Ants (Hormigas) fact sheet, Kids Guide to Backyard Bugs, and Zun Zun flyer.
- Other notable downloads in the top 20 are the WW Brochure in English and Vietnamese, the Pool Brochure, and IPM fact sheets.

Task 7: Outreach Events

The consultant researches and evaluates new event opportunities, registers for approved events, and maintains an events worksheet with general information for all scheduled events.

The consultant staffed five community outreach events: Haunted History in History Park San Jose, October 31, 2009; Classic Car Wash Events in San Jose and Campbell, May 5 and May 19, 2010; Capitol Premier Car Wash Event in San Jose on June 2, 2010; and Festival in the Park at Hellyer Park, San Jose on June 26, 2010. Co-permittee and Program staff provided additional staffing.

Materials distributed at these events included Our Water Our World fact sheets, Grow It Guides, flyswatters, note pads, temporary tattoos, “Pest or Pal” activity books, “10 Most Wanted” brochure, the new Watershed Watch “You are the Solution” brochures (English and Spanish), “Draining Pools and Spas” brochure, “Clean Cars & Clean Creeks” brochure, and Watershed Watch Discount Cards.

The Watershed Watch Campaign booth was present at the following events in July 2009 through June 2010:

Pumpkins in the Park, Guadalupe River Park & Gardens (GRPG), October 10, 2009

- The Program sponsored 2 ZunZun performances for the event
- Attendance was estimated at 12,000-14,000
- Audience was families with children
- GRPG staff conducted a survey at the event to evaluate the ZunZun performance. A total of 45 surveys were collected. After the ZunZun performance, 96% could understand the concept of watersheds
  - 64% had knowledge of watersheds prior to the performance
  - 80% felt they could name ways to prevent pollution in the watershed including:
    - Keep pesticides and household products from entering runoff
    - No soapy water in the street
    - No dumping in the storm drain
    - Use reusable bags (not plastic)
    - Recycle
    - Don’t litter
    - Save water (turn off while brushing teeth, use less bath water)

Muslim Green Fair – Muslim Community Center, Santa Clara, October 18, 2009

- Attendance at this event was estimated at 1,000
- Audience was families with children

Haunted History – History Park, San Jose (replaced Haunt the Hollow event during Happy Hollow Park & Zoo remodeling), October 31, 2009

- Attendance at this event was estimated at 1,500
- Audience was families with children
- 279 promotional outreach and informational items were distributed, along with a lot of Halloween candy

Spring Garden Market – History Park, San Jose, April 3, 2010

- Estimated attendance of event was 3,000
- Estimated that attendance was lower than previous years (around 4,000) because of inclement weather.
- Audience was gardening enthusiasts

NVIDIA Corp. Earth Day Event – NVIDIA, Santa Clara, April 22, 2010

- Estimated attendance of event was 500
- Audience was NVIDIA employees

Spring in Guadalupe Gardens – Guadalupe River Park and Gardens, San Jose, April 24, 2010

- Estimated attendance of event was 4,500
- Audience was gardening and outdoor enthusiasts

Robertsville Classic Car Wash – Almaden Expressway, San Jose, May 5, 2010

- Estimated attendance of event was 150
- Included an onsite promotion with KBAY radio

Delta Queen Classic Car Wash – Hamilton Avenue, San Jose, May 19, 2010

- Estimated attendance of event was 45
- Included an onsite promotion with KBAY radio

Capitol Premier Car Wash – Capitol Expressway Auto Mall, San Jose, June 2, 2010

- Estimated attendance of event was 100
- Included an onsite promotion with KBAY radio

Festival in the Park – Hellyer Park, San Jose, June 26, 2010

- Estimated attendance of event was 5000
- Audience was families with children (included a large number of Spanish-speaking residents).
- Event focused on health and wellness

Task 8: Public Relations

Public Relations (PR) efforts are described below:

- Santa Clara Valley *Green Gardener* Training Program Recruitment for fall classes; PR outreach
    - Media outreach to *El Observador*; announcement ran in September 25, 2009 publication
- BASMAA Pesticide Press Release
    - Reviewed and provided suggested edits
- Social networking media
    - Developed social networking strategy and recommendations
    - Established Twitter and Facebook accounts on behalf of Campaign
    - Researched and reported regarding Facebook Groups vs. Pages
    - Developed Facebook Page
    - Implemented Twitter and Facebook posts
    - Connected with Pages for Campaign partners and related Bay Area organizations
    - Implemented ongoing updates to Facebook page
    - Sought new Page fans through social networking and paid advertising on Facebook
    - Established personalized URLs for Campaign Facebook account and Facebook Page

Task 9: FY 10-11 Work Plan Development
The consultant developed the FY 10-11 work plan and media plan.

Reports & Meetings
The consultant attended WEO AHTG meetings as needed. Time was not billed for attendance or travel/expenses; participation was donated to the campaign as value-added.

The consultant developed a social networking overview presentation for the Management Committee.

The consultant provided monthly reports, invoices, partnership updates, and web statistics, and a mid-year campaign report with recommendations. In addition, the consultant developed social networking reports/recommendations including a social networking overview presentation to the management committee, and support for a media presentation was provided.

Evaluation of Effectiveness:
The following is a summary of the measurable results of the Campaign from July 2009 through June 2010:

- Established social networking presence and achieved 300 Facebook Fans and15 followers on Twitter.
    - Social networking is a public relations activity that provides an additional way to deliver direct messages to the target audience.
    - It resulted in just 277 visits to the Watershed Watch website (through ads and the Page), but the Campaign's Facebook Page itself received an estimated 4,500 visits.
    - Paid ads on Facebook resulted in the majority of the Fans who now follow the Page, since the primary focus of our paid ad campaign was to establish a relevant Fan base.
- Two new partnerships were added and one previous partner renewed after a hiatus. In addition, several key contacts have been made for other potential new partners.
- Media advertising delivered a minimum of 23,193,670 in targeted gross impressions.

- The media partners provided a minimum added value package of benefits and resources of $129,405 in addition to the $80,402 spent YTD on advertising.
- Total (measured/realized) Value Added Resources from media and community partners: $133,521.
- Number of web page views: 95,728
- Number of requests on the website for Watershed Watch brochure and other materials: 27
- Number of IPM or other queries: 18
- Hotline Calls: 20
- Number of WW Discount Cards used at Classic Car Wash:
    - 504 discounted car washes ($2,016 in value)
    - Compare to FY 08-09: $420 discount value; 105 total customer discounts (480% increase!)

Recommendations for the FY 10-11 Campaign

- Continue to maximize existing partnership opportunities with promotional and outreach events geared toward public participation and awareness, and for additional outreach and awareness.
- Continue developing new partnerships to increase resources and outreach opportunities, and to provide practical applications for the public to reduce urban runoff pollution.
- Promote website through online ads, social networking and paid media.
- Include Twitter and Facebook logo (and URL where space allows) in newly produced printed items to increase public awareness and participation in social networking with the Campaign.
- Implement direct messages to Facebook Fans, and directly to Watershed Watch email list through Constant Contact, a popular online contact management system that provides personalized and customized HTML emails without showing up as spam. Since the launch of the new site, the Campaign has received 13 requests for email updates through the "Contact" form, usually in concert with requests for a brochure and/or Discount Card.
- Future Facebook paid ad campaigns can promote more Watershed Watch direct calls to action such as downloading a Discount Card or other incentives to visit and interact with the Watershed Watch website (such as a contest or survey utilizing donated prizes as incentives).
- Ideally, other ads and outreach will also promote the Watershed Watch Facebook page as well, to build a larger Fan base to increase the Campaign's social networking influence. With more than a million Facebook users in proximity of Santa Clara County, there is a large potential audience. Frequent Facebook users may be more likely to respond to a call to action to "Find us on Facebook" than they would be to visit the Campaign website.
- Continue to develop media added-value in support of Campaign partner events (van stops and live broadcasting to promote Campaign activities, contests/prizes, web ads, e-newsletters/e-mails, twitter postings, etc.).
- Utilize donated prizes for incentives in direct-response campaigns such as surveys and general awareness contests. Promote results through Facebook and on Campaign website.
- Implement social networking media strategies utilizing pre-approved messages and timely news items.
- Evaluate and adjust social networking strategies as needed.

- Plan ahead (as far in advance as possible) the messages for Univision TV editorial features to tie in with paid campaign messages. Promote and use these productions in social networking and other outreach.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 7-2

FY 09-10 Watershed Watch Partner Report

September 15, 2010

PARTNER	CONTACT	RESULTS
KUFX / KCNL / KSJO ClearChannel Radio	Kevin Kimerer 408-451-7663 kevinkimerer@clearchannel.com	Partnered through February 2010 on La Preciosa radio and web until station changed formats. Kevin provided contact information for potential partners, Heavenly Greens and Aussie Rain Tanks.
Capitol Premier Car Wash	Chuck Brassfield 408-979-7811x12	Capitol helped promote the June 2 event on Facebook and Twitter. Hosted the June 2 event with 50% off car wash services from 5-7 p.m. Provided $4 discounts on car washes on the Discount Card.
KRTY / KLIV Empire Broadcasting	Jan Bell 408-961-0443 jbell@empirebroadcasting.com	Previous media partner, provided FY 08-09 final report data and FY 10-11 media proposals.
KEZR / KBAY	Janna Hathaway janna@kbay-kezr.com	Media partner, provided added value in radio, print and web media, partnership coordination with Yamagami's Nursery and Jiffy Lube for Discount Cards. Presented Discount Card opportunity to entire sales team to solicit partners on our behalf. Distributed Discount Cards at events, and provided car wash event support.
Yamagami's Nursery	(Via KBAY)	Offered 25% off monthly featured "Green" product with WW Discount Card, and featured WW on their website home page.
Don Edwards SF Bay Wildlife Refuge at Alviso	Genie Moore 408-262-5513 x100 Genie_Moore@fws.gov	SCVURPPP supports education at the Wildlife Refuge. WW refers individuals to the Refuge for volunteer opportunities and promotes events and activities at the Refuge on the Campaign website. Recommended promotion of the Alviso Ed Center to EcoMetroGuide and KBAY's Summer Made Simple.
Guadalupe River Park & Gardens	Phil Cornish 408-298-7657 phil@grpg.org	Provides WW with sponsorship of Pumpkins in the Park event in exchange for ZunZun performances. WW also participates in Spring in Guadalupe Gardens, and cooperates with GRPG to promote these events on the website and through social networking.
El Observador Newspaper	Angelica Rossi	Media partner; provided discounted rates, upsized and added color as added value when possible; assisted with ad translation and provided basic web ad design services when needed. Ran WW ads on their website as added value, and distributed Spanish Discount Cards at community events.
Classic Car Wash (corporate)	Marty Jensen (408) 371-2414 x 216	Provided $4 discounts at all locations throughout the year, tracked responses and provided information to the Campaign. Hosted two Car Wash events 5/5 and 5/19 with 50% off car wash services from 7-9 a.m.
California's Great America	Jim Stellmack (408) 986-5841 jim.stellmack@cagreatamerica.com	Previous partner; did not respond to messages requesting rotation in Great America's electronic billboard or other requests for partnership opportunities.
Creek Connections Action Group	Kate Slama	Campaign supported outreach for Clean Up days / events on Campaign website and in social networking.
Santa Clara County HHW Program (co-permittee)	Rob D'Arcy (408) 918-1967 Rob.Darcy@deh.sccgov.org	Campaign promotes hhw.org for proper disposal of household hazardous waste.
BASMAA	Geoff Brosseau geoff@brosseau.us	Campaign reviewed and commented on media outreach for spring gardeners.
Childrens Discovery Museum	Sandy Derby (408) 298-5437x261 sderby@cdm.org	CDM has education program for watershed and water pollution prevention; sponsors teams for Creek Clean Up days. Campaign requested distribution of "Solution to Water Pollution" brochure and additional partnership activities but did not receive response to messages.
Santa Clara County Parks and Recreation Dept.	Tamara Clark-Shear (408) 355-2215 tamara.shear@park.sccgov.org	Campaign participated in Festival in the Park. Followed up with suggestions/queries for 2011 event.
Stevens & Permanente Creeks Watershed Council	Mondy Lariz (408) 356-8258 ed@spcwc.org	Websites linked; Campaign promotes volunteer opportunities through the website.
Happy Hollow Park & Zoo	Vanessa Rogier (408) 277-3065 vanessa@bayarea.net	Previous partner; Consultant and Vanessa had a dynamic meeting shortly after the reopening. Examined the condition of WW interpretive display, discussed rennovation and placement of sign in the Zoo, and other partnership opportunities including Discount Card, events, Green Gardener Program, Facebook, more.
Mel Cotton's Sporting Goods	China (Chris) (408) 287-5994 china@melcottons.com	Offers a 10% discount on purchases with the Discount Card.
Heavenly Greens	Troy Scott troy@heavenlygreens.com 866.518.7888	Potential partner; seemed interested in the partnership.
Comcast Spotlight Cable	Matthew Ryan (408) 291-3977	Media partner; provided discounted rates, PSAs, creative meeting, and online creative and media as added value. Provided $100 in GolfLand fun money ($10 x 10) to be used in FY 10-11 as an incentive.
MercuryNews.com **Yahoo.com**	Lauren Jacob Dody Gerick	Media partner; provided creative support for the car wash events. Ran Tile ads on mercurynews.com breaking news page as value-added to the Yahoo.com campaign.
Valley Transit Authority	Dino Guevarra (408) 321-5527	Lamar transit installed most of the bus tails 2 weeks early which delivered extra impressions at no extra cost to the campaign. Dino agreed to a 4-week full run of interior bus and lightrail cards in partnership with the Campaign (for FY 10-11)
KSOL / Univision Radio SF **KBRG**	Jose Serrano Marisa	Media partner; provided discounted rates and PSAs as added value. Distributed Spanish Discount Cards at community events in Spring 2010.
Aussie Rain Tanks	Bruce Hallinan bruce@aussieraintanks.com (408)796-7511	Potential partner; expressed he was very pleased to be part of the campaign but did not follow through. May offer a free wireless gauge with any installation as part of the Discount Card program for 2010.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 7-3

FY 09-10 Watershed Watch Web Statistics

September 15, 2010

FY 09-10 Watershed Watch Website Statistics

Date	Avg. Page Views/ day	Top pages	No. of Top Pages	Top Search Engine Referrals	Most Downloaded Pages	Contact Form Requests	WW Brochure Requests	Comments
July 09	234	/description_Spanish.htm /IPM_Problems_Solutions_Sp.htm /description.htm /IPM_Index_Sp.htm /important_Spanish.htm /Education_Sp.HTM / (home page) /index_Spanish.htm /important.htm /Partners_Spanish.htm	English -3 Spanish -7	Google learn.flvs.net paguito.com 5.53% direct 21.14% referral 73.33% search engines	1. WW Discount Card 2. Good Bug Tub Fact Sheet 3. Public Participation Opportunities 4. Watershed solutions brochure 5. GG flyer in English 6. GG flyer in Spanish 7. Snails and Slugs Fact Sheet 8. "Got Bugs" archive ad 9. Roses Fact Sheet 10. Watershed Project Spring Workshop Brochure	English – 1 Spanish – 0	English - 0 Spanish - 0	
August 09	282	/description_Spanish.htm /description.htm /IPM_Problems_Solutions_Sp.htm /IPM_Index_Sp.htm / (home page) /important_Spanish.htm /Education_Sp.HTM /index.htm /index_Spanish.htm /FAQ.htm	English -4 Spanish -6	Google Yahoo Bing Ask 4.55% direct 21.68% referral 73.77% search engines	1. WW Discount Card 2. Public Participation Opportunities 3. Roses Fact Sheet 4. Thermometer calendar 5. Good Bug Tub Fact Sheet 6. Yellow Jackets Fact Sheet 7. Lawns Fact Sheet 8. Watershed Solutions Brochure 9. Mercury Article 10. Rats & Mice Fact Sheet	English – 0 Spanish – 0	English - 0 Spanish - 0	Peak activity 8/24-25 (446 and 461 page views) coinciding with start of KBAY radio campaign

Date	Avg. Page Views/ day	Top pages	No. of Top Pages	Top Search Engine Referrals	Most Downloaded Pages	Contact Form Requests	WW Brochure Requests	Comments
Sept 09	284	/description_Spanish.htm /IPM_Problems_Solutions_Sp.htm /description.htm /IPM_Index_Sp.htm /Education_Sp.HTM / (home page) /important_Spanish.htm /index_Spanish.htm /index.htm /important.htm	English -4 Spanish -6	Google Yahoo Bing 5.42% direct 17.24% referral 77.34% search engines	1. WW Discount Card 2. Public Participation Opportunities 3. Thermometer calendar 4. Roses Fact Sheet 5. Good Bug Tub Fact Sheet 6. Call for Field Testers 7. Watershed Solutions Brochure 8. Yellow Jackets Fact Sheet 9. Roaches Fact Sheet Spanish 10. Kids Guide to Backyard Bugs	English – 1 Spanish – 0	English - 0 Spanish - 0	
Oct 09	320	/description_Spanish.htm /description.htm /IPM_Problems_Solutions_Sp.htm /IPM_Index_Sp.htm /important_Spanish.htm /Education_Sp.HTM /important.htm / (home page) /index_Spanish.htm /index.htm	English -4 Spanish -6	Google Yahoo Bing 5.06% direct 15.85% referral 79.09% search engines	1. Public Participation Opportunities 2. WW Discount Card 3. Thermometer calendar 4. Good Bug Tub Fact Sheet 5. Business Mercury article 6. Roses Fact Sheet 7. Healthy Garden Fact Sheet 8. Litter Ad (old campaign) 9. IPM Newsletter Article 10. Watershed Solutions Brochure _ Spanish	English – 2 Spanish – 0	English - 1 Spanish - 0	

Date	Avg. Page Views/ day	Top pages	No. of Top Pages	Top Search Engine Referrals	Most Downloaded Pages	Contact Form Requests	WW Brochure Requests	Comments
Nov 09	343	/description_Spanish.htm /description.htm /IPM_Problems_Solutions_Sp.htm /IPM_Index_Sp.htm /important_Spanish.htm /Education_Sp.HTM /important.htm / (home page) /FAQ.htm /index_Spanish.htm	English -4 Spanish -6	Google Bing Yahoo Ask 4.86% direct 19.45% referral 75.64% search engines	1. Lawns Fact Sheet 2. Public Participation Opportunities 3. WW Discount Card 4. Roses Fact Sheet 5. ZunZun flyer 6. Good Bug Tub Fact Sheet 7. WWBrochure_Vietnamese 8. Thermometer Calendar 9. Hormigas (Ants) SP Fact Sheet 10. Kids Guide	English – 3 Spanish – 0	English - 1 Spanish - 0	
Dec 09	235	/description_Spanish.htm /description.htm /IPM_Problems_Solutions_Sp.htm /IPM_Index_Sp.htm / (home page) /important.htm /important_Spanish.htm /Education_Sp.HTM /index.htm (home page) /downloads/map	English -5 Spanish -5	Google Search Yahoo Bing 4.74% direct 29.66% referral 65.6% search engines	1. WW Discount Card 2. Public Participation Opportunities 3. ZunZun flyer 4. Thermometer Calendar 5. WWBrochure_Vietnamese 6. Roses Fact Sheet 7. Good Bug Tub Fact Sheet 8. Pests IPM Fact Sheet 9. Hormigas (Ants) SP Fact Sheet 10. WW Brochure low res	English – 0 Spanish – 0	English - 0 Spanish - 0	Activity notably slowed as the holidays neared, and through the holidays (Christmas to New Years Day)

Date	Avg. Page Views/ day	Top pages	No. of Top Pages	Top Search Engine Referrals	Most Downloaded Pages	Contact Form Requests	WW Brochure Requests	Comments
Jan 10	275	/description_Spanish.htm /IPM_Problems_Solutions_Sp.htm /description.htm /IPM_Index_Sp.htm /important_Spanish.htm / (home page) /Education_Sp.HTM /important.htm /Downloads_Sp.HTM /FAQ.htm	English -4 Spanish -6	Google Search Yahoo Bing 6.19% direct 24.91% referral 68.87% search engines	1. Public Participation Opportunities 2. WW Discount Card 3. ZunZun flyer 4. Roses Fact Sheet (SP) 5. Good Bug Tub Fact Sheet 6. Hormigas (Ants) SP Fact Sheet 7. Pests IPM Fact Sheet 8. Fluorescent light disposal 9. WWBrochure_Vietnamese 10. Cars pollute ad	English – 1 Spanish – 0	English - 0 Spanish - 0	Increasing activity from the beginning of the month to the end of the month (trending upward)
Feb'10	390	/description_Spanish.htm /description.htm /IPM_Problems_Solutions_Sp.htm /important_Spanish.htm /IPM_Index_Sp.htm / (home page) /important.htm /Education_Sp.HTM /index.htm /news.htm	English -5 Spanish -5	Google Search Yahoo Bing 6.2% direct 18.39% referral 75.41% search engines	1. WW Discount Card 2. Public Participation Opportunities 3. Roses Fact Sheet (SP) 4. ZunZun flyer 5. Green Gardener Spring Class Flyer 6. Good Bug Tub Fact Sheet 7. Pools Brochure 8. Green Gardener Spring Class Flyer (SP) 9. Litter ad 10. Car Wash Brochure	English – 0 Spanish – 0	English - 1 Spanish - 0	Most site activity in the year so far. Highest levels during week of 2/22 which coincides with the posting of our TV spot on GRPG's Facebook page. 732 page views on Thurs. 2/25.

Date	Avg. Page Views/ day	Top pages	No. of Top Pages	Top Search Engine Referrals	Most Downloaded Pages	Contact Form Requests	WW Brochure Requests	Comments
Mar'10	470	/description_Spanish.htm /description.htm /IPM_Problems_Solutions_Sp.htm /important_Spanish.htm /index.htm /IPM_Index_Sp.htm / (home page) /important.htm /Education_Sp.HTM /watershed/index.htm	English -5 Spanish -5	Google Yahoo Bing Ask 13.92% direct 14% referral 72.08% search engines	1. WW Discount Card 2. Roses Fact Sheet (SP) 3. Public Participation Opportunities 4. Green Gardener Spring Class Flyer 5. Pools Brochure 6. Green Gardener Spring Class Flyer (SP) 7. ZunZun flyer 8. Good Bug Tub Fact Sheet 9. Fleas Fact Sheet (SP) 10. Car Wash Brochure	English – 4 Spanish – 0	English - 0 Spanish - 0	Another good month for web activity. Notable increase in direct site activity, possibly a result of TV campaign.
April 10	124	/ (home page) /description_Spanish.htm /IPM_Problems_Solutions_Sp.htm /description.htm /index.htm /aboutwatersheds.htm /events.html /form/contact/contactform.htm /whyimportant.html /watershed/index.htm	English -8 Spanish -2	Google MasterGardeners Google CPC Search Comcast.net 27.17% direct 24.72% referral 48.11% search engines	1. Roses Fact Sheet (SP) 2. Good Bug Tub Fact Sheet 3. WW Solutions Brochure Vietnamese 4. Public Participation Opportunities 5. ZunZun Flyer 6. WW Solutions Brochure Spanish 7. Pools Brochure 8. Roses Ad 9. Weeds Fact Sheet 10. Kids Guide	English – 1 Spanish – 0	English - 6 Spanish - 0	Launched newly designed site April 5, without Spanish, impacting site activity for the month.

Date	Avg. Page Views/ day	Top pages	No. of Top Pages	Top Search Engine Referrals	Most Downloaded Pages	Contact Form Requests	WW Brochure Requests	Comments
May 10	120	/ (home page) /aboutwatersheds.htm /events.html /index.htm /whyimportant.html /discountcard.html /findgardener.html /form/contact/contactform.htm /lesstoxicgarden.html /faqs.html	English -10 Spanish -0	Google Yahoo Search 57.72% referral 24.24% search engines 18.04% direct	1. Discount Card 2. Roses Fact Sheet (SP) 3. WW Solutions Brochure Vietnamese 4. Good Bug Tub Fact Sheet 5. Car Wash Brochure 6. Public Participation Opportunities 7. WW Solutions Brochure Spanish 8. Aphids Fact Sheet 9. WW Solutions Brochure 10. ZunZun Flyer	English – 1 Spanish – 0	English - 7 Spanish - 0	Spanish launched mid-month. Checking to determine cause of drop in Google search activity, which accounts for nearly all decrease in site activity.
June 10	73	/aboutwatersheds.htm / (home page) /whyimportant.html /findgardener.html /faqs.html /events.html /discountcard.html /Sppollutiontips.html /index.html /4residents.html	English -9 Spanish -1	Google Yahoo (learn.flvs.net, facebook.com & mercurynews.com for referrals) 55.97% referral 30.35% search engines 13.68% direct	1. IPM Product List 2. Roses Fact Sheet (SP) 3. Good Bug Tub Fact Sheet 4. WW Solutions Brochure Vietnamese 5. WW Discount Card 6. WW Solutions Brochure Spanish 7. WW Solutions Brochure 8. Public Participation (Volunteer) Opportunities 9. Roaches Fact Sheet (SP) 10. Fleas Fact Sheet	English – 4 Spanish – 0	English - 11 Spanish - 1	Re-registering withe search engines to be sure we're listed properly.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 7-4

MC Contact List and Construction Inspection, IND and IDDE Contact List

- Management Committee Representatives/Attendees
- Construction, Illegal Discharge, and Industrial Inspection Contacts

Santa Clara Valley Urban Runoff Pollution Prevention Program (Management Committee Representatives/Attendees)

Organization	Contact	Address	Phone/Fax	E-mail
Campbell	*Bill Helms	70 North First Street Campbell, CA 95008-1423	tel 408-866-2153 fax 408-376-0958	billh@cityofcampbell.com
Cupertino	*Cheri Donnelly	10300 Torre Avenue Cupertino, CA 95014	tel 408-777-3242 fax 408-777-3333	cherid@cupertino.org
Los Altos	*Larry Lind	One North San Antonio Road Los Altos, CA 94022-3087	tel 650-947-2624 fax 650-947-2732	llind@losaltosca.gov
Los Altos Hills	*Richard Chiu John Chau	26379 Fremont Road Los Altos Hills, CA 94022	tel 650-941-7222 fax 650-941-3160	rchiu@losaltoshills.ca.gov jchau@losaltoshills.ca.gov
Los Gatos	*Todd Capurso	41 Miles Ave or P.O. Box 949 Los Gatos, CA 95031	tel 408-399-5770 fax 408-354-8529	tcapurso@losgatosca.gov
Milpitas	*Kathleen Phalen Paramjit Uppal	455 East Calaveras Boulevard Milpitas, CA 95035	tel 408 586-3345 tel 408-586-3351 fax 408-586-3305	kphalen@ci.milpitas.ca.gov puppal@ci.milpitas.ca.gov
Monte Sereno	*Brian Loventhal	18041 Saratoga-Los Gatos Rd. Monte Sereno, CA 95030	tel 408-354-7635 fax 408-395-7653	bloventhal@montesereno.org
Mountain View	*Eric Anderson	500 Castro Street, City Hall, 4th Floor Mountain View, CA 94303	tel 650-903-6225 fax 650-903-6122	eric.anderson@mountainview.gov
Palo Alto	*Joe Teresi Phil Bobel	250 Hamilton Ave., 6th Fl Palo Alto, CA 94301 City of Palo Alto, PO Box 10250, Palo Alto, 94303	tel 650-329-2129 fax 650-329-2299 tel 650-329-2285 fax 650-494-3531	joe.teresi@cityofpaloalto.org phil.bobel@cityofpaloalto.org
San José	*Melody Tovar Elaine Marshall James Downing	Environmental Services Department Watershed Protection, City of San Jose 170 West San Carlos Street San José, CA 95113	tel 408-277-3892 tel 408-277-5697 tel 408-277-2765 fax 408-277-5775	melody.tovar@sanjoseca.gov elaine.marshall@sanjoseca.gov james.downing@sanjoseca.gov
Santa Clara	*Dave Staub	CSC Street Corp. Yard 1700 Walsh Avenue Santa Clara, CA 95052	tel 408-615-3086 fax 408-988-0237	dstaub@santaclaraca.gov
Santa Clara County	*Clara Spaulding	Santa Clara Co. Development Services Office 70 West Hedding, East Wing, 7th Floor San José, CA 95110	tel 408-299-5737 fax 408-279-8537	clara.spaulding@pln.sccgov.org
Santa Clara Valley Water District	*Ann Draper Brett Calhoun	5750 Almaden Expressway San José, CA 95118	tel 408-265-2607 Ann X2665; Brett X2653 fax 408-979-5618	adraper@valleywater.org jcalhoun@valleywater.org
Saratoga	*John Cherbone Kristen Borel	13777 Fruitvale Avenue Saratoga, CA 95070	tel 408-868-1244 tel 408-868-1253 fax 408-868-1281	jcherbone@saratoga.ca.us kborel@saratoga.ca.us
Sunnyvale	*Lorrie Gervin Kristy McCumby-Hyland	City of Sunnyvale P.O. Box 3707 Sunnyvale, CA 94088	tel 408-730-7268 tel 408-730-7274 fax 408-747-1139	lgervin@ci.sunnyvale.ca.us kmccumby@ci.sunnyvale.ca.us
West Valley Communities	*Kelly Carroll	West Valley Clean Water Program 18041 Saratoga Los Gatos Road Monte Sereno, CA 95030	tel 408-354-4734 cell 408-318-4093 fax 888-5456-6297	kcarroll@wvcwp.org
CLEAN South Bay	Trish Mulvey	527 Rhodes Drive Palo Alto, CA 94303	tel 650-326-0252 fax 650-326-8919	mulvey@ix.netcom.com
SCVURPPP	Adam Olivieri Chris Sommers John Fusco	1410 Jackson Street Oakland, CA 94612	tel 510-832-2852 Adam X115; Chris X109; John X130 fax 510-832-2856	awo@eoainc.com csommers@eoainc.com jrfusco@eoainc.com
SCVURPPP	Jill Bicknell Vishakha Atre	111 W. Evelyn Avenue Sunnyvale, CA 94086	tel 408-720-8811 fax 408-720-8812 1-800-794-2482	jcbicknell@eoainc.com vatre@eoainc.com

* Current Voting Members

SCVURPPP Construction, Illegal Discharge, and Industrial Inspection Contacts

Agency	Construction Inspection	Illegal Discharge	Industrial Inspection
Campbell	**Alan Hom** 408-866-2168 alanh@ci.campbell.ca.us **Bill Helms** (Susan Morgado-Gray) 408-866-2153 billh@cityofcampbell.com	**Akrista Aslin** West Valley Clean Water Program 408-354-5386 office 408-828-4658 cell aaslin@wvcwp.org **Bill Helms** (Susan Morgado-Gray) 408-866-2153 billh@cityofcampbell.com	**Akrista Aslin** West Valley Clean Water Program 408-354-5386 office 408-828-4658 cell aaslin@wvcwp.org **Lorenzo Perez** SCC FD, Haz Mat 408-378-4010 lorenzo.perez@cnt.sccgov.org **Michael Cervantes** Food Facilities – West Valley 408-918-3455 michael.cervantes@deh.sccgov.org
Cupertino	**Kevin Rieden** 408-777-3104 kevinr@cupertino.org **Cheri Donnelly** 408-777-3242 cherid@cupertino.org	**Manuel Barragan** 408-472-9907 **Cheri Donnelly** 408-777-3242 cherid@cupertino.org	**Larry Squarcia** 408-777-3228 larrys@cupertino.org **Cheri Donnelly** 408-777-3242 cherid@cupertino.org
Los Altos Hills	**John Chau** 650-941-7222 jchau@losaltoshills.ca.gov	**John Chau** 650-941-7222 jchau@losaltoshills.ca.gov	**Los Altos Hills does not have any industrial or commercial sites**

SCVURPPP Construction, Illegal Discharge, and Industrial Inspection Contacts

Agency	Construction Inspection	Illegal Discharge	Industrial Inspection
Los Altos	**Kirk Ballard** 650-947-2634 kirk.ballard@losaltosca.gov **Larry Lind** 650-947-2624 larry.lind@losaltos.ca.gov	**Larry Lind** 650-947-2624 larry.lind@losaltos.ca.gov	**Larry Lind** 650-947-2624 larry.lind@losaltos.ca.gov
Los Gatos	**Mike Machado** CBO 408-354-6815 mmachado@losgatosca.gov **Mark Glendinning** Building Inspector 408-354-6870 mglendinning@losgatosca.gov **Steve Souza** Engineering Inspector 408-395-3430 ssouza@losgatosca.gov	**Akrista Aslin** West Valley Clean Water Program 408-354-5386 office 408-828-4658 cell aaslin@wvcwp.org **Steve Souza** Engineering Inspector 408-395-3430 (M-F) ssouza@losgatosca.gov *Parks & Public Works General Line* 7am-4pm Mon thru Fri 408-399-5770	**Akrista Aslin** West Valley Clean Water Program 408-354-5386 office 408-828-4658 cell aaslin@wvcwp.org **Michael Benjamin** SCC FD, Haz Mat 408-378-4010 benjamin@cnt.sccgov.org **Michael Cervantes** Food Facilities – West Valley 408-918-3455 michael.cervantes@deh.sccgov.org
Milpitas	**Shelton Sawyer** 408-586-3407 ssawyer@ci.milpitas.ca.gov **Dorsey Wiseman** 408-586-3246 dwiseman@ci.milpitas.ca.gov.	**Paramjit Uppal** 408-586-3351 puppal@ci.milpitas.ca.gov	**Albert Zamora** 408-586-3371 azamora@ci.milpitas.ca.gov

SCVURPPP Construction, Illegal Discharge, and Industrial Inspection Contacts

Agency	Construction Inspection	Illegal Discharge	Industrial Inspection
Monte Sereno	**Mo Sharma** City Engineer & PW Director 408-354-7635 **Sindhi Mekala** Grading & Drainage Inspections; PW 408-354-7635 (Mon & We Only) sindhi@montesereno.org **Howard Bell** Building Official 408-354-2805	**Akrista Aslin** West Valley Clean Water Program 408-354-5386 office 408-828-4658 cell aaslin@wvcwp.org **Mo Sharma** City Engineer & PW Director 408-354-7635 **Sindhi Mekala** Grading & Drainage Inspections; PW 408-354-7635 (Mon & We Only) sindhi@montesereno.org	**City of Monte Sereno does not have any industrial or commercial sites**
Mountain View	**Eric Anderson** 650-903-6378 main 650-903-6225 direct eric.anderson@mountainview.gov **Carrie Sandahl** 650-903-6378 main 650-903-6224 direct carrie.sandahl@mountainview.gov	**Eric Anderson** 650-903-6378 main 650-903-6225 direct eric.anderson@mountainview.gov **Carrie Sandahl** 650-903-6378 main 650-903-6224 direct carrie.sandahl@mountainview.gov	**Eric Anderson** 650-903-6378 main 650-903-6225 direct eric.anderson@ci.mtnview.ca.us **Carrie Sandahl** 650-903-6378 main 650-903-6224 direct carrie.sandahl@mountainview.gov **Scott Heyworth** 650-903-6378 scott.heyworth@mountainview.gov
Palo Alto	**Chris Fujimoto** 650-329-2430 christopher.fujimoto@cityofpaloalto.org	**Chris Fujimoto** 650-329-2430 christopher.fujimoto@cityofpaloalto.org	**Chris Fujimoto** 650-329-2430 christopher.fujimoto@cityofpaloalto.org
San Jose	**Steven Osborn** 408-277-5635 steven.osborn@sanjoseca.gov	**Steven Osborn** 408-277-5635 steven.osborn@sanjoseca.gov	**Steven Osborn** 408-277-5635 steven.osborn@sanjoseca.gov

SCVURPPP Construction, Illegal Discharge, and Industrial Inspection Contacts

Agency	Construction Inspection	Illegal Discharge	Industrial Inspection
	Jared Hart 408-277-3595 jared.hart@sanjoseca.gov **Cathy Hoang-Mendoza** 408-277-3993 catherine.hoang-mendoza@sanjoseca.gov	**Cathy Hoang-Mendoza** 408-277-3993 catherine.hoang-mendoza@sanjoseca.gov **No Dumping Hotline** 408-945-3000 http://www.sanjoseca.gov/esd/stormwater/stormdrain-complaint.asp	**Mary Morse** 408-277-2767 mary.morse@sanjoseca.gov **Josef Denk (restaurants only)** 408-277-4818 joe.denk@sanjoseca.gov
Santa Clara	**Elliot Wier** 408-615-3092 ewier@ci.santa-clara.ca.us	**Elliot Wier** 408-615-3092 ewier@ci.santa-clara.ca.us	**Elliot Wier** 408-615-3092 ewier@ci.santa-clara.ca.us
Santa Clara County	**Clara Spaulding** 408-299-5737 clara.spaulding@pln.sccgov.org	**DEH/Solid/Medical Waste:** 408-918-3400 **Chris Rummel** 408-918-3400 chirs.rummel@deh.sccgov.org (refuse collection & pumper vehicles, biohaz & medical waste, body art & recycling facilities) **Clara Spaulding** Department of Planning & Developement 408-299-5737 clara.spaulding@pln.sccgov.org	**DEH, Hazardous Materials Control Division:** 408-918-3400 **Jim Blamey** HMCD Program Manager 408-918-3400 jim.blamey@deh.co.santa-clara.ca.us **Vicki Everly** Food Facilities – North County 408 918-3490 vicki.everly@deh.sccgov.org everly.vicki@deh.sccgov.org **Michael Cervantes** Food Facilities – South West 408-918-3455 michael.cervantes@deh.sccgov.org **Rochelle Gaddi** Food Facilities, Pools – Central District 408 918-3479 rochelle.gaddi@deh.sccgov.org

SCVURPPP Construction, Illegal Discharge, and Industrial Inspection Contacts

Agency	Construction Inspection	Illegal Discharge	Industrial Inspection
SCVWD	**Denise Uriarte** 408-265-2607, X2909 duriarte@valleywater.org **Pollution Hotline** 1-888-510-5151	**Denise Uriarte** 408-265-2607, X2909 duriarte@valleywater.org **Pollution Hotline** 1-888-510-5151	**Not Applicable**
Saratoga	**Brad Lind** 408-868-1224 bradlind@saratoga.ca.us **Skylar McLean** Grading / Land Development Inspections 408-868-1237 skyelarm@saratoga.ca.us	**Akrista Aslin** West Valley Clean Water Program 408-354-5386 office 408-828-4658 cell aaslin@wvcwp.org **Kristin Borel** 408-868-1258 kborel@saratoga.ca.us **Rick Torres** Streets Maintenance Supervisor 408-857-6545 cell rtorres@saratoga.ca.us	**Akrista Aslin** West Valley Clean Water Program 408-354-5386 office 408-828-4658 cell aaslin@wvcwp.org **Richard Baker** SCC FD, Haz Mat 408-378-4010 richard.baker@cnt.sccgov.org **Michael Cervantes** Food Facilities – West Valley 408-918-3455 michael.cervantes@deh.sccgov.org
Sunnyvale	**Gordon Blancher** 408-730-7448 gblancher@ci.sunnyvale.ca.us	**Sarah Scheidt** 408-730-7267 sscheidt@ci.sunnyvale.ca.us **Kristy McCumby Hyland** 408-730-7274 kmccumby@ci.sunnyvale.ca.us	**Sarah Scheidt** 408-730-7267 sscheidt@ci.sunnyvale.ca.us
Caltrans	**Dragomir Bogdanic** 510-622-0716 510-867-6007 dragomir_Bogdanic@dot.ca.gov	**Hardeep Takhar** 510-286-7182 hardeep_s_takhar@dot.ca.gov	**Not Applicable**

Santa Clara Valley
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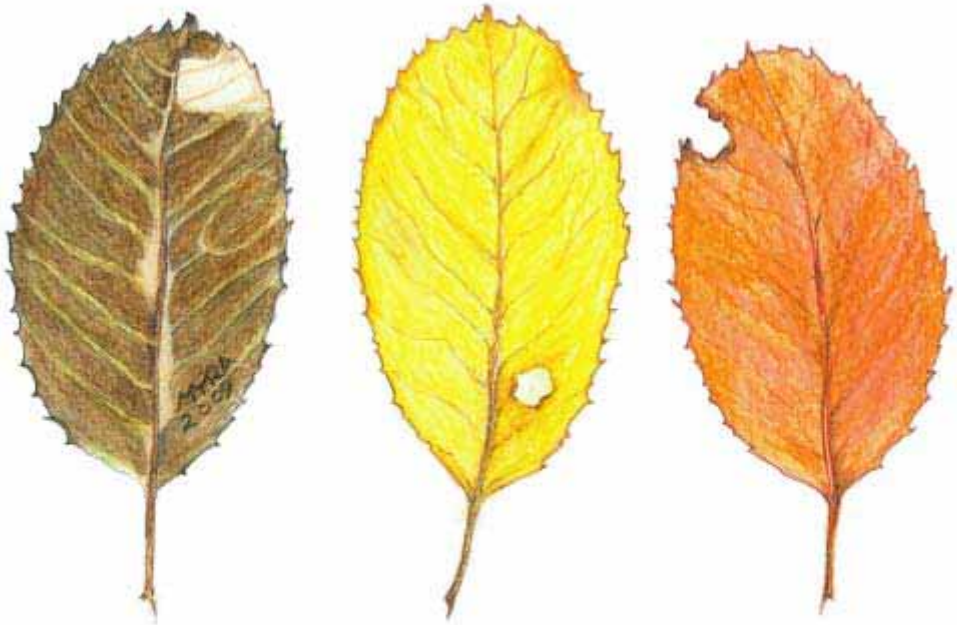
Appendix 7-5

Going Native Garden Tour 2010- Summary Report

September 15, 2010



Going Native
Garden Tour

GOING NATIVE GARDEN TOUR 2010
SUMMARY REPORT

June 30, 2010

Highlights

This report describes the GNGT committee's efforts during the past year (July 2009 through June 2010). The document also provides details about tour day, when hundreds of volunteers share their time, expertise and gardens to ensure that the thousands of tour visitors enjoy the day and receive inspiration for their own gardens. Table 1 lists some tour highlights.

Date	**April 18, 2010**
Time	**10am-4pm**
Number of gardens	**67**
Number of registrants	**4673**
Number of garden visits	**12447**
Number of volunteers	**262**
Volunteer-hours on tour day	**1163**
Number of Sponsors	**16**
Number of Supporters	**22**
Ongoing efforts to ensure a quality tour	• **Volunteer orientation meeting** • **Web-based volunteer signup** • **Enhanced web-based registration to cooperate with ISP anti-Spam filters.** • **Custom designed t-shirts for volunteers.** • **Plant labeling info on website** • **Invasive plants list on website** • **On-line survey, with a prize drawing to encourage participation.**
New initiatives	• **Native plant sales were expanded and featured nine nurseries at ten gardens.**

Table 1: Tour Highlights

The eighth annual Going Native Garden Tour took place on April 18, 2010 from 10AM to 4PM. The 4673 registrants who signed up for the tour made 12447 visits to the open gardens. There were 262 volunteers participating on tour day, serving as docents and greeters at the 67 open gardens.

Once again this year, various initiatives enhanced the tour experience for registrants and volunteers. Volunteers received a custom-designed organic cotton t-shirt. An on-line survey was conducted after the tour, and prize drawing offered to encourage people to input their comments. Our nine nursery sponsors conducted native plant sales at selected tour gardens. We received many positive comments about the tour and the plant sales.

New Presenting Organization

The Going Native Garden Tour Steering Committee is now a recognized part of the California Native Plant Society, Santa Clara Chapter.

California Native Plant Society, Santa Clara Chapter, a non-profit 501(c)(3), is the tour's fiscal agent. They provide insurance and administrative support for the tour, and their non-profit status makes donations to the tour tax deductible.

Sponsors and Supporters

This year's tour was sponsored by the following 16 organizations:
Acterra
Almaden Valley Nursery
Azureheart Structural Integration
Bay Area Water Supply & Conservation Agency
Bay Natives
Central Coast Wilds Nursery
East Bay Wilds
Friends of Master Gardeners of Santa Clara County
Gold Rush Nursery
Mediterranean Garden Society
Middlebrook Gardens
Native Revival Nursery
Santa Clara Valley Urban Runoff Pollution Prevention Program
Santa Clara Valley Water District
Watershed Watch
Yerba Buena Nursery
Sponsors paid for the following: garden signs, fliers, copying, orientation meeting and website expenses, and volunteer t-shirts.

The tour was supported by the following 22 organizations:
Bay Nature Magazine
California Native Plant Society, Santa Clara Valley Chapter
Capitol Wholesale Nursery
Conexions
Cory Neighborhood Association
Don Edwards San Francisco Bay National Wildlife Refuge
Expert Support, Inc.
Gardening With Natives
Guadalupe River Park and Gardens
Japantown Neighborhood Association
Larner Seeds
National Wildlife Federation
Neighborhood Development Center (City of San Jose)
Old Mountain View Neighborhood Association
Our City Forest
Rainbow West Neighborhood Association
Santa Clara Valley Audubon Society
Sierra Club (Loma Prieta Chapter)
Shasta/Hanchett Park neighborhood Association
Sunnyvale Garden Club

UCCE Master Gardeners
Western Horticultural Society
Supporters provided assistance in the following areas:
- Soliciting gardens and volunteers
- Publicizing the tour to their members
- Linking their website to the tour website
- Distributing tour fliers at events

Sponsor and supporter information was publicized through tour literature, fliers, and press releases. The garden signs featured logos and graphics of sponsors and supporters, as shown in Figure 1.

Figure 1: Garden sign graphic

In addition to the listed sponsors and supporters, four designers volunteered to contribute their time in one-hour consultations, serving as the grand prizes for the on-line survey drawing: Fran Adams(*Sense of Place*), Stephanie Curtis(*Curtis Horticulture*), Agi Kehoe(*Agnes Kehoe Landscaping*), and Deva Luna(*EarthCare Landscaping*). The steering committee appreciated their contribution

Steering Committee

Table 2 lists the steering committee members and their roles.

Role	**Core Member**	**Additional Contributors**
Garden Selection/Descriptions/-Directions	Renate Kempf, Madeline Morrow , Diana Stanley, Ginny Veach	Peigi Duvall, Agi Kehoe, Deva Luna
Website	Krzysztof Kozminski, Diana Stanley, Bob Weissman,	Jan Clayton
Volunteer Coordination	Nella Henninger	
Garden Previews	Ingrid Graeve	Rhonda Kutche
Publicity	Kay Gutknecht, Arvind Kumar	
Sponsor Liaison/Development	Arvind Kumar	Ginny Veach
Fiscal Agent	CNPS: Julie Scherer, treasurer	
Visitor Materials (maps, descriptions, etc.)	Krzysztof Kozminski	
Coordination	Ginny Veach	

Table 2: Steering Committee members

The steering committee itself logged more than 800 volunteer-hours during the past year. The *Don Edwards San Francisco Bay National Wildlife Refuge* at the Environmental Education Center in Alviso (San Jose) provided meeting space. Some meetings occurred at committee members' homes. The committee met on the first Sunday of each month (varied as necessary).

Volunteers

This year the tour drew a total of 262 volunteers who logged 1163 volunteer-hours working at gardens on tour day. Some volunteers worked as docents who were knowledgeable about native plants and conducted guided tours of gardens. Others worked as greeters who welcomed visitors, encouraged them to sign the guest book, and answered general questions. In addition to contributing their time on tour day, garden owners worked hard readying their gardens for the tour.

The tour has been designated a project by UCCE Master Gardeners of Santa Clara County so that volunteer hours for the tour would count toward the Master Gardener volunteer service requirement. As a result, eighty-one of the tour day volunteers were Master Gardeners.

Funding

Our sponsors supplied both monetary donations and donations of signage and flyer production.
The primary tour expense is production of volunteer t-shirts. Minor expenses included supplies for the Orientation Meeting and the fiscal agent fee.

Garden Selection

This year's tour featured 67 gardens. Of these, 26 gardens (39%) were on the tour for the first time. This year, 9 public native gardens and 3 school gardens were included in the tour. Most of the gardens were located in Santa Clara County, and a few gardens were in southern San Mateo County. The southernmost garden was in Morgan Hill. The Garden Selection Committee evaluated a total of 78 submitted gardens and prepared garden descriptions and plant listings for the gardens selected.

Figures 2 and 3 depict area maps showing the approximate locations of gardens selected for the 2010 tour.

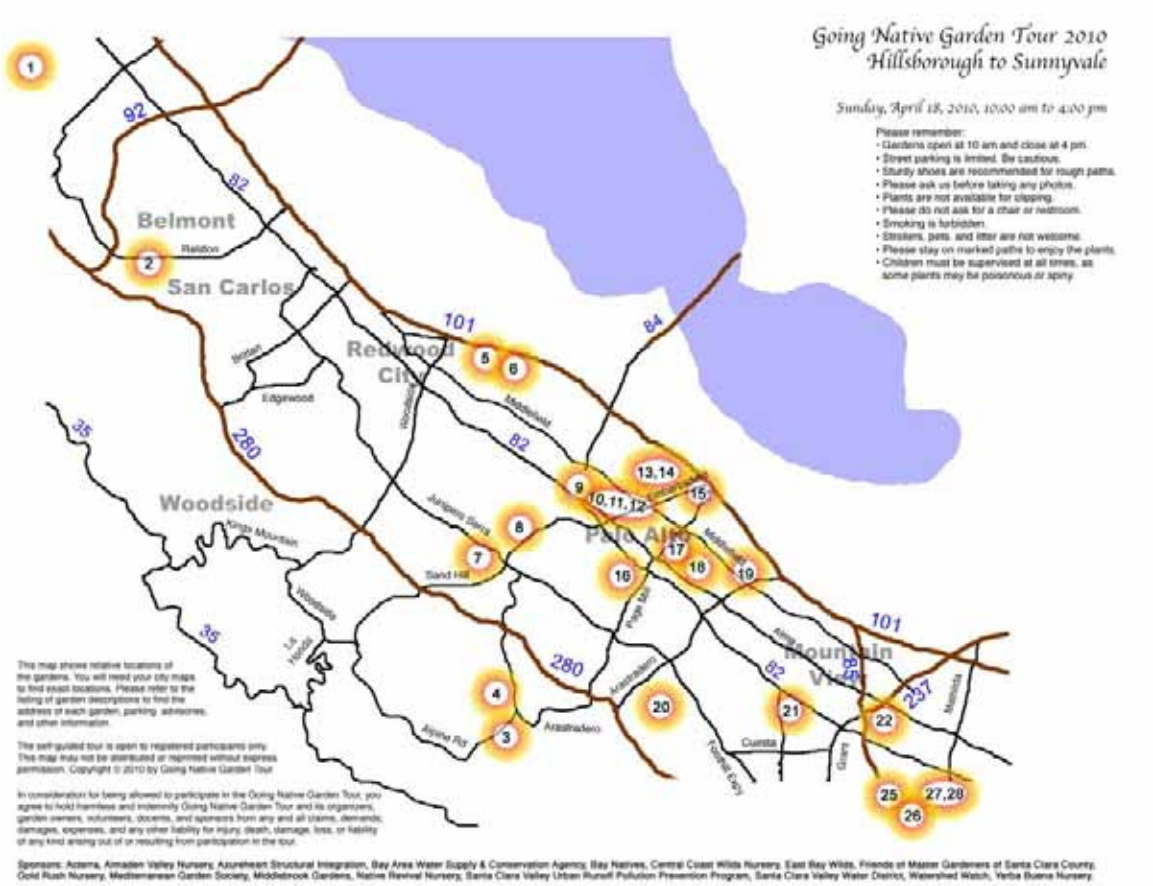


Figure 2: Gardens in the northwestern part of the tour area

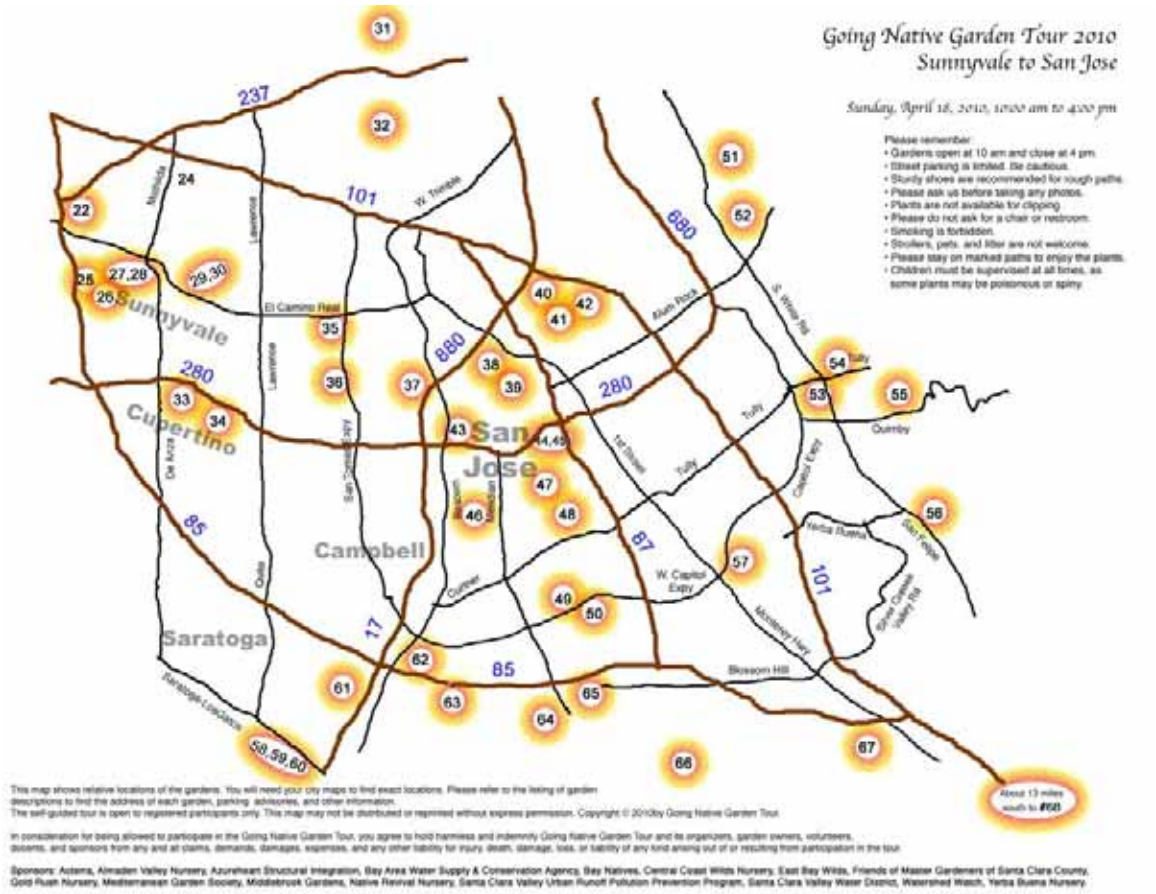


Figure 3: Gardens in the southeastern part of the tour area

Garden Previews

As a way to attract and retain volunteers, the tour committee offers a Garden Preview program for volunteers (inspired by the Garden Soirees organized by the East Bay Bringing Back the Natives Tour). Under this program, volunteers receive invitations to visit private native gardens throughout the year. This is a reward for their volunteer efforts, and a chance to see gardens they otherwise miss due to their volunteer duties on tour day. Many appreciate the opportunity to see native gardens at different times of the year. Under this program, a total of 7 garden previews were arranged between July 2009 and June 2010, attracting from 6 to 20 volunteers to any one garden visit.

Other Volunteer Benefits

This year all volunteers received custom designed t-shirts. Myra Saylor designed the T-shirt art. She is an artist on paper, canvas and gourds and lives part time in Yuma, AZ and part time in California. She is a Master Gardener in Arizona and a great proponent of native landscaping. Her design for this year's shirt, featuring toyon leaves, is on the front page of this report. GNGT sponsor Azureheart supplied additional funds to enable the purchase of organic cotton shirts.

Tour Orientation

Tour organizers once again offered a well-received volunteer orientation program two weeks before tour day. All volunteers and garden hosts were invited to attend an evening meeting; a short presentation covered greeter, docent, and garden owner tasks and benefits followed by a question and answer session. Tour materials and signs were distributed and refreshments were served. The meeting also provided the opportunity for attendees to talk with members of the steering committee and meet other like-minded volunteers.

Publicity

The publicity this year targeted print media, gardening and environmental groups, colleges/academics, broadcast media, city business bureaus, water companies, nurseries, special interest groups and neighborhood associations

Hard copy press releases were mailed to selected media outlets. Five thousand color fliers were distributed to libraries, nurseries, Water District, CNPS meetings, Master Gardener meetings, and other locations. This year, the majority of the fliers were mailed to these locations.

The tour received coverage in the following publications:

Western Horticulture
Yerba Buena Nursery newsletter
Gilroy Dispatch
Santa Clara County Master Gardener newsletter
Avocet (Santa Clara County Audubon newsletter)
CNPS Yerba Buena chapter newsletter
Pacific Horticulture
Palo Alto Weekly
San Jose Mercury News
San Francisco Chronicle

Registrants identified many varied sources for learning about the GNGT. Registrants who completed the on-line survey indicated that most obtained information from the San Jose Mercury News and via email. Now entering its ninth year, the tour has established a loyal base of adherents, and a reputation and following among the gardening public.

Website

The tour website is located at www.goingnativegardentour.org and features a number of significant enhancements. This same site can be accessed using www.gngt.org.

The garden submission form is online. All gardens featured this year came through this automated form, which is live 365 days of the year. The registration system is also online.

Jan Clayton from Expert Support came up with a new design for the Garden Tour landing pages. The design has a modern look and feel, condenses the information, and makes it easier to find the information. The design was implemented just in time for the main sign-up time (last month before the tour). Jan has volunteered to help with the design of the rest of the website so we can have a consistent, easy to use, and informative web site for all our users year round.

The number of web pages increased with the addition of information about this year's gardens. The showcase feature of each garden is described along with other garden attractions, wildlife value, years gardening at this location, and lot size. Up to four pictures from each garden allows website visitors to see the actual garden. Where available, plant lists are provided online. Garden addresses are not given. These web pages, along with pages from previous years' tours, are available year-round, serving as a valuable resource for people searching for great native garden ideas.

Descriptions for making various styles of labels are on the website, as an aid for the garden owner. Clear labeling helps answer many of the garden visitors questions, so that docents have more time to discuss other aspects of the garden with visitors.

With the permission of Cal-IPC, a summary list of plants considered invasive in California natural areas was extracted from their documents (California Invasive Plant Inventory, Feb. '06, and Cal-IPC News Spring 2007). This list is available on the GNGT website. A link to their full database allows interested browsers to access more details about these invasive plants. Note that this list focuses on plants that imperil natural areas – there are other cultivated plants that can be quite invasive in the home garden.

Volunteer signups are now automated on the website, with information going directly to a database that allows for easier coordination on tour day.

A new "GNGT store" link on the website provides a shopping opportunity! This year's custom t-shirt design is available on various products –sweatshirts, mugs, bags – with some of the proceeds benefiting the Going Native Garden Tour.

2010 Registration

Table 3 shows that San Jose supplied 1233 (26% of the total) registrants, followed by Palo Alto, Sunnyvale, Los Altos, Mountain View and Redwood City.
Santa Clara County supplied 3316 registrations (71% of the total), and San Mateo County supplied 888 registrations (19% of the total).

City	Total
San Jose	1233
Palo Alto	409
Sunnyvale	317
Los Altos	283
Mountain View	233
Redwood City	174
Menlo Park	157
Los Gatos	156
Santa Clara	154
Cupertino	144
San Mateo	115
Campbell	113
Saratoga	112
Portola Valley	110
Burlingame	92
San Carlos	77
Morgan Hill	71
San Francisco	51
Fremont	50
Gilroy	44
Oakland	38
Milpitas	32
Belmont	31
Santa Cruz	30
Pacifica	29
Watsonville	20

Table 3: Number of registrants by city

Tour Materials

Links to web-based tour materials were emailed to all registrants two weeks before the tour. These materials were designed to allow tour visitors to plan out their route and which gardens to visit. The tour materials consisted of:

Garden addresses and detailed descriptions and directions
Area maps showing the approximate locations of gardens

Each garden received the following materials:
Guest book for visitor sign-in
Tour Garden Sign (durable, weather-proof, and should last for a long time) and 2 stakes
Garden Etiquette (description of procedures on tour day)
Small sign requesting donations

Gardens received brochures and literature to distribute, and some gardens provided plant lists and garden write-ups.

Tour Day

Tour day weather was warm and sunny. The tour traffic was reasonably well distributed. In general, the southeastern locations received fewer visitors than the gardens that are further up the peninsula. A total of 12447 visits were logged, which is an underestimate as not every visitor signs the guest book. Also, most public gardens did not return a visitor count, so total number of visits during the tour actually exceeded the number quoted above. A garden in Palo Alto logged the tour record: 665 visitors.

Chart 2 shows the attendance at the gardens on this year's tour, arranged in order by garden number. Lower garden numbers tend to be located to the northwest (Belmont, Redwood City), and higher garden numbers southeast (Evergreen area in San Jose). Garden #1 is in Hillsborough and Garden #68 is in Morgan Hill.

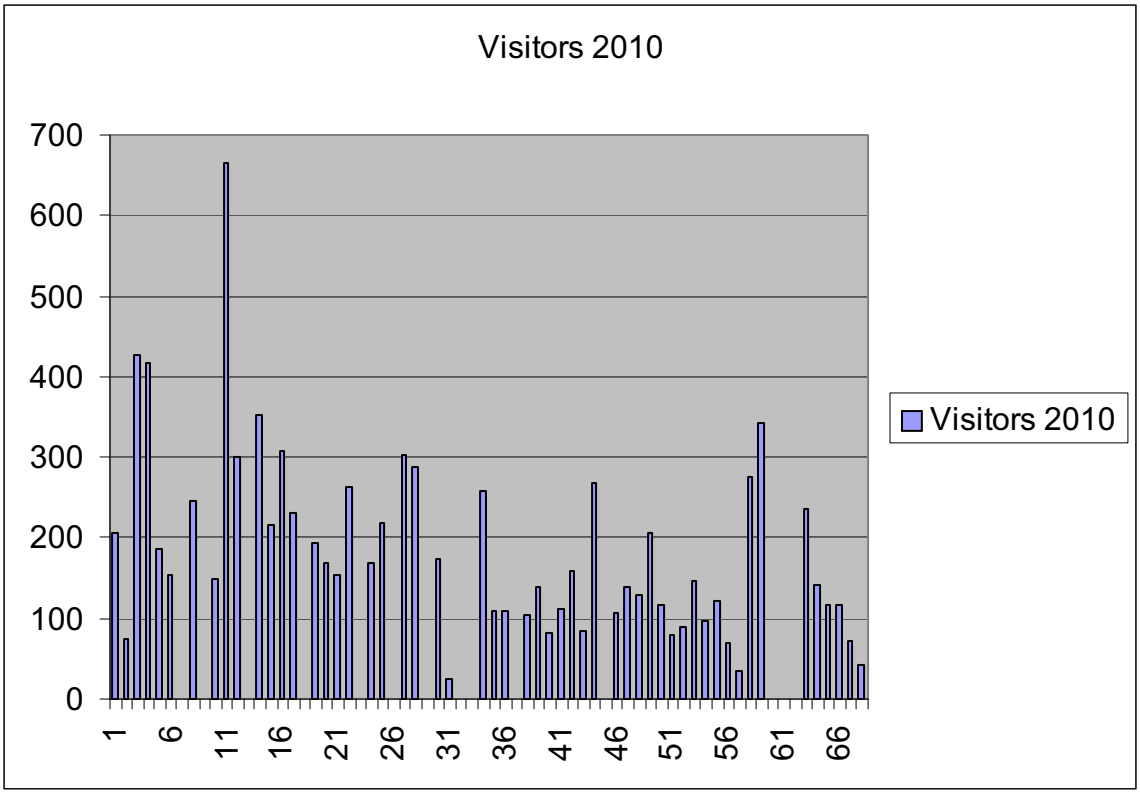


Chart 2: number of visitors by garden number

Visitor Feedback – Guest Books

Here are a few of the comments entered in the guest books by visitors. It's not surprising few comments are written in the guest books, as the visitors are rushing to see gardens in the time allowed.

Garden	Comments
5	This has got to be the best organized garden we've seen in 4 or 5 years of taking this tour. I enjoyed your sense of humor in the rock sculpture garden. To me, the back yard captures the sense of being in the mountains. It must be a peaceful place to sit. Thanks.
10	Nice to see a native garden at something other than a private home.
16	The meadow in back was beautiful. Thank you for sharing.
30	Your garden has evolved into a wonderful place. Do you rent out the hammock by the day?
45	Love show of small space usage, combination edibles, natives, continuation of neighbor's native garden. Could use more plant signs/labels.
50	Very educated tour. We got more information here than other places. Our student tour guide was really good.
51	First stop – don't have to see more! Can I take it all home?
65	Great job. Good alternative to a front lawn.

Visitor Feedback – On-Line Survey

For the third time, the GNGT conducted an on-line survey, patterned after the *Bringing Back the Natives Garden Tour* organized by Kathy Kramer. A random drawing was offered for participation in the survey, with t-shirts and four 1-hour design consultations offered as 'grand' prizes. More than 600 people submitted the survey, rating various aspects of the tour and supplying many detailed comments. About half of the respondents had attended a previous GNGT, and party size was mostly one or two people. Here are some of the ratings and feedback supplied by survey participants:
Overall rating of tour: 68% Excellent, 30% Good
Familiarity with native plant gardening: 34% beginner, 58% some knowledge

Garden Comments
Most respondents supplied detailed and frank comments regarding the gardens they toured – for example:

Garden #3: Fantastic, owner gave us printed layouts of the garden and was so friendly and helpful and her sons had hot coffee or lemonade for sale which was most appreciated as we were there at 10:00 a.m wanting to also purchase plants from Acterra.
Garden #11: Charming vignettes and intimate seating areas in front. In rear, the combination of design areas, existing landscaping, mature trees and native themes weaves a harmonious and welcoming whole.
Garden #18: The courtyard was the most successful part of this newly planted garden. The back yard was not filled in much yet, but we noticed that even when filled in, there was not much variety in the height of plants to break the intense heat of the afternoon sun.
Garden #32: Wonderful park, great examples of full size shrubs and small trees that would have needed to be cut back in a garden setting. looks like it's size makes it hard to keep free of weeds
Garden #59: Beautiful combination of plants and art; I especially loved the waterfall mural and the dry creekbed. Nice combination of natives and nonnatives; a very controlled garden.
Garden #66: Good collection, but random placement of material. No sense of direction of design.

Suggestions for Improvement
Respondents supplied more than 372 suggestions for improving the tour, which the Steering Committee will review while preparing for next years tour – for example:

We visited about 6 gardens in our neighborhood. The map was a little difficult to navigate - it would help if you could enlarge it more. Everyone was very gracious and it inspired us to get after it in our own yard.

On the description of plants that are included in the gardens, having a link (or a picture) of the plant with its size when mature, color, purpose (good for bees, butterflies...) etc. can help identify them quickly.

Include the numbers of the sites on the list with links, so that gardens can be easily cross referenced to map and other material. the maps and Google links were great.

It was all very wonderful! I had problems figuring out which gardens to go to. I was only able to go to 10 in the 6 hours since I'm new to this and asked a lot of questions. Maybe having the tour on 2 separate days, split by the Northern cities, then the Southern the next day or weekend.

Identify gardens that are open to public so that one can choose the ones that are private and see the ones open to public later.

It would be nice to have the list of gardens earlier.
Also - more info on deer resistant plants.

Table 4 lists 14 garden management practices and survey respondents' strategy regarding them. Note that most have already reduced insecticide and herbicide use, and many plan to increase planting density, reduce lawn size, group plants with similar water needs, and encourage birds and butterflies.

Will tour influence you to do this?	already doing this	I began doing after Tour	I plan to do this	I have no plans to do this	Response Count
1. Mulch with wood chips, leaves, etc.	69.0% (372)	1.9% (10)	24.1% (130)	5.0% (27)	539
2. Increase planting density to out-compete weeds.	33.3% (164)	3.7% (18)	45.3% (223)	17.7% (87)	492
3. Encourage birds, butterflies, etc. with plant choices, food, shelter, and water.	55.7% (298)	3.4% (18)	34.6% (185)	6.4% (34)	535
4. Tolerate some insect damage to plants.	72.0% (368)	4.7% (24)	18.2% (93)	5.1% (26)	511
5. Reduce/eliminate insecticide/herbicide use.	76.6% (402)	4.0% (21)	17.0% (89)	2.5% (13)	525
6. Include water-wise plants in the garden.	63.5% (346)	4.6% (25)	31.0% (169)	0.9% (5)	545
7. Include native plants in the garden.	57.7% (318)	7.4% (41)	33.9% (187)	0.9% (5)	551
8. Group plants of similar water needs.	52.1% (267)	5.7% (29)	39.1% (200)	3.1% (16)	512
9. Install efficient irrigation (e.g., drip, timers, soaker hoses).	57.0% (297)	2.7% (14)	28.4% (148)	11.9% (62)	521
10. Reduce the size of the lawn.	49.7% (257)	1.4% (7)	38.7% (200)	10.3% (53)	517
11. Leave grass clippings on the lawn.	45.5% (197)	2.1% (9)	12.5% (54)	40.0% (173)	433
12. Compost yard waste and kitchen scraps.	62.7% (328)	1.3% (7)	18.2% (95)	17.8% (93)	523
13. Amend soil with compost.	73.0% (382)	2.3% (12)	17.2% (90)	7.5% (39)	523
14. Minimize hardscape (patios, decks).	37.0% (183)	1.4% (7)	20.2% (100)	41.3% (204)	494

Table 4: On-line survey results regarding garden management practices.

Host Gardener Feedback

Here is a sample of host gardener feedback:

Lots of inspired people, lots of people planning to convert their lawns into native gardens. Many thanks to our greeters Sandy and Jan who were helping with everything what was needed, even with our young children.

We had 90 people visit our garden. The experience was wonderful and the day could not have been more beautiful!

We had 231 visitors, including 4 neighbors who had not signed up in advance. I'm not sure we got absolutely everybody to sign in. A lot of people arrived at the same time to attend the talks.

We had lots of intelligent questions and very positive comments about the yard.

The weather was great and the visitors very interested in the use of water and how plants can grow in the shade.

Future Plans

Steering Committee volunteers are tackling the task to automatically build garden web pages by using information supplied by garden owners and stored in a common database. They are also trying to develop a cross-reference system to supply website links to various gardens based on topics of interest. For example, a website visitor could find and browse all gardens that have rain capture/containment features, or all gardens with meadows.

Summary

Table 5 compares some key statistics for the last four tours.

Year of Tour	**2006**	**2007**	**2008**	**2009**	**2010**
Number of gardens	46	45	42	53	67
Number of registrants	3,656	3,120	3523	5090	4673
Number of garden visits	7,606	6,688	7,137	12,824	12447
Number of volunteers	147	200	220	265	262
Volunteer hours on tour day	660	690	741	800	1163

Table 5: Tour statistics, 2006 through 2010

This year's Going Native Garden Tour featured 26% more gardens than last year. There were 8% fewer registrants and 3% fewer garden visits.

The tour received grants that enabled the purchase of organic t-shirts for the volunteers. There was a slightly different mix of sponsors and supporters this year, with more nursery sponsors and more neighborhood association supporters.

The on-line survey was used for the third time this year and supplied lots of informative feedback and some great suggestions. The steering committee will find this very helpful for future planning.

The continued success of the Going Native Garden Tour demonstrates that our community has a sustained interest in growing California native plants in home gardens and in environmentally conscious gardening practices.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 7-6

Watershed Watchers: Keeping Out Waterways Clean: FY 09-10 Fourth Quarter Report including end-of-year Summary from Alviso

September 15, 2010

WATERSHED WATCHERS:
Keeping Our Waterways Clean

FY09-10
4th Quarter Report
April - June 2010

Intern Jennifer Nielsen cheerfully poses with the Blue Goose at South Bay Bird Fest on May 1st, 2010.

Prepared for:
Santa Clara Valley Urban Runoff Pollution Prevention Program
San Francisco Bay Wildlife Society
Don Edwards San Francisco Bay National Wildlife Refuge

A. Program Title and General Focus:

This partnership program between the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP), the U.S. Fish and Wildlife Service's Don Edwards San Francisco Bay National Wildlife Refuge Environmental Education Center (EEC), and the San Francisco Bay Wildlife Society (SFBWS) provides services and programming that interpret the message of the Watershed Watchers program. The purpose of the Watershed Watchers program is to increase the surrounding communities' knowledge of urban runoff pollution and how to reduce its harmful effects through personal behavior changes.

B. Program Team:

•Debra King has been the Interpretive Specialist and Watershed Watchers Program Coordinator as of March 2009. Debra studied at the University of California, Berkeley, and graduated with a B.S. in Environmental Sciences and a Minor in Music. After finishing college, Debra worked at the East Bay Humane Society Hospital and taught at various non-profit education organizations (including Giraffe Learning Center and World Culture and Education Organization). She also worked in the Education Department at the San Francisco Zoo, coordinating volunteers, working with animals, and developing interpretive programs, before she landed at the EEC in Alviso in September as the Slow the Flow Intern.

•Genie Moore is the Environmental Education Center Director. She brings her experiences of coordinating the "Wetland Round-Up" and "Trekking the Refuge" field trip programs, and the Common Murre Restoration Project for the Visitor Center in Fremont.

•Renee' Maningding is the Watershed Watchers Intern for the San Francisco Bay Wildlife Society. She graduated from the University of California, Santa Cruz, with a B. A. in Environmental Studies and Anthropology. Renee' is also actively involved with her Filipino folkdance group, and has volunteered with Happy Hollow Park and Zoo.

•San Francisco Bay Wildlife Society, established in 1987, is a non-profit cooperating association that has supported education, interpretation and other public use programs at the Don Edwards San Francisco Bay National Wildlife Refuge. The San Francisco Bay Wildlife Society administers the Watershed Watchers Program.

•Volunteers are vital and are often very involved with the Watershed Watchers Program by assisting with interpretive programs, field trips, and special events.

C. Highlights

Earth Day Community Service

This quarter's Earth Day Community Service was composed of a small but very energetic group of volunteers. We first discussed the importance of wildlife refuges and conservation. We then talked about invasive species and the significance of removing invasive species and planting native ones. The participants were all hard working, lively, and cleared a huge amount of mustard in our restoration area. We then went on a short hike to discuss the different habitats here at the Don Edwards San Francisco Bay National Wildlife Refuge, and learned about how urban runoff pollution not only affects wildlife, but also people.

Our awesome Earth Day Community Service group poses in front of the Pavilion on April 18th, 2010.

A volunteer: hard at work removing mustard.

Scout Programs

Scouts have been consistently enthusiastic about our Watershed Watchers programs. In addition to satisfying badge requirements, scouts enjoy learning all about the habitats here at the Environmental Education Center while practicing their binocular skills. They make their own wetland bird guides, pinecone bird feeders, and write journals about the wildlife they observe. The word is definitely out, and each quarter we field more and more calls about people wanting to participate in our scout programs.

Scouts brave the cold and rain during one of our Junior Girl Scout Wildlife Badge programs in May.

South Bay Bird Fest

Another year, another great event! For this year's South Bay Bird Fest, we partnered with the Santa Clara Valley Audubon Society, Wildlife Center of Silicon Valley, Los Gatos Birdwatcher, and, of course, the San Francisco Bay Wildlife Society. The Wildlife Society donated funds to keep our volunteers well fed, happy and energized, and the Los Gatos Birdwatcher donated program supplies and raffle prizes. As in previous years, the SCV Audubon Society brought out their "bird popsicles" and helped participants make their very own binoculars. We were also very excited to have the Wildlife Center of Silicon Valley bring out two of their education birds – a Red-shouldered hawk and an albino American crow.

Participants loved all the games, hikes, live birds, the puppet show, our new magic show, as well as all the other fun activities going on at the Environmental Education Center, and by the end of the day, we had 330 smiling faces walk through our doors.

D. Fouth Quarter Summary (April-June)

Total Number of Programs Summary

Program Type	# of Programs Proposed	# of Programs Offered	# of Programs Conducted	Proposal Met?
Public Programs	7	13	12	Exceeded
Group Programs	5	8	8	Exceeded
Stewardship Programs	2	3	2	Met
Outreach Programs	1	6	6	Exceeded
Summer Camp	n/a	n/a	n/a	Met
Special Events	1	1	1	Met
TOTAL	16	31	29	

Total Number of Participants Summary

Program Type	Pre K	Elem	Middle	High	Adult	Total #
Public Programs		111		1	146	258
Group Programs		101	7		69	177
Stewardship Programs		17			11	28
Outreach Programs	23	217		4	88	332
Summer Camp						n/a
Special Events						330
TOTAL	23	446	7	5	314	1125

E. Program Details:

Public Program – Wildlife in Our Watershed Depends on You
A series of guided nature walk, hands-on science, and/or nature activities that focus on how individual behaviors cause or prevent urban runoff pollution and affect wildlife habitat in the watershed. (See Appendix A for programs offered this quarter)

Goal – 7 programs

Date	Programs	Pre K	Elem	Middle	High	Adult	Total # of Attendee
4/3/10	Beginning Bird Photography		4			8	12
4/10/10	Monster Bacteria		10			19	29
4/11/10	Drawbridge					4	4
4/24/10	All About Owls		14			15	29
4/24/10	Habitat Exploration		11			13	24
5/8/10	Beginning Bird Photography		14				14
5/9/10	Beginning Bird Watching		7			7	14
5/15/10	Bike the Levees				1	4	5
5/21/10	Night Sky Party!		38			36	74
5/22/10	Advanced Bird Photography						vol. cancel
6/19/10	Wetland Safari		6			14	20
6/19/10	Salt Marsh Life…Food Chain		6			10	16
6/26/10	Advanced Bird Photography		1			16	17
Offered: Conducted:	13 12		111		1	146	258

Proposal: ___Met ___Not Met _X_Exceeded

Many programs wouldn't be possible without the help of our wonderful interns and amazing volunteers.

Group Programs – Our Role in Preventing Urban Runoff Pollution
Presentation and walk focusing on each individual's role in preventing urban runoff pollution, including examples of alternative behaviors. (See Appendix A for program descriptions)

Goal – 5 programs

Date	Programs	Pre K	Elem	Middle	High	Adult	Total # of Attendee
4/3/10	Brownie Eco-Explorer Patch		12			10	22
4/23/10	Private Brownie Scouts		12			6	18
5/4/10	Private Monster Bacteria		6	7		6	19
5/15/10	Lyceum Mysteries…Marsh		5			4	9
5/22/10	Webelos Naturalist Badge		20			14	34
5/25/10	Private Girl Scouts		10			4	14
6/5/10	Private Wolf Scouts		18			15	33
6/5/10	Private Brownie Scouts		18			10	28
Offered: Conducted:	8 8		101	7		69	177

Proposal: ___Met ___Not Met _X_Exceeded

Stewardship Programs – Gardening Without Chemicals
Workshops and garden workdays are both included in this category. Workshops highlight California native plans, emphasizing their benefits to native animals and demonstrate how to garden without chemicals. The workshops focus on how chemicals entering the watershed compromise the integrity of our waterways and are harmful to wildlife. Garden workdays illustrate chemical-free gardening techniques. (See Appendix A for specific program details)

Stewardship – Gardening Without Chemicals
Goal – 2 programs

Date	Programs	Pre K	Elem	Middle	High	Adult	Total # of Attendee
4/17/10	Community Service		4			4	8
5/8/10	Community Service						cancelled
5/14/10	Scout Community Service		13			7	20
Offered: Conducted:	3 2		17			11	28

Proposal: _X_Met ___Not Met ___Exceeded

Outreach Programs
Take information about the program to offsite events in order to attract new participants to weekend programs and special events.

Outreach
Goal – 1 program

Date	Programs	Pre K	Elem	Middle	High	Adult	Total # of Attendee
4/8/10	Alum Rock Library		22			15	37
4/10/10	Willow Glen Library	6	19			13	38
5/19/10	Santa Teresa Library	10	25			19	54
5/26/10	GRPG Water Wizards		97			20	117
5/28/10	Evergreen Library	7	29		4	18	58
3/19/10	Wisdom Education Org.		25			3	28
Offered: Conducted:	6 6	23	217		4	88	332

Proposal: ___Met ___Not Met _X_Exceeded

Summer Camp
Marsh-In Summer Camp is offered for elementary school-age children, for one week in August. Participate as a camp coordinator and activity leader. Assist in program development, implementation, execution, and cleanup.

Summer Camp
Goal – n/a

Proposal: _X_Met ___Not Met ___Exceeded

Special Events
Special events are offered twice a year and are designed to attract at least 200 people to the EEC for various activities educating participants about urban runoff pollution prevention.

Special Events
Goal – 1

Date	Programs	Pre K	Elem	Middle	High	Adult	Total # of Attendee
5/1/10	South Bay Bird Fest!						330*
Offered: Conducted:	1 1						330

*specific ages were not recorded

Proposal: _X_Met ___Not Met ___Exceeded

F. Public Outreach – The Audience and How it was Reached

This project involves public outreach encompassing a wide variety of groups and individuals in Santa Clara County. The audience varies in age, ethnicity, interest, occupations, and income levels. The following programs offer an opportunity for public outreach:

•The Environmental Education Center in Alviso offers trails and access to wildlife viewing for the public to gain first-hand knowledge of the value of our Bay habitats. Visitors who tour the Environmental Education Center have an opportunity to use the storm drain model, speak with the interpretive specialist about the salt marsh, have access to "things to see," as well as learn about current threats to wildlife of the salt marsh. The "audience" is as diverse as the population in the Bay Area, including people from varied ethnic backgrounds and socioeconomic status.

•The Watershed Watchers programs are primarily held on the weekend at the Environmental Education Center. *Bay Area Parent* continues to send numerous new visitors to the EEC. Santa Clara County residents attending these weekend programs are given informational flyers produced by SCVURPPP, including "Grow-It" and "You are the Solution to Water Pollution". The program is continually trying to reach new and different audiences, and goals for the next quarter involve doing programs at more libraries in Santa Clara County, and reaching out to more high school students.

G. Outreach Materials Produced

Quarterly fliers for weekend programs are attached. These materials are distributed at outreach opportunities and they are distributed as noted below:

H. Making the Project Known to the Community at Large

Programs are advertised in the following media:

Tideline (the Refuge newsletter with over 17,000 subscribers)
Don Edwards San Francisco Bay National Wildlife Refuge website
Bay Area Parent publication
Flyers (located at the Refuge, schools, and South Bay libraries, Central YMCA, Learning Rainbow Teacher Supply Store, Hicklebee's Children's Bookstore)
Lyceum publication and website
Bay Nature Magazine
Bay Area Publications
Active Days website
Los Gatos Birdwatcher
Santa Clara Valley Unified School District Middle and High Schools
San Jose Unified School District Middle and High Schools
Tri-City Voice

I. Coordinating Refuge Volunteers

Contact volunteers to lead programs, training, and maintaining relationships with volunteers. Schedule volunteers to work on special events. Volunteers are instrumental in providing programs at the EEC.

J. Project Feedback

How the project has changed specific behaviors which adversely affect water quality and increase the understanding and appreciation of streams and the Bay.

Participants in the Watershed Watchers programs provided feedback as to how the program has increased their awareness of urban runoff pollution. The following statements are actual written comments taken from surveys and represent behavioral changes survey respondents are willing to make to minimize storm drain pollution:

- save garbage for trash bins
- don't pour chemicals (paint, soap, motor oil) down storm drains
- don't litter/ dispose of trash properly
- pick up dog poo
- use environmentally-friendly soap and chemicals
- will save water, use less during showers
- will improve my habits

The following are general comments that visitors made about the Refuge and programs:

- projector needs to be fixed
- excellent
- fantastic!
- This is a wonderful resource - thank you!
- We wanted to walk further!

K. Visitor Survey

A Visitor Survey is used to determine visitor demographics, effectiveness of publicity, and effectiveness of the Watershed Watchers programs. Each survey represents an entire family, typically composed of 2 adults and 2 children. The current quarter survey results are summarized below for the Watershed Watchers: Keeping Our Waterways Clean program (Survey is attached in appendix).

Number of Surveys Completed in the 4th Quarter = 91
59% were first time visitors
27% were repeat visitors

Visitors rate programs on a scale of 1 to 5, 5 being highest

1% rated programs 1-3
11% rated programs 4
54% rated programs 5

After visiting the EEC, 80% of the visitors knew that storm water flows into storm drains and then directly to creeks and the bay. As a result of their visit, 79% listed a behavioral change they are willing to make to keep their storm drains clean.

83% of visitors learned about urban runoff
80% of visitors learned about preserving and protecting South Bay habitats
69% of visitors learned something about watersheds

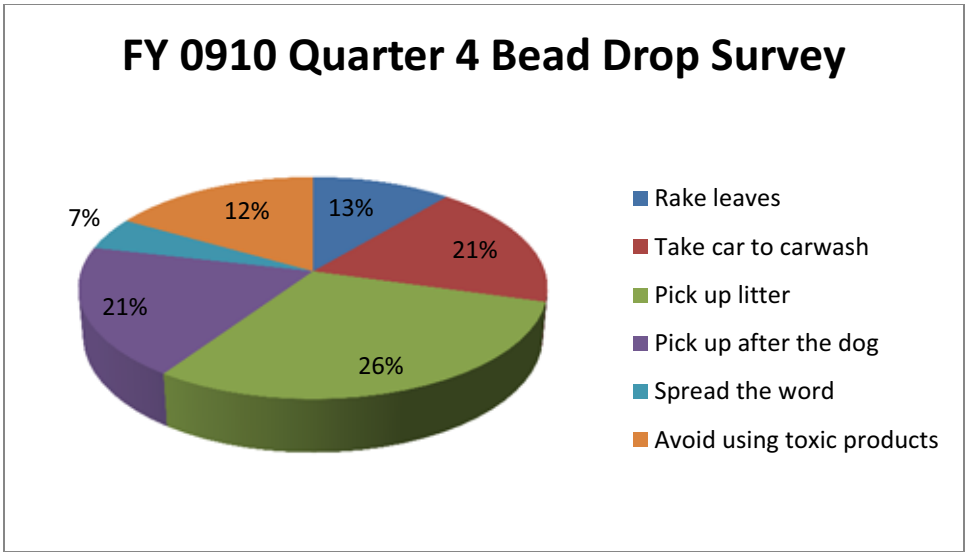
Visitor Demographics

Alviso	Campbell	Cupertino	Gilroy	Fremont	Los Altos	Los Gatos	Milpitas
1%	1%	9%	0%	4%	1%	1%	10%

Mtn. View	Morgan Hill	Santa Clara	San Jose	Saratoga	Sunnyvale	Other
1%	0%	21%	30%	0%	2%	17%

Bead Drop Display

The Urban Runoff Bead Drop Display records things children promise to do to help keep storm drains clean.



L. Grant Year in Review

July 1, 2009 – June 30, 2010

Program Numbers

Program	# Proposed	# Conducted	# of Participants
Wildlife in Our Watershed	25	40	673
Our Role in Preventing Urban Runoff Pollution	21	33	827
Gardening Without Chemicals	8	12	118
Outreach	4	12	794
Summer Camp	4	4	229
Special Events	2	3	1018
TOTAL	64	104	3659

Participant Numbers

Quarter	Pre K	Elem	Middle	High	Adult	Total #
Quarter 1	41	418	25	188	244	924
Quarter 2	1	122	1	4	141	(+688) = 957
Quarter 3	15	373	0	2	263	653
Quarter 4	23	446	7	5	314	(+330) = 1125
TOTAL	80	1359	33	199	962	3659

Note: numbers in parentheses are from special events, where ages of participants are not recorded.

Number of Surveys Completed in FY0910 = 386
63% were first time visitors
33% were repeat visitors

<u>Visitors rate programs on a scale of 1 to 5, 5 being highest</u>
1% rated programs 1-3
8% rated programs 4
51% rated programs 5

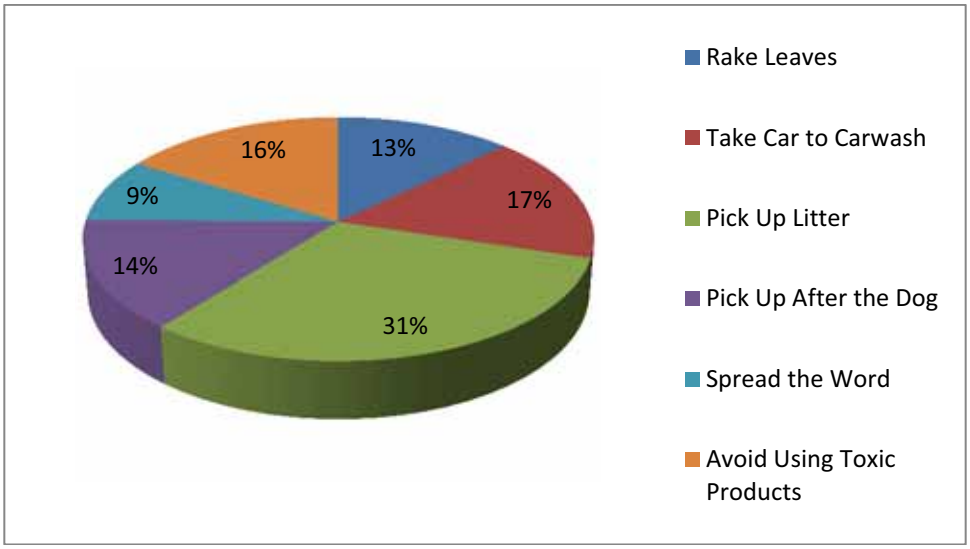
80% of visitors learned about urban runoff
80% of visitors learned about preserving and protecting South Bay habitats
73% of visitors learned something about watersheds

Visitor Demographics

Alviso	Campbell	Cupertino	Gilroy	Fremont	Los Altos	Los Gatos	Milpitas
1%	2%	6%	0%	5%	4%	3%	3%

Mtn. View	Morgan Hill	Santa Clara	San Jose	Saratoga	Sunnyvale	Other
2%	1%	10%	45%	1%	7%	10%

Bead Drop Display FY0910



2009 – 2010 Highlights

■ Participants really enjoyed our Earth Day Community Service project, clearing mustard from our native plant garden and restoration areas, while enjoying the beautiful weather and good company.

■ Shark Day was a great success, with over 500 participants enjoying the live leopard shark, games, mud lab, walks, story time, and making their own shark tooth necklaces. We even had a visit from Sharkie, the San José Sharks' mascot.

■ South Bay Bird Fest was another hit this year! About 330 participants enjoyed the live bird show, magic show, puppet show, face painting, and arts and crafts, which wouldn't have been possible without the 45 volunteers who helped out that day.

■ There was a significant increase in outreach events with the San José Public Library system that encouraged participants to visit the Refuge.

■ The smaller number of participants in relation to the previous fiscal year is due in part to attending less large-scale outreach events (USGS Open House).

■ The Children's Discovery Museum Summer of Service program has continued to help out at the Refuge by doing a tremendous amount of weeding, while still enjoying themselves by taking hikes and coloring their own tote bags to take home.

■ Summer camp was enjoyed by over 60 students this year, as they participated in fun activities, enjoyed healthy snacks, went out an urban runoff related scavenger hunt, and sang along to mucky marsh music at the overnight.

M. Attachments:

- Appendix A: Program Descriptions
- Appendix B: Watershed Watchers Proposed Work Plan for July 2009 – June 2010
- Weekend Program Flyers
- Event Flyers
- Tideline
- Visitor Survey

Appendix A: Program Descriptions

ABC's of Raptors
Participants learn all about raptors! The program begins with a slideshow that defines what a raptor is and what types of behavior raptors typically portray. Then the slideshow shows images of local or regularly spotted raptors and their physical characteristics are discussed. Participants learn how to identify raptors and learn about how humans impact raptors, especially how urban runoff pollution makes its way up the food chain. Finally, participants make a raptor ID guide by cutting and pasting local raptors into a book they can take home.

Advanced Bird Photography Workshop
Volunteer Paul Bridges takes over when Jen Woo left off. This 3-hour workshop will first address aesthetic issues (e.g., advanced composition) and nature (animal behavior, seasons, tides). Then the focus is on photography topics (exposure, depth of field, flash, etc.). Urban runoff pollution solutions are discussed at the beginning of the program, and "You are the Solution to Water Pollution" is distributed to all class participants.

All About Owls
Kids learn about owls through an interactive presentation and then dissect owl pellets. At the conclusion of the program, kids learn that owls can be adversely affected by urban runoff pollution and toxins that enter the food chain at lower levels.

An Eye for the Butterfly
Volunteer Intern Renee' Maningding leads participants in a discovery of all things related to butterflies: their life cycles, places in culture, habitats, etc. Participants can go on a walk through the Butterfly Garden and make their own Butterfly Life Cycle mobile. Urban runoff and how it affects butterflies is discussed.

Beginning Bird Photography Workshop
Jennifer Woo, a refuge volunteer, puts on a photography workshop for visitors interested in wildlife photography. A slide show is followed by a walk outside for practical application of skills. Urban runoff pollution solutions are discussed at the beginning of the program, and "You are the Solution to Water Pollution" is distributed to all class participants.

Beginning Bird Watching
Visitors start with a slide show to get to know the most typical birds spotted along the boardwalk trail. Methods of identifying birds in the field are discussed. Human impact on local birds through urban

runoff is explained and visitors are asked to name actions they could take at home to reduce storm drain pollution. The group then takes a bird walk around the EEC. Conducted by volunteer Ceal Craig.

Bike the Levees
Ed Kantack leads visitors on a bird spotting bike ride around the salt ponds. Prior to departure, participants received an interpreter-led session of the storm drain model and bioaccumulation simulator to learn about the consequences of urban runoff pollution.

Brownie Eco-Explorer Patch
The girls get a chance to go on a walk where they learn about Refuge habitats and its inhabitants. They fill out an "Explore Nature" sheet where the scouts mark off a checklist of living and non-living things found in the marsh. Then the girls come inside and learn about food chains and the bio-accumulation of toxins that enter the food chain through storm drain pollution. They make their own food paper ring salt marsh food chains. Finally, the girls get a chance to make bird feeders for the birds in their backyards.

Butterflies, Etc.
Children take an informal guided tour of the Butterfly Garden looking for butterflies or larva. Chemical free gardening is explained, along with benefits to butterflies and other living things.

Community Service
This is an open day for the general public. The audience usually consists of high school students who need to fulfill community service requirements. The groups are introduced to chemical-free gardening and its impact on aquatic environments, including salt marshes. Participants then work in the gardens planting native plants, pulling non-native plants, and mulching.

Discover Native Species
June Smith from the Native Plant Nursery takes visitors on a tour through the EEC's chemical-free native plant gardens. The program includes a discussion about designing a habitat for birds in your backyard, emphasizing the use of native plants, as well as detailed information about all the plants. Participants also learn how using chemical-free gardening methods protects wildlife in their neighborhood as well as wildlife throughout the watershed.

Drawbridge
Ceal Craig, a volunteer, gives a presentation about the historic town of Drawbridge. Urban runoff pollution is mentioned as one reason people abandoned the town. On a drive out to the viewing point, Refuge wildlife and habitats are discussed. People are reminded that urban runoff starts at their homes and techniques to reduce runoff pollution are suggested.

Exploring the Weep!
Volunteer Dr. Wayne Lanier leads a bike ride from the Marina to the research site of the Weep, a biologically rich site with a myriad of bacteria and algae growing. Bacteria, algae and water samples are taken, and participants get to look through field microscopes to get a closer look. The topic of urban runoff is discussed, as these organisms are easily affected by the actions of humans.

Habitat Exploration
Volunteer Ed Kantack leads a leisurely walk around the marsh at the EEC, looking for birds and other wildlife. Urban runoff pollution impacts and solutions are discussed at various stops along the way.

Junior Girl Scout Wildlife Badge
Girl Scouts earn their Wildlife Badge by visiting the Refuge and learning about food chains, wildlife specific to their local area, and using binoculars to study a wild animal. This is accomplished through the use of several games, hands on activities, taking a hike around the EEC studying habitats and looking for animals. The program also covers actions they can take at home to prevent urban runoff. Each participant states to the group an action they will take to help protect wildlife.

Lazy Days of Summer
Seasonal marsh walk around the EEC lets participants look for young wildlife and their families. Walk is led by wildlife enthusiast Ed Kantack. Urban runoff pollution impacts and solutions are discussed at various stops along the way.

Living Wetlands
Participants can learn about all the different habitats here are the Refuge, including salt marshes, former salt ponds, tidal and non-tidal sloughs. They also learn about human and wildlife dependence on wetlands. Urban runoff pollution impacts and solutions are discussed at various stops along the way. Program is led by Ed Kantack.

Making Tracks
This program teaches about animal tracks. At the start of the activity, each person makes their own animal track guide, then they take their guides outside to see what they can identify. All participants watch a watershed demonstration to illustrate how preventing urban runoff can protect the animals that make the tracks they have just studied.

Marshes, Mud and Plankton
Participants examine mud and salt pond water samples looking for macro invertebrates. The importance of mud creatures and plankton in the food chain is illustrated with food pyramids and a flannel banner activity. A Marsh walk follows the labs. Urban runoff pollution is identified as the culprit in unhealthy sloughs. People are asked to name actions they can take at home to protect macro invertebrates around the bay.

Monster Bacteria and Other Suspicious Critters
During this program, participants get a chance to step into the shoes of a scientist by exploring one of the salt marsh's hidden habitats. Dr. Wayne Lanier, a scientist for the San Francisco Exploratorium, starts with a short hike where participants take samples from the marsh waters and then participants examine these samples with field microscopes. Urban runoff effects on the bay habitats are discussed.

Night Sky Party
Amateur astronomers come to the EEC to educate and entertain visitors with a casual astronomy talk, fun activities, and a telescope viewing of the night sky. During the program, hot chocolate is served and the urban runoff pollution prevention box is discussed.

Ohlone Uses of Plants
During this program, volunteer Pat Hartinger discusses the plants that were traditionally used by the Ohlone Indians. She takes them on a guided tour through the native plant garden and discusses the importance of planting native plants.

Seasons and Weather

This is a new program developed by volunteer Ed Kantack, which talks about seasons and weather as related to the sun, the water, and everything else around us! He uses demonstrations to illustrate the tilt of the poles, how clouds are formed, as well as many other topics. Urban runoff material is handed out to participants.

Shorebirds

Participants learn all about shorebirds. Ed Kantack leads with a short slide show and then takes participants out on a hike to observe these interesting and sometimes comical Refuge visitors. Urban runoff plays a huge part in how well the animals survive, and methods for how humans can help are discussed.

Summer of Service

Partnership program between various youth groups and SCVURPPP position at the EEC. Kids spend a day at the EEC; they work in the gardens in the morning and explore the Refuge in the afternoon. Urban runoff pollution prevention ideas are discussed. They finish up by designing their own environmentally friendly tote to take home.

Quackers and Honkers

Visitors learn to identify the different ducks and geese that visit the refuge with an informative slide show. The difference between diving and dabbling ducks is discussed. Human impact on local birds through urban runoff is explained and visitors are asked to name actions they could take at home to reduce storm drain pollution. The group then takes a bird walk around the EEC. Conducted by volunteer Ed Kantack.

Water Water Everywhere

Ed Kantack's program is all about H_2O. This program covers the water cycle, including a working model used to demonstrate evaporation, condensation, precipitation, and runoff. Next, watersheds are addressed and participants get to observe the watershed model and learn about sources of urban runoff pollution. Everyone gets to make their own watershed model to take home.

Webelos Naturalist Badge

Webelos earn their Naturalist Badge by visiting the Refuge and learning about food chains, wildlife specific to their local area, and using binoculars to study wild animals. This is accomplished through the use of several games, hands on activities, taking a hike around the EEC studying habitats and looking for birds. Prior to the walk, the scouts make bird field guides which they use on their walk. The program also covers actions they can take at home to prevent urban runoff. Each participant states to the group an action they will take to help protect wildlife.

Appendix B: Watershed Watchers Proposed Work Plan for July 2009 – June 2010

WATERSHED WATCHERS PROGRAM TITLE AND GOALS JULY 2009 – JUNE 2010	METHODS AND OBJECTIVES OF PROGRAMS
Public Programs at the EEC- Wildlife in our Watershed Depends on You **Goal:** Interpretive programs offered to the public, focusing on how individual behaviors cause urban runoff pollution and affect wildlife habitat in our watershed.	Offer a variety of programs for adults, children, and families. These programs can include but are not limited to nature walks, hands-on activities, puppet shows, holiday programs, and other interpretive programs. These programs change frequently. **Objective:** Participants will state various ways they can protect the refuge
Group Programs at the EEC- Our Role in Preventing Urban Runoff Pollution **Goal:** Interpretive programs focusing on each individual's role in preventing urban runoff pollution, including examples of alternate behaviors.	These programs will be conducted for senior groups, youth groups, birthday parties, special interest clubs, college groups, day care, after school programs, and other local organizations. These programs will be reserved in advance by the group. **Objective:** Participants will state two examples of actions they will try at home to prevent urban runoff pollution
Special Events **Goal:** These all day events are designed to attract at least 200 people to the EEC for various activities educating about urban runoff pollution prevention.	These two events include Shark Day in October and International Migratory Bird Day (IMBD) in May. Planning for these two events begins 3-6 months in advance. Thus much of the prep work for Shark Day will be in the first Quarter and prep work for IMBD will be in the third Quarter.
Outreach **Goal:** Participating in outreach activities helps spread the word about the urban runoff pollution prevention program and provides opportunities for people to learn about how to prevent urban runoff pollution in the watershed.	Outreach activities include festivals, fairs, watershed clean-ups, or off site interpretive programs.

WATERSHED WATCHERS PROGRAM TITLE AND GOALS JULY 2009 – JUNE 2010	METHODS AND OBJECTIVES OF PROGRAMS
Stewardship at the EEC- Gardening without chemicals and Coastal Cleanup **Goal:** Stewardship activities encourage and inspire visitors to create wildlife habitats and use chemical-free garden techniques in their own backyards. Coastal Cleanup also helps participants connect their trash habits with the effects on the environment and wildlife.	These stewardship activities include garden work days emphasizing chemical-free gardening techniques and garden workshops that guide visitors through various native plant demonstration gardens around the EEC, while discussing chemical-free gardening techniques used in the gardens and implementation methods for the home garden. Coastal cleanup involves volunteers seeing the effects of urban runoff trash on coastal environments and wildlife. Trash is now the largest source of urban runoff pollution.
Informal Indoor Visitor Contact **Goal:** Includes interaction with visitors at the EEC, answering questions over the phone and in person.	Assist visitors over the telephone and in person. Provide excellent customer service to all visitors.
Distribution of Specified Programs to Local Media **Goal:** Contact and distribute informational fliers, press releases, and other programmatic information about the urban runoff pollution prevention program to local media such as, Bay Area Parent, Mercury News, as well as local newsletters and websites.	Create and distribute a listing of programs on a regular basis to provide to Bay Area Parent, online calendars, websites, local newsletters and newspapers. Write press releases and informational fliers to distribute for special events. Conduct follow-up calls to ensure information is posted.
Developing and Maintaining Partnerships with Local Community Organizations **Goal:** Maintain and create partnerships with local community organizations via phone calls, emails, and in person meetings to groups such as San Jose Community Gardens, the San Francisco Bay Bird Observatory, Audubon, Guadalupe River Parks and Gardens, Nortel Networks, Intel, etc.	This takes place throughout the year, however, the key time for working directly with these groups is for International Migratory Bird Day (IMBD) in May and for the chemical-free garden stewardship projects. During the rest of the year, relationships are maintained through the exchange of information and collaboration on issues related to urban runoff pollution prevention and wildlife.
Coordinating Refuge Volunteers for Interpretive Programs/ Gardens **Goal:** Work with and maintain ongoing relationships with volunteers at the Refuge. Work with volunteers that: lead programs; maintain the chemical – free gardens; and assist with special events.	Work with the Volunteer Coordinator to recruit, meet with and provide on the job training for volunteers that have an interest in leading programs and working to maintain the chemical-free gardens. Work directly with and maintain relationships with long-term volunteers who lead programs and work in the gardens.

WATERSHED WATCHERS PROGRAM TITLE AND GOALS JULY 2009 – JUNE 2010	METHODS AND OBJECTIVES OF PROGRAMS
Marsh-In Summer Camp **Goal:** This week long camp is designed to provide opportunities for young campers to learn about and connect with the wetland habitats, animals and plants, and to introduce them to how individual behaviors cause urban runoff pollution and affect wildlife habitat in our watershed.	This includes acting as a leader and assisting in program planning for the one week annual summer camp that encourages participation of students from the local elementary school in Alviso.
Program Activity Kits **Goal:** Continue to develop self contained Activity Kits in durable plastic storage containers to improve overall program efficiency.	Many programs and activities have been developed over the years and they are offered on a regular basis. The supplies and equipment used for each program are gathered each time the program is offered. This takes time. It would improve overall efficiency to have all supplies and equipment needed for each program or activity stored in a labeled plastic storage tub. These programs and activities are used for Public Programs, Group Programs, Special Events, Outreach, Volunteers, and Summer Camp. **Objective:** For each activity, determine equipment and materials needed, acquire storage tubs and necessary supplies so each activity is completely self-contained and ready to go off the shelf. Develop scripts as needed.
Program Research and Development **Goal:** Research and development time necessary for the creation of new urban runoff pollution prevention programs and learning new information to supplement and expand existing programs. This also includes time spent planning and scheduling future programs.	Time spent reviewing historical program offerings and analyzing the results of evaluations to plan future programs to maximize attendance and the variety of programs. This includes researching programs, and participating in free program development trainings (in house or local) to expand knowledge of the subject, create and develop new ideas for programs. As well as time spent learning information for specific programs by reading and researching topics, and communicating with knowledgeable staff and volunteers for additional information related to the program topic.

PROGRAM TITLE AND GOALS	QUARTER 1 JULY – SEPTEMBER 2009 OBJECTIVES	QUARTER 2 OCTOBER - DECEMBER 2009 OBJECTIVES	QUARTER 3 JANUARY - MARCH 2010 OBJECTIVES	QUARTER 4 APRIL - JUNE 2010 OBJECTIVES
Public Programs at the EEC - Wildlife in our Watershed Depends on You	7 programs	6 programs	5 programs	7 programs
Group Programs at the EEC - Our Role in Preventing Urban Runoff Pollution	7 programs	5 programs	4 programs	5 programs
Special Events	Conduct planning for special event	1 special event conducted	Conduct planning for special event	1 special event conducted
Outreach	1 outreach opportunity	1 outreach opportunity	1 outreach opportunity	1 outreach opportunity
Stewardship at the EEC- Gardening without Chemicals, Coastal Cleanup	2 programs (possibly 1 coastal cleanup)	2 programs	2 programs	2 programs
Informal Indoor Visitor Contact	Ongoing Activity	Ongoing Activity	Ongoing Activity	Ongoing Activity
Distribution of Specified Programs to Local Media	Ongoing Activity	Ongoing Activity	Ongoing Activity	Ongoing Activity
Developing and Maintaining Partnerships with Local Community Organizations	Ongoing Activity	Ongoing Activity	Ongoing Activity	Ongoing Activity
Coordinating Refuge Volunteers for Interpretive Programs/ Gardens	Ongoing Activity	Ongoing Activity	Ongoing Activity	Ongoing Activity
Marsh-In Summer Camp	Implemented this quarter	N/A	N/A	N/A
Program Research and Development	Ongoing Activity	Ongoing Activity	Ongoing Activity	Ongoing Activity

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 7-7

Zun Zun School Assemblies for Watershed Watch – FY 09-10

- ZunZun Assemblies for Watershed Watch-FY 09-10 Academic Year Final Report
- Memorandum- Evaluation of the School Assembly Program for FY 09-10

September 15, 2010

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ZunZun Assembly Programs for Watershed Watch
FINAL REPORT 2009-2010 School Year
June 30, 2010

ZunZun performed "The Musical Watershed" in Watershed Watch's service area in the 2009-2010 school year. ZunZun performed fifty assemblies at 26 schools, Pumpkins in the Park, and the Water Wizards festival. Visiting approximately 13,267 students at elementary schools, plus the audiences at Pumpkins in the Park and the Water Wizards festival, ZunZun saw **14,161** young people this year to share information about the Santa Clara Valley watershed—what it is, where students are in their watershed, how to keep it clean, and how to protect the watershed.

OUTREACH

Using the list of target schools provided by Watershed Watch, ZunZun advertised this year's program to the principals and assembly coordinators at eligible elementary schools. ZunZun faxed or emailed a flyer to the school contact person and then followed up to answer questions and book assemblies. Schools booked directly with ZunZun and a monthly performance update was sent to Vishakha Atre.

One month before each school's scheduled assembly, we emailed a confirmation letter and sent the vocabulary lists and newsletter article to the school contact person. One week before the scheduled performance we called the school to confirm show times.

SUPPLEMENTAL MATERIALS

Supplemental materials to aid in retention of the assembly information were sent to each school one month prior to the assembly. A vocabulary list for grades K-2 and another for grades 3-6 were emailed to the contact person to be distributed to the teachers for use before and after the performances. A newsletter article about the performance was also sent. Including this in their school newsletter, schools helped inform families about the presentation, so that parents could ask questions about what the students learned about watershed pollution prevention and facilitate discussions at home about Watershed Watch's message and the ZunZun show. At every assembly, the performers also handed out two post-assembly activity sheets and the Watershed Watch pamphlets and evaluation postcards.

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PERFORMANCES

As always, we designed our assembly segments to be interactive and to appeal to the many learning styles of the students, so there are always visuals, call and response, movements, comedy, and lots of fun information and facts. All assemblies were in English and Spanish, with a greater emphasis on Spanish whenever necessary. Each assembly was 45 minutes in length and introduced students to the topic of watershed. The segments were as follows:

Watershed Instruments from Around the World

The show began by showing **water instruments** from all over the world that represent watershed sounds, while we explained how important and precious clean safe water is all over the world. We showed instruments from North and South America, Africa, and Asia that represent the sounds of rain, storms, water in rivers and streams, and finally the ocean. This "water music" segment served as a great jumping off point to explain the importance of the watershed and to show how cultures worldwide depend on their watersheds.

Watershed Saving Dances

We used this segment to have all students and teachers take a turn doing a comic dance, then explaining why "sometimes we don't like that dance!" The first dance was the "Jellyfish". Here the students wiggle like jellyfish, and after we explain that sometimes this dance is not great because the jellyfish is really a plastic bag. We then explain how to prevent plastic bags from entering our watershed and why this is so important to protecting the watershed. We get to kids to remember about bringing their own bags and recycling the plastic bags that do end up in their homes. The second dance is the "Car Wash," which we get the teachers to do (they act like they are washing the car). Here we explain that car washing is fine, but it is best not to use very much soap, or better yet no soap at all, as it enters area storm drains which connect into creeks and rivers and into the bay. We use this segment to then show the audience the difference between a storm drain and the sewer. The third dance, done by the teachers, is the "Rainbow Dance." After the dance, we say we love seeing rainbows in the sky, but when you see a rainbow on top of water, it is usually oil that has leaked from a car. Then we go on to help audience members to think of ways to prevent oil from going into the watershed.

Fish Flies to Audience

After explaining how pollutants go into storm drains and go through our watershed, we reiterate those facts with the flying fish activity. We show as if we are dumping oil

Celebrating The Environment and Culture
Zun Zun
Through Music

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down the storm drain on the backdrop, then we have the audience remind themselves of the path that oil would take, from the storm drain, to a creek, then a river, the bay, and then the ocean. (We specify the particular path based on the local geography.) Then we see a black blob of oil enter into the ocean section of the backdrop and from backstage some fish begin flying out of the water, unhappy to be in the oil. We repeat the same steps with paint and garbage, see the paint and garbage make it to the ocean, and this time the fish not only flies up into the air, but out into the audience. It is perhaps the most memorable aspect of our assembly! Kids love this segment. We refer to this activity in our parent newsletter to help students with recall and give parents a chance to hear about assembly content.

Dirty Water

This is a call and response song where we have students come in front while the audience sings the call and response. The whole audience sings
"Dirty water, down the storm drain, goes to a creek which reaches the sea where the fish are swimming. They start to feel sick, the poor poor fish, it makes you think."
The song is repeated three times as the students dance faster and faster.

"Hour After Hour", 2,500,000 Bottles

The next activity was the "so many bottles thrown away" segment. We showed how many plastic water bottles were thrown away every hour in the U.S. using a place value activity. Three students came up initially, held a 2, a 5 and a 0 (two hundred and fifty). We would say "Is that it? No there's more- we need another volunteer!" By adding a zero each time the number grew and grew until we reached 2,500,000. This is the number of plastic bottles estimated to be thrown away, not recycled, every hour in the U.S. We used this segment to reiterate keeping the watershed clean (not throwing the bottles away, recycling them) and also to encourage families to use tap water. We explain that plastics in our watershed do not biodegrade for hundreds of years and we encourage kids to use re-useable, metal water bottles. This activity was appropriate for older grades, 3rd and up, who have studied or are studying place value.

Agua Batucada

We talked about getting water in pipes to our houses, but then said 47 % of the people on Earth do not get water in pipes and we showed two water carrier/container instruments: an "udu pot" from Africa and the "wash tub bass" from the United States. Then we showed the type of water containers kids do use–plastic water bottles. We reminded kids to use reusable bottles rather than disposable, reminded them how much water they could save by not using plastic bottles (it takes 5 bottles of water to make one disposable bottle of water) and reminded them that 2,500,000 are thrown

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away an hour, so please recycle the ones they use. Then we did the "agua batucada" where some students played music on the bottles while teachers and the rest of the students did a water celebration dance.

High Tide/ Low Tide Limbo

Using steelpan and marimbula, two instruments made from recycled things that come from the Caribbean, we celebrate our bay getting cleaner because of the actions of the audience. This segment allows us to define the San Francisco Bay as an estuary where fresh water drains from our towns and cities and mixes with salty water from the Pacific Ocean. We help students know there are two high tides and two low tides per day, with the low tides exposing mudflats which are a rich habitat for egrets, herons, and other animals to get food. Students then come up for the limbo and they act as though they are fish under a high tide with lots of water and under a low tide.

FOLLOW-UP AND EVALUATION

ZunZun hands out the Watershed Watch evaluation postcards to the teachers at each assembly. These are then sent directly to Watershed Watch for analysis.

On-site feedback was very positive this year. Schools are very appreciative of a free assembly program, especially one that incorporates the Arts since that has been cut or reduced from so many schools budgets.

The mid-year report showed positive feedback as well. Because the evaluation postcards are sent directly to Watershed Watch, we have not seen the comments and scores from January –June 2010.

POSSIBILITIES FOR NEXT YEAR

We look forward to working with Watershed Watch again in the 2010-2011 school year! Thank you for your continued support of our assembly programs.

After assemblies teachers and students are always very excited about watershed protection and watershed pollution prevention. We would love to encourage more action at the classroom level with a follow-up activity sheet that would include the following:

1) Suggest an on-site "field trip" at their school where students walk together to find all the storm drains on the school campus. They return to class and draw

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maps with the storm drains (CA State Standard re: map creation and use). Then dedicated classes can even monitor the storm drains throughout the school year to see what goes down the storm drain at their school and then decide how to prevent the pollution.

2) How to create a "Basura Batucada" band.

3) Suggest visiting some of the wildlands near their homes and the watershed in their area with their families.

Celebrating The Environment and Culture
ZunZun
Through Music

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ZunZun Assembly Update FY 09-10

	Date	School	No. of Shows	Time	No. of students	City
	9/22/09	Cumberland	2	1:05 & 1:40	600	Sunnyvale
	9/25/09	Cedar Grove	2	9:00 & 10:00	750	San Jose
	10/10/09	Pumpkins in the Park	2	1:15 & 2:45	600	San Jose
	11/6/09	Eaton	2	9:45 & 11:00	650	Cupertino
	11/13/09	Summerdale	2	8:50 & 9:50	540	San Jose
	11/18/09	Los Alamitos	3	9:10, 10:00, 10:50	730	San Jose
	11/20/09	Segwick	2	10:10 & 11:25	500	Cupertino
	12/10/09	Marshall Lane	2	1:00 & 1:45	550	Campbell
	12/14/09	Stipe	2	1:00 & 1:45	470	San Jose
	12/17/09	Capri	2	9:00 & 10:30	600	Campbell
	1/6/10	Meyerholz	2	1:05 & 2:05	650	San Jose
	1/21/10	Laneview	2	8:45 & 9:45	530	San Jose
	1/26/10	Edenvale	2	8:45 & 9:45	600	San Jose
	1/27/10	D.I Meyer	2	8:30 & 9:30	630	San Jose
	210/10	Lincoln	2	10:15 & 11:20	705	Cupertino
	2/12/10	Toyon	2	8:45 & 9:45	405	San Jose
	3/17/10	Vargas	2	8:30 & 9:30	520	Sunnyvale
	3/22/10	Union Middle (6th grade)	1	10:45	260	San Jose
	4/1/10	Northwood	2	9:00 & 10:05	450	San Jose
	4/2/10	Weller	2	8:45 & 9:45	450	Milpitas
	4/23/10	Discovery Charter	1	9:00	110	San Jose
	5/12/10	Dilworth	2	9:15 & 10:30	461	San Jose
	5/25/10	Foothill	1	9:00	380	Saratoga
	5/26/10	Water Wizards	1	11:45	294	San Jose
	5/28/10	Montague	1	10:45 AM	350	Santa Clara
	6/3/10	Ohlone	1	10:30 AM	176	Palo Alto
	6/3/10	Stocklmeir	2	12:50 & 1:40	700	San Jose
	6/4/10	Argonaut	1	8:30 AM	500	Saratoga
			50		14161	

MEMORANDUM

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

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TO: Schools and Youth Outreach Work Group

FROM: Vishakha Atre and Jill Bicknell, Program staff

DATE: July 20, 2010

SUBJECT: **End-of-Year Evaluation of the School Assembly Program**

In FY 09-10, the school education assembly program completed its eight year of implementation. Each year, the Schools and Youth Outreach Work Group develops a target list of schools for ZunZun to contact. During FY 09-10, ZunZun conducted 47 assemblies at 26 elementary schools in eight cities. In addition, two assemblies were conducted at the Pumpkins in the Park event for the general public and one at the Water Wizards festival in San Jose. The assemblies reached approximately 14,161 students and their teachers in grades K-6.

The vocabulary lists (one for students grades K-2 and another grades for 3-6) were faxed to each school before the assembly. Teachers were requested to familiarize the students with the vocabulary words. ZunZun also continued distributing postage-paid survey cards to teachers attending the assemblies. The Program received 130 completed evaluation cards this year. Teachers were requested to indicate the grade level of students taking the survey on the cards. Of the 234 cards received, 66 cards were from K-2 teachers and 45 from 3-6 teachers. There were also 19 cards where the grade was not indicated. As requested by the Work Group, results are presented as “grades K-2”, “grades 3-6” and “overall”.

Results of the survey, along with comments and suggestions received from teachers are listed below.

111 West Evelyn Avenue, Suite 110 • Sunnyvale, CA 94086 • tel: (408) 720-8833 • fax: (408) 720-8812
1410 Jackson Street • Oakland, CA 94612 • tel: (510) 832-2852 • fax: (510) 832-2856
1-800-794-2482

ZunZun Survey Results
(130 responses)

1. What percentage of your students know what a watershed is?

	25%	50%	75%	100%
Grades K-2 results	23%	17%	39%	17%
Grads 3-6 results	7%	22%	44%	27%
Overall results**	20%	17%	39%	22%

***The overall results include survey cards where grades were not indicated.*
Note: Not all teachers mark all answers, so numbers do not always add up.

2. What percentage of your students can name a way to prevent pollution in the watershed?

	25%	50%	75%	100%
Grades K-2 results	3%	2%	32%	58%
Grads 3-6 results	0%	4%	24%	71%
Overall results**	2%	6%	29%	60%

***The overall results include survey cards where grades were not indicated.*
Note: Not all teachers mark all answers, so numbers do not always add up.

3. How would you characterize the content of the assembly?

	Educational	Balanced	Entertaining	Neither
Grades K-2 results	14%	86%	0%	0%
Grads 3-6 results	11%	89%	0%	0%
Overall results**	12%	87%	1%	0%

***The overall results include survey cards where grades were not indicated.*
Note: Not all teachers mark all answers, so numbers do not always add up.

Sampling of Comments:

Grades K-2 comments

- A wonderful assembly. Both adults and kids loved it. Highly recommend it!
- It was a wonderful, well-planned presentation.
- ZunZun rocks!
- It is a great idea to provide teachers with vocabulary sheets before hand to help with preparation.
- My students are disabled – they were entertained by the assembly, but not informed – it was too fast paced for them.
- The students enjoyed the music with instruments used to help teach about the watershed.
- Many of my students are EL learners and needed more reinforcement and review for this concept. Excellent presentation that kept students entertained while learning content! Great because it was English and Spanish!
- This was one of the best assemblies I have seen. The children were totally engaged and learned a lot!
- The assembly was very educational and fun! The musicians definitely got their message across and put a lot of effort into their performance.
- Great program. My kindergarten students were actively engaged and walked away with new concepts.
- Children loved the dancing and singing. We enjoyed the young boy playing the drums. Also we enjoyed the various instruments. The kids said they learned a lot about the watershed!
- The presenters were well educated on the topic and shared material in an interactive and entertaining format.
- Thank you – One of my students went home and told her mother all about it. Very impressive! The bilingual part was great. Too bad everything was a little rushed due to time.
- What a fun way to introduce such a serious topic to these students!
- Awesome – very accessible and age-appropriate for K/1 – music and movement integrated with message.
- Some of the vocabulary was a little advanced for 1st grade but we enjoyed the show and got the message that we shouldn't pollute the water.
- Best assembly in my 12 years at Meyerholz – really excellent!
- We really liked this assembly! Our kinder students started talking about how to help earth although they did not completely understand the vocabulary of "watershed".
- Great use of music and humor to deliver an important message. Gwen and Steve were fantastic! All 400 of our K-5 students were engaged through the assembly. My own kids – 4th, 2nd, and preschool – remembered the information delivered! Thank you!

Suggestions:

- Would have been great to have the assembly earlier in the year.
- A slower pace will make it better for all.
- We love your program but one change would be to not imply things are easy because for some students the concepts are difficult to understand.
- Great job! Move drums because we couldn't see behind you at the map.

Grades 3-6 comments

- The assembly was excellent – fun and educational!
- Wow! I was so impressed! Also inspired – I'm going to try and include more humor in my lessons.
- Thank you for coming to our school and for teaching in an entertaining way!
- Very fun integration of music and environmental education. Excellent content and management of kids. They loved it and learned a lot.
- Loved all the musical dancing and inclusion of teacher participation.
- Very entertaining and informative – my 3rd grade students really enjoyed it!
- The length of the assembly was perfect. Fantastic audience participation!
- My students and I thought it was great!

Suggestions:

- It was great! I like the student involvement. Only a little more music would improve it.
- Have directions on how to make the instruments. And include more volunteers, songs, and dances!
- I would like my students (and myself) to learn exactly what to recycle. For example tooth paste tube – recycle or not? A wet paper towel? Does everything recycled have to be clean?
- Watershed was a term that did not stick. More explanation needed. Storm drain and sewer stuck with them.

Comments from cards with grades not marked

- The student's responses were intelligent after the assembly. Good job of the balance of music and language.
- It was fun! The message was very student-friendly in their language.
- Awesome show! Good for all ages!
- Teachers at Argonaut unanimously agreed that this was the best assembly we've had in years!
- The students really enjoyed it and were very attentive.

Suggestions:

- Slow down when enunciating new terminology.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 7-8

FY 09-10 Regional Media Relations Activities

- Mercury News Column
- Mercury News Response
- BASMAA Media Relations Campaign Final Report

September 15, 2010

The Mercury News
MercuryNews.com

Action Line: Neighbors drain their pool the wrong way

By Dennis Rockstroh
drockstroh@mercurynews.com

Posted: 02/06/2010 12:00:00 AM PST

Q In spite of telling my neighbors numerous times to pull the hose all the way to the street in order to drain water from their pool, they don't.

They drain directly in front of the house.

The result is the street as well as our front and side yards get so much water.

Also, our sump pump has all the more work to do.

Sarla

Sunnyvale

A Both methods are wrong, Sarla, but there are proper ways to do this.

Thanks for bringing this up because pool season is coming up and some folks might need to drain their pools.

Pool water should never be drained to the street or the storm drain.

Storm drains in the Bay Area typically run into local creeks, rivers and the bays.

In most places, it's against the law to drain pools and spas this way because pool water contains chemicals that can endanger or kill wildlife.

To empty a pool, one needs to call a pool service company or find your "sanitary sewer clean-out" and direct the water there.

That line leads to the sewer system and the water is treated before it is released for recycling or into the bay.

So where is your sanitary sewer clean-out?

Here are some tips I found on the city of Sunnyvale's Web site (http://sunnyvale.ca.gov/Departments/Public +Works/Water+ Pollution+Control+Plant/Draining+P ools+and+Spas.htm).

Or, do a Web search for "California draining water from pools."

If your kitchen or bathroom is on an exterior wall of your house, look outside along that wall for a clean-out.

Stand on the sidewalk looking toward your house. Line up the main water sources in your house (bathrooms, kitchen, washers, etc.). The clean-out is often located on that line, in front of or behind your house.

Look for an "S" carved on the curb near your house. It marks where the sewer line is. Your clean-out may be along it.

Look on your property for a small concrete or metal cover marked "sewer." Clean-outs are often located under them.

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The Mercury News
MercuryNews.com

Look for a small circular cap on a pipe, with a raised square on it, protruding out from one wall of your house, or out of the ground. These caps often cover clean-outs.

Look for a slight linear depression in your yard between your house and the street. They are often remnants of sewer line installation, and your clean-out may be on it.

If you are on a septic system or do not have a sanitary sewer clean-out, contact the Sunnyvale Water Pollution Control Plant at 408-730-7260 or your local government offices.

Pass this information on to your neighbor, Sarla.

Tell your friends.

Here is how to reach Action Line:

Mail: San Jose Mercury News, 750 Ridder Park Drive, San Jose, CA 95190

E-mail: actionline@mercurynews.com

Fax: 408-288-8060; phone: 408-920-5796; follow me at Twitter.com/action_line .

Please include full name, address and phone number.

Because of the volume, I cannot respond to all requests.

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The Mercury News
MercuryNews.com

Action Line: Company gets 'F' from customer, Better Business Bureau

By Dennis Rockstroh
drockstroh@mercurynews.com

Posted: 02/24/2010 12:00:00 AM PST

Q Hi Dennis, My fiancee and I ordered a coffee table from modabode.com , a San Francisco-based furniture sales site, in early November of last year.

The table finally arrived on Dec. 24 in a condition that could only be described as destroyed — scratched, all corners smashed and the internal structure shattered.

When we spoke to customer service and asked for a refund, we were told repeatedly to look at the terms and conditions: No refunds, they could ship us another table.

I spoke to a supervisor who assured me that if the table again arrived destroyed, we would receive a full refund.

Fast forward to mid-January, when our new table arrived smashed up and with holes torn in the box.

I again e-mailed pictures to the company.

Now, I cannot get my calls answered or get help from anyone.

We paid $800 for this table, and now I have two damaged tables, which they refuse to pick up despite the Web site stating they will pick up any damaged goods.

Please help us. We just want fair treatment!

Evan Mills

San Jose

A I sent your complaint to the company, Evan.

"As of today, we have refunded the customer in full. We have worked with this customer all the way through this process, and have done our best to make the customer happy," the company responded by e-mail.

Didn't happen.

To be continued.

Meanwhile, this is a company to avoid. Its rating with the Better Business Bureau — F.

Q Thank you for your response to Sarla, who wrote about draining pool water to the streets (Action Line, Feb. 6). I am writing to you on behalf of the Santa Clara Valley Urban Runoff Pollution Prevention Program, a coalition of 15 local government agencies that work together to prevent the pollution of our creeks and the bay. As you correctly stated, storm drains carry storm water away from streets and roads directly to local creeks and the bay, without any cleaning or filtering. They are not a disposal outlet for pool water. Draining pool water to the sanitary sewer is the preferred method.

Residents can call their local cities to find out information on draining pools or spas. Contact numbers for all Santa Clara Valley cities are available

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The Mercury News
MercuryNews.com

online in our "Draining Pools and Spas" brochure at www.mywatershedwatch.org/pdf_files/poolsbro.pdf . The Watershed Watch Web site, www.mywatershedwatch.org , is a good resource.

Jill C. Bicknell

Santa Clara Valley Urban Runoff Pollution Prevention Program

A You get the last word, Jill.

Here is how to reach Action Line:

Mail: San Jose Mercury News, 750 Ridder Park Drive, San Jose, CA 95190

E-mail: actionline@mercurynews.com

Fax: 408-288-8060; phone: 408-920-5796; follow at Twitter.com/action_line

Please include full name, address and phone number.

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BAY AREA STORMWATER MANAGEMENT AGENCIES ASSOCIATON

Media Relations Program

March – June 2010

Final Report Submitted by

O'Rorke Inc.

Overview

O'Rorke Inc. was hired by the Bay Area Stormwater Management Agencies' Association to conduct three media pitches to satisfy media relations work as outlined in the MRP.

O'Rorke participated in meetings with the PIP committee to determine the pitch topics and then developed strategies for each working closely with project manager, Sharon Gosselin.

The three pitch topics were:

- pesticides
- car washing
- litter, relating specifically to plastic bags

Coverage

In all, the three pitches resulted in thirty-eight media placements: six in print; eleven on the radio; and twenty-one online (this included radio station and newspaper websites).

What follows is a brief synopsis of each pitch strategy and the coverage results. Attached are individual media reports for each pitch.

Pesticides

Working with the media relations campaign project manager, O'Rorke strategized a pitch on pyrethroid pesticides. Using materials developed for Our Water Our World, O'Rorke wrote a release about pyrethroids emerging as a new force in the market and detailed information about how one chemical will be banned only to have a new one take its place.

The pitch resulted in six placements. The Alameda Sun ran the story with the headline, "Exercise Caution When Choosing Pesticides." Another coverage highlight

included Geoff Brosseau's interview on KMKY (Radio Disney), a station that has good reach among women because mothers listen to the station with their children.

Car Washing

To promote using professional car washes or simply washing on grass or gravel instead of paved surfaces, O'Rorke focused on a public-affairs driven pitch with prepared PSA copy as the cornerstone.

This was very effective. PSAs aired on five stations, including the high profile KCBS and KOIT. Additionally, translating the PSAs allowed O'Rorke to secure placement with KIQI, a Spanish language station. Numerous stations included the PSA copy on their websites and Sharon Gosselin was interviewed on the subject by KEAR.

Overall, this pitch resulted in fourteen placements.

Litter/Plastic Bags

Because litter is such a major issues facing stormwater programs, this was an important topic to cover. Again working with the project manager and PIP committee, O'Rorke developed a press release focusing on plastic bags as a major source of litter and promoting reusable bags as a better choice. The release also featured several tips to help peopled remember to use their reusables.

For this pitch, O'Rorke used a two-pronged strategy. The first part consisted of doing "DJ drops" at five key radio stations. A DJ drop is when a press release and leave-behind is brought to a station's morning show along with some food and refreshments for the morning show crew. In this case, O'Rorke brought food, the press release and a few reusable chico-style bags to each station. The results were fantastic: two of the five stations covered the story that day. A third included some mention on air and requested copy to use online.

Coverage highlights included a two-minute discussion of plastic bags by Sarah & Vinnie of the immensely popular Radio Alice (KLLC) and a "Fog Files" segment on KFOG.

The second piece of the pitch consisted of sending the release out to other stations not covered by the drops and also to print. For print, O'Rorke also included a courtesy photo of a plastic bag on a storm drain. The second round of pitching resulted in several print and online placements. At this writing, two additional placements are still pending with Asian Week and Diablo magazine.

Overall, at this time, the litter pitch resulted in eighteen placements.

Media Coverage: Pesticides

Print

- Alameda Sun. "Exercise Caution When Choosing Pesticides." 4/29/2010.
- Danville Weekly. "Danville asks residents to think twice before buying pest control products." 5/18/2010.

Online

- Alameda Sun. "Exercise Caution When Choosing Pesticides." 4/29/2010.
- Danville Weekly. "Danville asks residents to think twice before buying pest control products." 5/18/2010.

Radio

- KEAR-AM. Interview w/ Geoff Brosseau completed Monday 5/10 at 8:15 a.m. The two five-minute segments aired Monday 5/10 at 11:04 a.m. and 4:04 p.m., and Tuesday 5/11 at 11:04 a.m. and 4:04 p.m.
- KMKY-AM (Radio Disney). Interview w/ Geoff Brosseau completed Wednesday 5/19 at 11 a.m. Scheduled to air first weekend in June.

Media Coverage –Car Washing

Online--PSAs

- KISS-FM (98.1)
- KMEL-FM (106.1)
- WILD 94.9
- KKSF-FM (103.7)
- STAR 101.3
- GREEN 960
- 910 KNEW

- KCBS-AM 740 – Online beginning 7/10, one (1) week prior to radio air date

Radio—PSAs and interview

- KMKY-AM (1310)
- KIQI-AM (1010)
- KCBS-AM (740) – 7/20-7/21; one (1) or two (2) times, Mon-Fri.
- KSQQ-FM 96.1 – Currently on air; 7/1 through next week
- KOIT-FM 96.5 – Running since 6/25; will continue to air for one (1) additional week from today 7/2
- KEAR-AM – Interview w/ Sharon Gosselin completed Thursday 7/15 at 10:00 a.m. The three five-minute segments will air Monday 7/19, Tuesday 7/20 and Wednesday 7/21

Media Coverage: Litter/Plastic Bags

Online

- KISS-FM (98.1)
- KMEL-FM (106.1)
- WILD 94.9
- KKSF-FM (103.7)
- STAR 101.3
- GREEN 960
- 910 KNEW
- PleasantonWeekly.com. "Grab Bag." Week of 7/12/10.
- TriValleyViews.com. "Grab Bag." Week of 7/12/10.
- San Ramon Express.com. "Grab Bag." Week of 7/12/10.
- DanvilleExpress.com. "Grab Bag." Week of 7/12/10.

Radio

- KLLC-FM (ALICE 97.3) – DJ Drop; on-air mention
- KFOG-FM (105.3) – DJ Drop; on-air mention
- KMEL-FM (106.1)

Print

- Lamorinda Weekly

- Orinda News (September)
- Rossmoor News
- Tri-City Voice

Pending

- AsianWeek
- Diablo Magazine

DRAFT

FOR IMMEDIATE RELEASE

CONTACT: Geoff Brosseau
(650) 365-8620

PRESS RELEASE

SPRING INTO ACTION
Bay Area Stormwater Agencies Ask Consumers to Exercise Caution When Choosing Pesticides

April 20, 2010—Spring has sprung. With Spring comes new life and new opportunities to make better decisions for your yard and garden and for the environment.

With all the new growth, pests are not far behind. As gardeners figure out how to keep pests from bugging them too much, the Bay Area Stormwater Management Agencies Association (BASMAA) is asking consumers to make careful choices when purchasing pest control products.

After the highly publicized voluntary recalls of diazinon and chlorpyrifos (Dursban) as home and garden pesticides, consumers could easily think that most products on store shelves are safer. But this is not the case. In the wake of the recalls a new class of pesticides has come into prominence: pyrethroids.

"We have a situation where some highly toxic chemicals were taken off the market only to be replaced by newer—and just as toxic—chemicals," says James Scanlin, chair of BASMAA. "It's a vicious cycle that can leave consumers very confused and has a negative impact on the environment."

Pyrethroids are a class of pesticide designed to kill a wide variety of pests, such as lawn grubs and ants. But pyrethroids are also highly toxic to beneficial insects like ladybugs, earthworms, and lacewings, which help to keep problem pests in-check. Once beneficial bugs are eliminated, pests are free to multiply without the natural checks and balances that beneficial insects provide. According to a 2010 report prepared for the San Francisco Estuary Project, pyrethroid pesticides "remain the highest priority….because they have been linked to widespread toxicity in California surface waters."

"Pyrethroids came into wider use after bans on chlorpyrifos and diazinon took effect," explains Mr. Scanlin "They are found in easily over 900 products." Yard and garden pesticides are a particular problem when it comes to stormwater pollution. Once they wash off from rain and watering, pesticides flow into storm drains, polluting local creeks and the Bay, harming fish and other aquatic life.

BASMAA, a consortium of stormwater programs in the San Francisco Bay region, wants to help residents make less-toxic choices while maintaining beautiful yards and gardens.

BASMAA offers these tips when dealing with garden pests:

- Try less-toxic methods before making a purchase. Go to OurWaterOurWorld.org for tips and information. Sometimes biological controls (like bringing beneficial bugs into your yard and garden) can do the trick without any chemicals.

- Read labels. The word "pyrethroid" will not appear on a label, but look out for the following active ingredients: permethrin, bifenthrin, cyfluthrin, cypermethrin, deltamethrin, lambdacyhalothrin, and tralomethrin. A quick tip: active ingredient names ending in "-thrin" are usually in the pyrethroid class. The exception to this is pyrethrin which is produced naturally from the chrysanthemum flower – though can still be toxic to aquatic life. To download a free pocket guide that gives examples of products without pyrethroids, go to OurWaterOurWorld.org

- When shopping, seek out the least toxic products. Look for shelf signs with the Our Water, Our World name and logo, which call out the best choices in each category. Participating stores include Orchard Supply Hardware, Sloat Garden Centers, Ace Hardware Stores, Home Depot, and many other local nurseries and garden centers. To find a store near you, go to OurWaterOurWorld.org.

Final BASMAA Carwash PSA's Spring 2010

A: Love washing your own car? Keep doing it – but wash it on the lawn or on gravel or go to a car wash. Here's why: When you wash your own car in your driveway or street, you're also washing off pollutants like copper from brake pads and other chemicals. In many places, this runoff goes right to the storm drain untreated and from there it pollutes our waters. At the car wash, runoff water is collected and treated. Check out baywise.org for more information. (:30)

B: Be green this summer. Instead of washing your car on the driveway, wash it on a lawn or gravel. Here's why: when you wash your car in your driveway or street, copper from brake pads and other chemicals wash off, too – right into the nearest storm drain and into the Bay – untreated. For more pollution prevention tips, check out baywise.org. (:20)

C: Love washing your own car? Keep doing it – but don't do it in your paved driveway or street, where water runs off into the storm drain. Try washing your car on a grassy area or gravel instead. Why? To limit runoff. When you wash your car, you're also washing off pollutants like copper from brake pads and other chemicals. From there, they go right to the Bay. See baywise.org for more information. (:30)

D: Be green! Wash your car on a lawn or gravel. Here's why: when you wash your car in your driveway, copper from brake pads and other chemicals wash off, too – into the nearest storm drain and the Bay – untreated. For more tips, check out baywise.org. (:10)

Draft

PAPER OR PLASTIC? NO THANKS, I'VE GOT MY OWN
Bay Area Stormwater Management Agencies in reusable bag push to reduce water pollution

June XX, 2010—With a plastic bag ban in the offing for California this year, the Bay Area Stormwater Management Agencies Association (BASMAA), wants residents to start taking action now to break the plastic bag habit.

"Noting 'bring bag' at the top of your shopping list is an easy addition," said James Scanlin of BASMAA, a consortium of municipal stormwater pollution prevention programs from around the region. "By the end of 2010, California may have a plastic bag ban in place, so we are prepping residents to start using reusable bags now."

By now, seeing a plastic bag perched on a tree branch or hugging the pavement near a storm drain is a normal sight. Often these bags find their way into storm drains, local waterways, and eventually the ocean. Plastic debris like this represents nearly 90 percent of floating marine debris, according to the California Coastal Commission.

"Plastic bags are a huge environmental issue," says Scanlin of BASMAA. "Plastic never breaks down. It's little bits of litter, including plastics, that have added up to the immense island of garbage floating in the Pacific." According to the Earth Resource Foundation, over 100,000 marine animals die from plastic entanglement each year because they mistake plastic bags for food.

An analysis by the California State Assembly shows that Californians use 19 million plastic bags per year. From their very production (which entails use of petroleum), to the litter they create, to the havoc they have wreaked on the world's oceans, plastic bags are a major environmental issue.

BASMAA is asking Bay Area residents to make a renewed push toward using reusable bags. There are incentives for consumers, too: While many supermarkets have long offered five-cent bag credits, big box retailers like Target are now doing the same.

BASMAA offers these tips to residents to ensure they have reusables at the ready:

- Keep a rolled up or Chico-style bag in your purse to have handy for quick shopping trips.

- Leave reusable bags by the front door near keys, cell phones and other must-have items.

- Place some in the trunk or on the front passenger seat of your car so they're easily available when running errands.

- Just say no! If buying a small item, just refuse a plastic bag from the store clerk.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 8-1

Bay Area Macroinvertebrate Bioassessment Information Network

- 9th Annual Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI) Meeting Agenda – February 16, 2010

9th Annual

Bay Area Macroinvertebrate Bioassessment Information Network (BAMBI) Meeting

Tuesday, February 16, 2010
10:00 AM to 3:15PM
Room 1, 2nd Floor, Elihu Harris State Office Building
1515 Clay St., Oakland, CA, 94612

MEETING AGENDA

9:45 Registration and Coffee/Tea

10:00 Welcome and Agenda Review
Arleen Feng – Alameda Countywide Clean Water Program

10:10 Bay Area Bioassessment Activities - Introductions and Summaries from Bay Area Agencies and Organizations - *Meeting Attendees (up to 5 minutes per attendee)*

10:40 Update of San Francisco Bay Area IBI Development -
Chris Sommers (EOA, Inc.) and Kevin Lunde (UC Berkeley PhD Candidate)

11:10 California Bioassessment Reference Condition Management Program -
Andy Rehn (California Department of Fish and Game)

11:40 Lessons Learned from Southern California - Regional Bioassessment Program -
Raphael Mazor (Southern California Coastal Water Research Program)

12:10 *Lunch (Provided)*

12:40 Contra Costa Macroinvertebrate Monitoring – B-IBI Scores and Antecedent Rainfall
Armand Ruby (Armand Ruby Consulting)

1:10 Results and Conclusion from a Decade of Bioassessment in Marin County -
Chris Sommers (EOA, Inc.) and Terri Fashing (MCSTOPPP)

1:40 Macroinvertebrate Response to Biotic and Abiotic Stresses in Freshwater Wetlands of the San Francisco Bay Area - *Kevin Lunde (UC Berkeley PhD Candidate)*

2:10 SWAMP Bioassessment and Physical Habitat Assessment (PHAB) Protocols – Current Practices & Issues - *Arleen Feng (Alameda Countywide Clean Water Program)*

2:40 SWAMP Bioassessment and PHAB – Discussion of Next Steps for Bay Area -
Arleen Feng (Alameda Countywide Clean Water Program) and Attendees

3:00 Wrap-up, Questions and Suggestions for the Coming Year

3:15 Adjourn

Driving Directions to Bambi Meeting

From San Francisco:
Distance: 8.8 miles Approximate Travel Time: 30 minutes

Go East on US 101 to I-80
Go Northeast on I-80 (Portions toll)
Take the I-80 EAST ramp.
Take the I-580 EAST exit towards HAYWARD/STOCKTON/DOWNTOWN OAKLAND/CA-24/ALAMEDA.
Merge onto I-580 E.
Take the I-980 WEST exit towards DOWNTOWN OAKLAND/(I-880 S).
Take the I-980 WEST exit on LEFT.
Take the 18TH STREET exit towards 14TH STREET.
Turn SLIGHT LEFT onto BRUSH ST.
Turn LEFT onto 17TH ST.
Turn RIGHT onto CLAY ST.

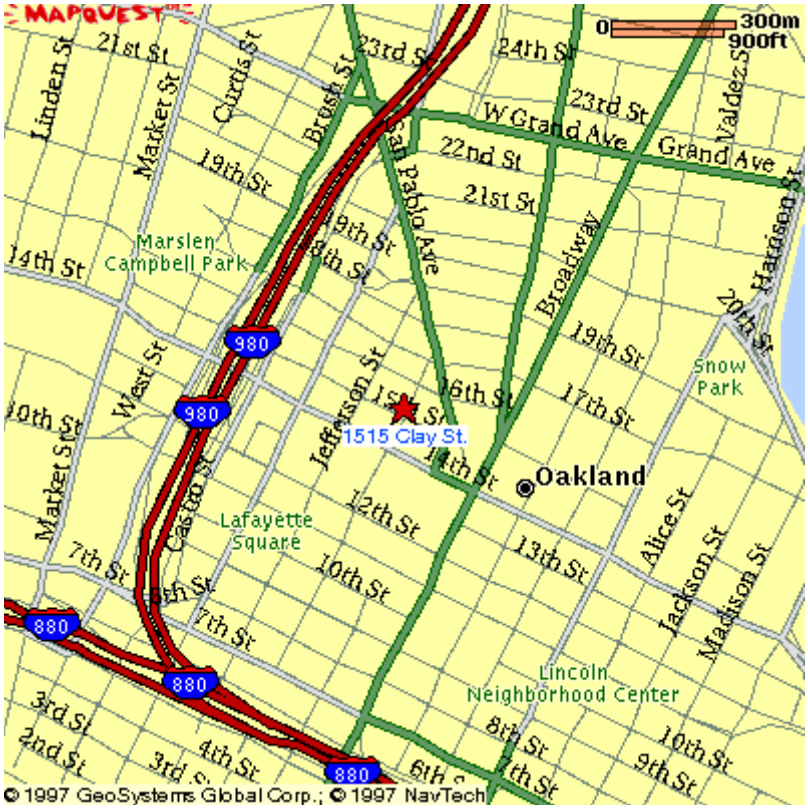
From Sacramento:
Distance: 80.6 miles Approximate Travel Time: 1 hour, 49 minutes

Go South on I-5 to I-80
Go Southwest on I-80 (Portions toll)
Merge onto I-580 E/I-80 W.
Merge onto I-580 E.
Take the I-580 EAST exit towards DOWNTOWN OAKLAND/HAYWARD
Keep LEFT at the fork in the ramp.
Merge onto I-580 E.
Take the I-980 WEST exit towards DOWNTOWN OAKLAND/(I-880 S).
Take the I-980 WEST exit on LEFT.
Merge onto I-980 W.
Take the 18TH STREET exit towards 14TH STREET.
Turn SLIGHT LEFT onto BRUSH ST.
Turn LEFT onto 17TH ST.
Turn RIGHT onto CLAY ST.

From San Jose:
Distance: 49 miles Approximate Travel Time: 1 hour, 9 minutes

Take the I-880 NORTH ramp.
Merge onto I-880 N.
Follow the signs to get onto I-980 E.
Take the 11TH ST exit towards 14th St.
Turn SLIGHT LEFT onto CASTRO St.
Turn RIGHT onto 14th St.

Turn LEFT onto CLAY St.



Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 9-1

IPM Store Partnership Program

- Store Employee Trainings and Increasing Shelf Space Projects – FY 09-10 Final Report
- List of Stores in the IPM Store Partnership Program and Training Dates
- SCVURPPP Pesticide User Outreach FY 09-10 Summary of Store Employee (not including Home Depot Employees) Training Evaluations
- SCVURPPP Pesticide User Outreach FY 09-10 Summary of Home Depot Employee Training Evaluations

September 15, 2010

STORE EMPLOYEE TRAININGS AND INCREASING SHELF SPACE PROJECTS

FY 09-10 FINAL REPORT

Ann Joseph Consulting

Since FY 02-03, SCVURPPP has been using the services of Ms. Ann Joseph to provide training to store employees on selling less-toxic products. Since FY 07-08, SCVURPPP has also used the services of Ms. Joseph to work with two Santa Clara Valley stores to increase shelf space dedicated to less-toxic products.

This report summarizes the work done by the consultant in FY 09-10 to complete these projects.

Store Employee Trainings: 99 employees trained, 13 trainings conducted

The 1 to 2-hour employee trainings cover topics like IPM, current pest problems in Santa Clara County, information on available less-toxic products for dealing with them, water quality problems due to pesticides with a focus on pyrethroids, problems with nutrient runoff of chemical fertilizers, how to read a pesticide label, beneficial insects etc. Additional information has been included upon request of the store staff i.e. light brown apple moth, Colony Collapse Disorder, and giant whitefly, citrus leaf miner, and spider mites. The consultant prepared the training material and provided it to SCVURPPP staff for photocopying and organizing into folders.

The year was another very challenging year economically but the stores value the training so much, that they made additional efforts to make time for the training before, during and after hours. For trainings conducted during business hours the consultant trained staff in shifts to accommodate the store's needs. Many stores such as Home Depot and OSH experienced deep cuts in employee hours and this made training part-time staff difficult. These stores spent their staff-hours early in the spring and had to adjust later in the quarter to remain profitable. The consultant has never seen so few nursery and garden staff; sometimes only two were on duty for a large department.

Overall, there was more interest in learning details of how pesticides effect the environment and how they can better recommend non-toxic and less-toxic alternatives. The consultant spent time focusing on pest prevention strategies and engaging the staff in troubleshooting pest problems before recommending pesticides.

The consultant also spent time discussing the issues with pesticides that can contribute to Colony Collapse Disorder and pests like whitefly and spider mites that can be onsite as a result of certain pesticides that knock out the predator populations for these pests.

There were also additional efforts by pesticide companies to ramp up their trainings this year to garner their share of the market in a very difficult economic climate. The consultant has never seen the pesticide companies as vigilant for the business. Some had paid staff stocking stores and working the aisles on weekends at OSH and Home Depot.

The following trainings were conducted in FY 09-10:

- **Los Altos Garden Supply, Los Altos, 12/19/10 –** Trained 6 employees. The staff was very shy at first but seemed to be interested to learn more about beneficial insects. The consultant focused on using pesticides that would have the least impact on the environment.

- **Home Depot, Capitol Expressway, San Jose, 1/11/10 –** Trained 9 employees. Excellent response. New manager of garden requested a larger Good Bug Bad Bug chart, so the consultant had an 8.5x 11 inch one made up for him to display in the garden section indoors. Manager Chris was very cooperative and when the consultant saw him at another store later he said the staff had great feedback for him.
- **Home Depot, Sunnyvale, 1/13/10 –** Trained 10 employees. Great response. Miranda Melen (SCVURPPP staff) and Jackie Besoyan (Sunnyvale) attended the store training. Helen (Store Training Coordinator) really had her act together and this store will be a shining star in the Home Depots.
- **OSH, Alum Rock, San Jose, 1/20/10 –** Trained 5 employees. Very good support here for training. One of the assistant managers is a former organic farmer and he joined the training. The consultant was very impressed with the questions and interest of those in the training.
- **Yamagami's Nursery, Cupertino, 3/3/10 –** Trained 9 employees. The staff had many questions about the systemic pesticides on the market and the effect on edible crops. This lead to a very lively discussion and it became clear to me that the stores needs 3rd party input on what the pesticide industry is promoting as "safe".
- **Los Altos Nursery, Los Altos, 4/5/10 –** Trained 6 employees. It was a great opportunity to jumpstart interest in the program here. Previously, this nursery was not fully involved in the OWOW program. The owners felt that they did not have floor space for a literature rack and were only providing a few fact sheets on their outside bulletin board for customers to view. Due to limited shelf space, they were not willing to have shelf talkers either. Dean and Darrell (the owners) both attended the training and were very happy to participate in a lively discussion about the hype from the pesticide companies that their systemic products are safe to use on food. They also agreed to allow the fact sheet rack out on the floor and were happy to have the consultant put up shelf talkers.
- **Home Depot, Hillsdale, San Jose, 4/6/10 –** Trained 4 employees. The training was scheduled after two store visits and one cancelled training. The staff was very interested and had many questions about less toxic products.
- **Home Depot, Monterey Road, San Jose, 4/13/10 –** Trained 16 employees. Great turn out and good support at the store. They had folks come in 2 separate shifts so the floor could be staffed. Employees were very interested and actually wanted a longer training.
- **Home Depot, Story Road, San Jose, 5/4/10 –** Trained 11 employees. This store was very challenging to commit to a time for training and the consultant ended up having to reschedule after having arrived with folders in hand the week prior. The staff was very enthusiastic and wanted more of the garden folks there but this is what they were able to schedule. This group said their customers know the least about the environment and really could use some help and support beyond the training.
- **Home Depot, Blossom Hill, San Jose, 5/4/10 –** Trained 4 employees. This was one of the more challenging stores to schedule. The consultant had 3 cancellations and two additional store visits to get the final one scheduled. The trainees were very enthusiastic but they commented that more of the co-workers would have benefited being a part of the training.
- **OSH, Cottle Road, San Jose, 5/19/10 –** Trained 3 employees. Very enthusiastic but because of cut in staff hours the number of attendees was small. The consultant was glad to see a trainee from 8 years ago that is now the department manager. He was very complimentary of the training and suggested that the consultant try to get an opportunity to train at the regional trainings that OSH has for garden staff. The consultant has contacted the OSH coordinator for the trainings.

- **SummerWinds, Palo Alto, 6/17/10 –** Trained 5 employees. Bob Voshell, the store manager, joined the training. The consultant concentrated on a new pest; spotted winged fruit fly that attacks unripe soft skinned fruits like cherries, blueberries, and strawberries, and the citrus leaf miner in addition to the pending asian citrus psyllid. Bob was very complimentary of the training.
- **Almaden Valley Nursery, San Jose**, **6/23/10** – Trained 11 employees. The owner is very dedicated to the trainings and has all employees including cashiers attend each year, even on their day off. The nursery staff is very sophisticated and they always have questions about pesticides and their toxicity to the environment. The consultant covered the new invasive pests and reminders about reading the pesticide label.

Increasing Shelf Space for Less Toxic Products

The objective of this project was to work with pesticide buyers and distributors at selected stores to encourage them to buy more less-toxic products. The following stores participated in this project: Los Altos Garden Supply and SummerWinds in Palo Alto.

Los Altos Garden Supply, Los Altos
This store was particularly challenging as they did not have a receptive attitude toward the program. Although they had shelf talkers they resisted putting the literature rack up in a visible area. The rack was often buried behind stacks of equipment.

The main goal was to bring them back into the fold. The consultant contacted one of their distributors Larry Byers and told him about the challenges with the store. Larry offered to have the consultant accompany him on his regular call schedule and he would introduce the consultant to the manager and the buyer. They were slightly receptive when the consultant offered to do training for the staff. A training was scheduled for December 19th and the consultant trained 6 employees. They were all very interested in learning about the beneficial insects for the garden. Following the success of the training, the consultant implemented the following activities at this store:

- The consultant updated shelf talkers and requested that the literature racks (one for Spanish fact sheets and one for Enlishg) be placed in the pesticide section rather than behind a garage door. George said that would be fine to move the racks to a more visible spot.
- On February 13th the consultant did an outreach event for customers which ended up being more of a tabling event handing out Sluggo samples and free white fly traps. The consultant contacted about 30 customers and met many Spanish speaking families who were delighted and wanted to know if the event would be held again.
- In May, the consultant held a special class on beneficial insects and less-toxic products for members of the Bay Area Gardeners Association (BAGA) at the store. The consultant contacted the head of BAGA and he spread the word to BAGA members. A small group attended the talk and received free whitefly traps, good bug bad bug charts, and samples of organic fertilizer and Sluggo. Juan seemed extremely pleased as the attendees also purchased products from the store. This has increased the sales of their less toxic products

SummerWinds Nursery, Palo Alto.
The consultant was not included in the SummerWinds kickoff meetings this year because they went to a different format for their annual meeting that would not allow time this year. Usually the consultant is able to contact 60 of their employees at this meeting. Hopefully next season the consultant will be able to join.

The consultant asked the general managers at SummerWinds which nursery they would like the consultant to work with and they chose SummerWinds in Palo Alto.

The consultant worked with the garden department manager Warren and focused on beneficial insects and the plants that attract them. The consultant worked several days this spring with Warren in the pesticide section with customers. Warren said that his store was the top store in SummerWinds for lady bug sales. The consultant also kept the shelf talkers refreshed and made new laminated photos of the beneficial insects for Warren to post in the pesticide section. He asks folks first if they want to go organic and if not he shows them other options. The consultant worked with Warren on four separate occasions making a tape of one of his "Mr. Organic" talks. The consultant worked with Warren and his customers on February 13th in the afternoon after the Los Altos Garden Supply event, April 5th, April 18th, and May 15th.

Warren is a great sales person and one that is good to have in the less toxic camp. The consultant has sent photos to Program staff for these events.

Evaluation of Effectiveness

The following factors indicate the success of these projects:

- The success of the program is the frequent contact and trainings. The stores have appreciated the trainings and additional attention. Due to the success of the training, Los Altos Nursery is now fully supporting the OWOW Program.

- SummerWinds in Palo Alto: More beneficial insect sales and exposure for good bug identification in the pesticide section.

- Los Altos Garden Supply: Improved relationship with the store management and increased visibility of the OWOW program. A big success was scheduling the customer outreach event. A distributor representative from a pesticide company called the consultant to inquire about the customer outreach event. The representative said the company had tried to do outreach at the store but had been unsuccessful. The customer outreach event also highlighted the OWOW Program as an information resource to the Spanish speaking gardeners. This benefited the store's business as customers now come to the store looking for less-toxic products and less-toxic pest management information. The store now sees the value in OWOW.

Conclusions and Recommendations

The consultant sees the increased interest in the trainings and IPM due to the wave of interest in environmentally friendly practices. Many of the stores want to be more environmentally friendly but need guidance when it comes to filtering information they receive from pesticide companies and have come to depend on unbiased feedback they get through OWOW. This became ever more apparent with the pesticide companies heavily soliciting the stores for sales because of the poor economy. They offer a lot of money to advertise and display the more toxic materials. This made this year particularly challenging for the consultant.

The 10 Most Wanted Bug Brochures are important for the stores to have. These have become the single most important tool for staff and customers to quickly identify beneficial insects in their adult and larval stages and list the flowers they are attracted to. With the popularity of this brochure it makes it easy for the stores and the public to identify insects they may be spraying inadvertently and also makes an easy transition to talking about not using pesticides that leave a residue for beneficial insects. The consultant recommends the purchase of at least 600 of these brochures next season.

List of Stores in the IPM Store Partnership Program and Training Dates										
City	Store Name	Address	FY02-03 Training	FY03-04 Training	FY04-05 Training	FY05-06 Training	FY06-07 Training	FY07-08 Training	FY08-09 Training	FY09-10 Training
Campbell										
1	Home Depot	480 E Hamilton Ave								
2	SummerWinds Nursery	2460 S Winchester Blvd	4/28/03	2/18/04	2/2/05	1/31/06	6/5/07	2/5/08	2/3/09, 6/1/09	
Cupertino										
3	SummerWinds Nursery	1491 S De Anza Blvd	9/4/03	2/18/04	2/2/05	1/31/06	6/5/07	4/23/08	2/3/09, 5/20/09	
4	Yamagami's Nursery	1361 S De Anza Blvd	3/20/03	6/2/04		2/1/06	5/2/07	3/5/08	2/10/09	3/2/10
Los Altos										
5	Los Altos Garden Supply	4730 El Camino Real								12/19/09
6	Los Altos Nursery	245 Hawthorne Ave								4/5/10
7	Walgreens	1150 Riverside Drive								
Los Gatos										
8	Ace Los Gatos Hardware	15300 Los Gatos Blvd								
Milpitas										
9	Home Depot	1177 Great Mall Drive								
10	Orchard Supply Hardware	125 N Milpitas Blvd			5/11/06	5/11/06				
Mountain View										
11	Blossom True Value Hardware	1297 W El Camino Real								
12	Orchard Supply Hardware	2555 Charleston Rd	4/9/03							
13	SummerWinds Nursery	805 Yuba Dr	2/27/03	2/19/04	7/20/05	1/31/06	5/22/07	2/6/08	2/3/09	
Palo Alto										
14	Palo Alto Ace Hardware	875 Alma Street			2/3/05	5/4/06	1/30/07	5/21/08	5/26/09	

City	Store Name	Address	FY02-03 Training	FY03-04 Training	FY04-05 Training	FY05-06 Training	FY06-07 Training	FY07-08 Training	FY08-09 Training	FY09-10 Training
15	Peninsula Hardware	2676 Middlefield Rd	4/29/03							
16	Common Ground Organic Garden Supply	559 College Ave								
17	SummerWinds Nursery	725 San Antonio Rd		5/23/04	2/2/05	2/1/06	6/27/07	4/23/08	2/4/09, 6/1/09	6/17/10
Santa Clara										
18	Home Depot	2435 Lafayette St								
19	Orchard Supply Hardware	3615 El Camino Real				5/25/06				
San Jose										
20	Ace Hardware	2253 Lincoln Ave						5/21/08	5/21/09	
21	Almaden Valley Nursery	15800 Almaden Exwy	4/23/03	5/19/04		5/2/06	5/16/07	3/20/08	4/8/09	6/23/10
22	Home Depot	2181 Monterey Road								4/13/10
23	Home Depot	2855 Story Road								5/4/10
24	Home Depot	635 W Capitol Expy								1/11/10
25	Home Depot	1855 Hillsdale Ave								4/6/10
26	Home Depot	975 De Anza Blvd								
27	Home Depot	920 Blossom Hill Rd								5/12/10
28	Orchard Supply Hardware	720 W San Carlos St	3/6/03							
29	Orchard Supply Hardware	3000 Alum Rock Ave	3/5/03			5/5/06				1/20/10
30	Orchard Supply Hardware	1130 Branham Ln	3/6/03				5/9/07			
31	Orchard Supply Hardware	1751 E Capitol Expwy	3/13/03							
32	Orchard Supply Hardware	5651 Cottle Rd	5/1/03							5/19/10
33	Orchard Supply Hardware	5365 Prospect Rd	3/6/03					4/30/08		

City	Store Name	Address	FY02-03 Training	FY03-04 Training	FY04-05 Training	FY05-06 Training	FY06-07 Training	FY07-08 Training	FY08-09 Training	FY09-10 Training
34	Payless Nursery	2927 S King Rd				5/9/06	3/14/07			
35	SummerWinds Nursery	4606 Almaden Expwy	4/23/03	7/11/04	2/2/2005	2/1/06	6/5/07	4/23/08	2/4/09, 6/2/09	
Sunnyvale										
36	Home Depot	680 Kifer Rd								1/13/10
37	Orchard Supply Hardware	777 Sunnyvale-Saratoga Rd	5/28/03							
38	SummerWinds Nursery	861 E. El Camino Real		7/7/04	2/2/05	2/1/06	5/22/07	2/5/08	2/4/09, 6/2/09	

SCVURPPP PESTICIDE USER OUTREACH
FY 09-10 Summary of Store Employee (not including Home Depot Employees) Training Evaluations

Number of Attendees: 52
Number of Evaluations Submitted: 39

	Agree	Neutral	Disagree	Comments
The instruction was well organized and interesting.	39	0	0	• *Already using/promoting organics* • *Flowed nicely*
The information changed my attitude about pesticides.	23	13	2	• *Learned new ways to identify problems* • *Already use/sell organic/natural solutions* • *Views not changed, already agree*
The information was useful.	39	0	0	• *I have a degree in horticulture & I still learned a lot.* • *Nice handouts – useful to share*
The information will help me sell less-toxic products.	39	0	0	
The instructor was responsive to questions.	37	1	0	
The level of detail was appropriate.	36	2	1	• *More detail would be good*
Visual aids were effective.	35	3	1	• *Easy to understand*
Written materials were effective.	35	4	0	
I would recommend the training to co-workers.	36	3	0	

What part of the training was most useful?

- *Visual slide show*
- *What was bad about synthetics*
- *Citrus minor information*
- *Pictures of insects*
- *The danger of slug bait to dogs*
- *Bug chars for me, questions answered*
- *Time and proper application of chemicals*
- *Pest ID and controls*
- *Slides and literature*
- *Visual aids – seeing the useful products*
- *Learning both chemical and organic (bug) methods*
- *New pest concerns and identification*
- *Using Neem at dusk*

What part of the training was least useful?

- *Review of old material*

When this training is held again, what changes do you suggest?

- *Different visual aids would be more helpful, larger pictures of bugs already on chart not so helpful*
- *Add soil and fertilizer (organic)*
- *Great specific information on organics*
- *More hands on learning*
- *More information cards to hand out to interested customers*
- *More information on pests other than citrus*
- *Continuing new information*

How much of today's information was new to you? All: 13 Some: 25 None: 2
Comments:

- *New bug information was very helpful*
- *Presenter knew a lot of information about plants and insects*
- *Spraying all chemicals at dusk*
- *Great to have updates*

For store managers - Will you continue to provide this training to new employees yourself?
Yes: 5 No: 0 I will use a trainer: 2

SCVURPPP PESTICIDE USER OUTREACH
FY 09-10 Summary of Home Depot Employee Training Evaluations

Number of Attendees: 47
Number of Evaluations Submitted: 39

	Agree	Neutral	Disagree	Comments
The instruction was well organized and interesting.	38	1	0	• *Already using organics* • *Good presentation* • *Kept me interested* • *Excellent*
The information changed my attitude about pesticides.	39	0	0	• *Had not thought about good and bad insects* • *Very informative* • *Did not know there were so many varieties of pesticides* • *I used to think all products had bad poison* • *I will definitely recommend less toxic products now!* • *Already knew about information*
The information was useful.	37	1	0	• *This information will be useful in the future* • *I learned a lot* • *Good detail*
The information will help me sell less-toxic products.	37	1	0	• *Very informative, but I'm not in the garden department* • *Also I can recommend* • *Pet-friendly*
The instructor was responsive to questions.	39	0	0	• *Very helpful/ good info*
The level of detail was appropriate.	39	0	0	
Visual aids were effective.	37	2	0	
Written materials were effective.	38	1	0	
I would recommend the training to co-workers.	39	0	0	• *I would recommend this to all*

What part of the training was most useful?

- The visual aids were very helpful
- Good bugs & bad bugs
- How to recommend eco-friendly products to our customers & be safe to our water & environment & keep animals & kids safe
- Pointing out various products
- Fleas, fruits, and roses
- True life examples
- Slides and handouts

- Bug identification
- Information on reading labels
- Pictures of the insects
- Learned the basics about correctly using pruning and fertilizer to prevent infestations
- Types of bugs that help gardens
- Common pests and useful bugs and how to manage
- Finding out that pesticides can kill pets
- Tips for snails

What part of the training was least useful?

- More time reserved to make the lesson less rushed
- It was a lot of information to take in
- We do not need to see the pictures of all the bugs – could be condensed

When this training is held again, what changes do you suggest?

- Maybe have some real life insects to show for hands on
- The presentation was very well put together, next time talk more about the products
- Have this class taught to garden associates
- Mention products that Home Depot sells and pictures of those products
- Please extend the amount of time and go more in depth
- More Home Depot product detail and how to apply
- Make the training two hours long – it wasn't long enough
- Examples of diseases that attack plants
- Do not give too much detail on what good bugs and bad bugs do
- Have more of our employees involved - so they can hear the info and be able to sell products to customers
- Smaller field guide that we could carry with us
- Go through all the information that is in the folder as you talk about each subject
- Passing around chemical containers/Home Depot products

How much of today's information was new to you? All: 17 Some: 18 None: 1
Comments:

- I learned more about bugs and what kills them
- Very helpful, really liked visual aids
- I knew nothing before hand and now I am confident in selling our products
- I had been learning about organics anyway, so the training was extremely helpful
- Really helpful, thanks for your time – it was all new to me!
- Nicely presented

For store managers - Will you continue to provide this training to new employees yourself?
Yes: 7 No: 0 I will use a trainer: 2

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 9-2

FY 09-10 Green Gardener Training Program

- Santa Clara Valley Green Gardener Training Program FY 09-10 Activities – Final Report
- List of Green Gardeners
- Fall 2009 Evaluations Summary – English
- Fall 2009 Evaluations Summary – Spanish
- Fall 2009 Basic Training Class Flyer – English
- Fall 2009 Basic Training Class Flyer – Spanish
- Spring 2010 Re-Certification Class Flyer – English
- Spring 2010 Re-Certification Class Flyer – Spanish
- Spring 2010 Re-Certification Reminder Postcard

Santa Clara Valley *Green Gardener* Training Program

FY 09-10 Activities

Background

In FY 07-08, the Program piloted the first Santa Clara Valley *Green Gardener* training which is an educational initiative that brings quality training to professional landscapers, gardeners and landscape maintenance workers on how to "garden green." Each training session consists of ten 2-hour classes, held once a week for ten weeks. The training has been conducted in collaboration with the Metropolitan Adult Education Program and the Master Gardeners of Santa Clara County.

On completion of the training, graduates are provided a certificate of completion and a *Green Gardener* card.

To maintain their status as *Green Gardeners*, and to renew the *Green Gardener* card, landscape maintenance professionals are required to fulfill one of the following Continuing Education requirements:

- Take two hours of additional classes that are related to at least one of the topics covered in the class. OR
- Fill out and submit the *Green Gardener* Self Assessment form. OR
- Have three customers fill out and submit the *Green Gardener* Customer Evaluation Form.

FY 09-10 Activities

The Program conducted two training sessions in FY 09-10, including one session conducted entirely in Spanish. The training session in English was on Tuesdays, September 22 - December 1, 2009 and the session in Spanish was on Wednesdays, September 23 – December 2, 2009. The Program provided funds toward student fees, guest speaker fees, Spanish interpreter fees, and supplies (soil probes, magnifying lenses, and "Good Bug Bad Bug" Charts).

In addition, the Program held four two-hour sustainable landscaping classes to offer *Green Gardeners* an opportunity to re-certify. Other landscape professionals were also allowed to attend. Class details are below:

- Smart Irrigation Controllers (Spanish class) - Thursday March 4, 2010, 4-6 PM
- Smart Irrigation Controllers (English class) - Saturday, March 6, 2010, 10 AM - Noon
- Maintenance of California Native Plants (English class) - Thursday, March 11, 2010, 4-6 PM
- Controlling Common Garden Pests Using IPM (Spanish class) - Saturday, March 13, 2010,10 AM - Noon

The Program conducted outreach to inform local landscape maintenance businesses about the training. Outreach to residents was also done to inform them about the availability of trained *Green Gardeners*. Outreach efforts included the following:

- Mailing letters and flyers to local landscaping businesses;
- Advertising on English and Spanish radio stations;

- Posting training announcements on the Watershed Watch website, Facebook, and Twitter;
- Distributing flyers at outreach events; and
- Posting the list of trained *Green Gardeners* on the Watershed Watch website;

Evaluation of Effectiveness

In FY 09-10, 22 individuals completed the *Green Gardener* training; 12 took the training in English and 10 in Spanish. In addition, 30 individuals, including 18 *Green Gardeners*, attended the re-certification classes.

A summary of the evaluations from the *Green Gardener* training is included in Appendix 9-2. It indicates that attendees found the class very useful and will be making changes to their landscape management practices based on what they learned at the trainings. Attendees were required to take a final test to receive the certificate of completion. This ensured that they understood the curriculum and will be able to implement the practices at their client locations.

In FY 09-10, 25 *Green Gardeners* renewed their *Green Gardener* card meeting the Continuing Education Requirements. Of these, 18 met the requirement by attending the Program's re-certification classes. Due to the success of these re-certification classes, the Program may offer them again next year.

Currently, there are 46 *Green Gardeners* (31 are professional landscape maintenance contractors and 15 are individuals that do not provide professional services) on the Santa Clara Valley *Green Gardener* list. This list is available online at http://www.mywatershedwatch.org/findgardener.html.

Find a *Green Gardener*

Is your gardener a ***Green Gardener***? Hire a Santa Clara Valley *Green Gardene*r to maintain your garden using sustainable landscape maintenance practices.

Santa Clara *Green Gardeners* have received training to:

- Use resources wisely, conserve water, protect the soil, and reduce waste.
- Improve the health, appearance and value of landscapes.
- Reduce urban runoff and stormwater pollution from landscape maintenance activities.

These Santa Clara Valley *Green Gardeners* provide professional landscape maintenance and/or design services throughout Santa Clara County.

**Green Gardener* since April 2008

***Green Gardener* Name**	**Business Name**	**Phone Number**
Erik Aceves	Common Ground Landscape	408-210-7174
Alfonso Aguayo	Common Ground Landscape	408-422-7261
Julio Aguayo	Common Ground Landscape	408-210-7174
Ruben Aguayo	Common Ground Landscape	408-210-7174
Jose Berumen	F & H Landscaping	408-201-2984
Will Castillon	Central Coast Wilds	831-750-2361
Jaime Caudillo	Jaime Caudillo Gardening Services	650-630-3164
Didier Ceja	Dinmore Landscape Company	408-970-0593
Nate Crosby	Crosby Landscaping	408-417-5137
Leopoldo Cuevas	Central Coast Wilds	831-750-2361
Larry Edgington	Horizon	408-394-9313
Filiberto Fonseca*	Allied Landscape Services	408-310-8476
Israel Fonseca*	F & H Landscaping & Maintenance	408-201-2984
Vidal Fonseca*	Allied Landscape Services	408-310-8477
Ulan Garduno	Cal Earthcare Landscaping, Inc.	408-871-2792
Juan Guerra	Juan's Landscaping Service	650-208-0501

Green Gardener Name	Business Name	Phone Number
Heidi Johnson*	HKJohnson & Associates, Landscape Design & Consultation	408-863-0236
Jason Karklins	Jason's Maintenance Service	408-340-3624
Dominique Lala	Dominique Lala	408-279-1993
Peggy Lin Hung*	Peggy Lin Hung Landscape Design	650-949-3639
Mark McCabe*	Mark R. McCabe Landscape Contractor	408-978-2965
Lauro Mendez	Lauro's Gardening	408-218-6045
Rigo Mendoza	Valley Greenscapes	408-839-0940
Erik Morales	JPA Landscaping & Construction	925-960-9602
Edmund Morrissey*	JPA Landscape & Construction, Inc.	925-960-9602
Antonio Ocegueda*	Greener Maintenance Service	408-729-6097
John Punches	JPA Landscaping & Construction	925-960-9602
Maryanne Quincy*	Q-Gardens Landscape Design	408-739-5493
Shesta Ross	Natural Bridges Landscaping	408-206-2606
Edward Sanchez*	ESD Landscape	408-377-6977
Samuel Toscano	Common Ground Landscape	408-210-7174
Juan Vivanco	Juviva Landscape Service, Inc.	408-375-2705

The following individuals have taken our *Green Gardener* training but do not provide professional services.

Green Gardener Graduates	
Amador Castillo	Ignacio Martinez
Mary Chicca	Anthony Morse
Hilleguus Faber*	Baltazar Rojas
Ana Flores	Liborio Sánchez López
Salvador Frutos	Denise Smith
Brian Higgins	Andrea Vedanayagam
Osbaldo Jimenéz	Putu Winata
Jesus Macias	

Congratulations Graduates!

Class Evaluation - Final (12 Evaluations Received)

1. How did you learn about this class?

Flyers	2	Newspapers		Radio		Friends	
Article in CLCA	3	MAEP Class Mailer	4	Clients		No Answer	
Supervisor/Boss	5	Other	CCOC Pamphlet				

2. Which cities do you have clients located in or have worked on jobs there within the past year?

Campbell	8	Cupertino	6	Los Altos	5	Los Altos Hills	5
Milpitas	3	Monte Sereno	6	Mountain View	6	Palo Alto	5
Saratoga	6	Sunnyvale	9	Los Gatos	8	San Jose	9
Unincorporated Santa Clara County			6	No Answer		Santa Clara	8
Other							

3. Were the following topics useful?

Soils	Yes	12	Somewhat	No	No Answer
Comments on Soils		Soil probe helpful			
Pruning	Yes	12	Somewhat	No	No Answer
Comments on Pruning					
Right Plant, Right Place	Yes	12	Somewhat	No	No Answer
Comments on Right Plant, Right Place					
Integrated Pest Mgmt.	Yes	12	Somewhat	No	No Answer
Comments on Integrated Pest Mgmt.		Appreciate this one			
Compost / Mulches	Yes	12	Somewhat	No	No Answer
Comments on Compost / Mulches		Great field trip.			
Fertilizers	Yes		Somewhat	No	No Answer
Comments on Fertilizers		12			
Irrigation (1, 2 & 3)	Yes	12	Somewhat	No	No Answer
Comments on Irrigation (1, 2 & 3)					
Air Quality	Yes	12	Somewhat	No	No Answer
Comments on Air Quality					

Other topics that you would have liked to learn?
Programming "Smart" controllers, specialized pruning techniques for plant varieties. Using tools properly. Advanced classes.

4. Will you be changing any of your landscape management practices based on what you have learned in class?

Yes	11	No	No Answer	1

5. Please provide one or two examples of a practice that you will be changing:
Better pruning practices, water management for clients through frequent and better knowledge of irrigation scheduling
Pruning, irrigation techniques, pestidide management
Irrigation
I will use less polluting tools and will consider mulch and compost before using pesticides
Water lawn according to CIMI chart and Right Plant, Right Place
Watering schedule will be better managed
Offering clients environmentally friendly machinery
Fertilizers and progamming irrigation
Fertilizera and IPM
Irrigtaion techniques, pruning, fertilizers

6. What benefits from this program are important to you? Valuable?

Information & Training	Yes	12	Somewhat	No	No Answer
Comments on Info & Training					
Comparing ideas with others	Yes		Somewhat	No	No Answer

Comments on Comparing ideas w/ others		12							
Meeting with experts and guest lecturers	Yes	12	Somewhat		No		No Answer		
Comments on Meeting w/ Experts, etc...									
Getting on the certification list for Green Gardeners	Yes	11	Somewhat	1	No		No Answer		
	Eventually								
Comments on Certification List									
Other?									
7. Class slides and information: Valuable?									
Were the class slides shown in class useful?	Yes	10	Somewhat	2	No		No Answer		
Comments on class slides									
	Some slides were obscure								
Were the slide copies in your notebooks useful?	Yes	10	Somewhat	2	No		No Answer		
Comments on handbook slides									
	Difficult to see the small print								
	Small Print								
Were the other handouts provided useful?	Yes	11	Somewhat	1	No		No Answer		
Comments on handouts									
Please tell us what we could do better:									
	More hands on material & equipment								
	Have an advanced class								
	Great								
8. Would you recommend taking this Green Gardner class to a friend?			Yes	12	No		No Answer		
9. Would you be interested in taking an advanced Green Gardener course?			Yes	12	No		No Answer		
			Maybe						
10. Was the location convenient for you at Metro Ed?			Yes	10	No	2	No Answer		
			Sort Of						
11. Were the class times convenient for you?			Yes	12	No	2	No Answer		
			In Between Y & N						
12. Is there a time of day that would be more convenient for the class?			After 6 p.m.		No Answer	6	3 p.m.		
			5:30 p.m.		Evening		5 p.m.		
			8-9 AM	1	Okay		5PM - 7 PM		1
13. Do you work for:	Yourself	6	A Company	6	An Agency		No Answer		
	Transitioning Into								
14. How many different landscape maintenance clients do you have?			Zero		One	1	Two		
	Four		Five	2	Six		Twelve		
	Twenty	2	Thirty		70-100	3		180	
	Unknown		Mine		Various				
	None	1	No Answer						

15. Please tell us about how much landscape maintenance training you have had before taking this class:

None	4	Some Classes	6	A degree in horticulture or other program	1
No Answer	1				

16. How much would you be willing to pay for this class?

$40	1	$80	4	$120	7	Depends	No Answer

Comments

17. In which language do you prefer to receive training?

English	12	Spanish	2	Vietnamese	0	Other	Italian
No Answer							

18. Please tell us any other suggestions you may have to make the Green Gardner classes better?

A field trip to a sustainable landscaping company or a nursery

Concentrate more on organic fertilizers, not petroleum based . Discuss harm petroleum based fertilizers do. Express the damange that improper pruning and laying down plastic as a weed surpressor do

Same place, same day each time as I couldn't make it to the SMaRT Station

Thank you

Class Evaluation - Final (Received 10 Evaluations)

1. How did you learn about this class?

Flyers	Newspapers	Radio	5	Friends 1
Article in CLCA	MAEP Class Mailer	Clients		No Answer
Supervisor/Boss	2 Other Internet-2			

2. Which cities do you have clients located in or have worked on jobs there within the past year?

Campbell	2	Cupertino	4	Los Altos	4	Los Altos Hills	2
Milpitas	2	Monte Sereno	2	Mountain View	3	Palo Alto	4
Saratoga	3	Sunnyvale	2	Los Gatos	5	San Jose	6
Unincorporated Santa Clara County		1		No Answer	1	Santa Clara	2
Other	Fremont						
En ninguna (sin experiencia en el ramo)							

3. Were the following topics useful?

Soils	Yes	9	Somewhat	No	1	No Answer
Comments on Soils						
Pruning	Yes	10	Somewhat	No		No Answer
Comments on Pruning						
Right Plant, Right Place	Yes	10	Somewhat	No		No Answer
Comments on Right Plant, Right Place						
Integrated Pest Mgmt.	Yes		Somewhat	No		No Answer
Comments on Integrated Pest Mgmt.						
Compost / Mulches	Yes	10	Somewhat	No		No Answer
Comments on Compost / Mulches						
Fertilizers	Yes	10	Somewhat	No		No Answer
Comments on Fertilizers						
Irrigation (1, 2 & 3)	Yes	10	Somewhat	No		No Answer
Comments on Irrigation (1, 2 & 3)						
Air Quality	Yes	9	Somewhat	No	1	No Answer
Comments on Air Quality						

Other topics that you would have liked to learn?
Creo qe todos los temes son interestantes. Lo que yo sugeriria es una mayor practica de la tectia p/persones s/experiencia
Si como aser un presupuesto correcto
Compost, Ingertos, Flores

4. Will you be changing any of your landscape management practices based on what you have learned in class?

Yes 8 No No Answer 2

Si yo podiera, procticaria paisajes con plumatos que no sequieran demasiodo agua y supliendo en algunos cosos, el pasto, por una carpeta de materieles petseos de pequena demsidad

5. Please provide one or two examples of a practice that you will be changing:
El racionemeinto de agua y lo no contaminacion por queimicos

La poda natural, el control de irrigacion
Utilizar menos maquinas
A podar, regarr y plantar
Usar maquinas que contamina menos
Poda natural, planta correcta en el lugar correcto

6. What benefits from this program are important to you? Valuable?

Information & Training	Yes	7	Somewhat	No	No Answer	3
Comments on Info & Training						
Comparing ideas with others	Yes	8	Somewhat	No	No Answer	2
Comments on Comparing ideas w/ others						
Meeting with experts and guest lecturers	Yes	8	Somewhat	No	No Answer	2
Comments on Meeting w/ Experts, etc...						
Getting on the certification list for Green Gardeners	Yes Eventually	9	Somewhat	No	No Answer	1
Comments on Certification List						
Other?	Como cobror por un trabajo Particpar en grupo					

7. Class slides and information: Valuable?

Were the class slides shown in class useful?	Yes	8	Somewhat	No	No Answer	2
Comments on class slides						
Were the slide copies in your notebooks useful?	Yes	8	Somewhat	No	No Answer	2
Comments on handbook slides						
Were the other handouts provided useful?	Yes	8	Somewhat	No	No Answer	2
Comments on handouts						

Please tell us what we could do better:

8. Would you recommend taking this Green Gardner class to a friend?	Yes	9	No	No Answer	1

9. Would you be interested in taking an advanced Green Gardener course?

Yes	9	No		No Answer	1
Maybe					

10. Was the location convenient for you at Metro Ed?

Yes	9	No		No Answer	1
Sort Of					

11. Were the class times convenient for you?

Yes	8	No	1	No Answer	1
In Between Y & N					

12. Is there a time of day that would be more convenient for the class?

After 6 p.m.	2	No Answer	4	3 p.m.	
5:30 p.m.		Evening		5 p.m.	4
A.M.		Okay			

13. Do you work for:

Yourself	1	A Company	4	An Agency		No Answer	5
Transitioning Into							

14. How many different landscape maintenance clients do you have?

		Zero		One		Two	
Four		Five		Six	2	Twelve	
Twenty		Thirty					500
Unknown		Nine	1	Many	1		
N/A		No Answer	5	None	1		

15. Please tell us about how much landscape maintenance training you have had before taking this class:

None	7	Some Classes	A degree in horticulture or other program	
No Answer	3			

16. How much would you be willing to pay for this class?

$40	2	$80	3	$120	3
Depends		No Answer	2		

Comments

17. In which language do you prefer to receive training?

English		Spanish	9	Vietnamese	0	Other	0
No Answer	1						

18. Please tell us any other suggestions you may have to make the Green Gardner classes better?

Tiempo Clase: 50% de tiempo teorin, 50% de tiempo practica
Mas informacion y annuncios como en la radio o periodicos - publicidad
Tener mas informacion sobre las temas a tratar
Con mas tutores en Espanol

Durando poco mas las clases
Un poco mas practica or tenicas

Santa Clara Valley Green Gardener

Announcing:

Green Gardener Training Classes - Fall 2009

Two Santa Clara Valley Green Gardener Classes will be held by the Community Interest Program of the Metropolitan Adult Education District located at the Erikson Adult Education Center, 4849 Pearl Ave, San Jose, CA 95136 starting in September.
Learn ways to conserve water, protect the soil, reduce the use of pesticides, create a healthier work environment, and expand your business prospects.

➡ Tuesdays, September 23 - December 2, 2009, 4:00 PM - 6:00 PM (Spanish)

➡ Wednesdays, September 24 - December 3, 2009, 4:00 PM - 6:00 PM (English)

Class registration fee is $120. (Scholarships for up to $80 are available. Let Metro Ed staff know if you are interested in applying for one when you sign up.)

Class written materials are available in Spanish or English

Professional gardeners and landscape maintenance professionals who attend 80% of the classes and successfully complete an exam will receive a certificate of completion and their Santa Clara Valley Green Gardener Card.

Call the MAEP Administrative Center at **(408)723-6450** to sign up for a class. For more information on the Green Gardener program, visit

www.MyWatershedWatch.org

As successful Santa Clara Valley Green Gardener Graduates, please tell your friends, family, or co-workers who might be interested about this upcoming training opportunity.

Master Gardeners of Santa Clara County

MetroED

Metropolican Education District
Metrolpolitan Adult Education Program

Santa Clara Valley Urban Runoff Pollution Prevention Program

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

Anuncio:

Clases de Jardinería Verde - Otoño 2009

Dos clases de Jardinería Verde de Valle de Santa Clara iniciarán en septiembre. Serán ofrecidos por el Programa de Interés Comunitario del Distrito Metropolitano de Educación de Adultos (MAEP), localizado en el Erikson Adult Education Center, 4849 Pearl Ave, San José, CA 95136

Aprenda métodos para preservar el auga, proteger los suelos, disminuir el uso de pesticidas, crear un ambiente laboral más saludable y ampliar su clientela.

- Los martes 23 de septiembre y 2 de diciembre de 2009, de 4:00 PM a 6:00 PM (en español)
- Los miércoles 24 de septiembre y 3 de diciembre de 2009, de 4:00 PM a 6:00 PM (en inglés)

El costo por registrarse es de $120. (Hay becas de hasta $80 disponibles. Si le interesa solicitar una, dígale al personal del centro metropolitano cuando se registre.)

Los materiales para la clase están disponibles in español o en ingles

Los jardineros profesionales y contratistas de mantenimiento de jardines que asistan al 80% de las clases y completen satisfactoriamente un examen, recibirán un certificado de culminación y su tarjeta de Jardinería Verde De Valle de Santa Clara.

Llame al centro administrativo del MAEP al **(408)723-6450** para registrarse. Para más información sobre el programa de Jardinería Verde, visite **www.MyWatershedWatch.org**

Ayúdenos a informar a sus familiares y compañeros de trabajo sobre esta oportunidad de capacitación en el área de Jardinería Verde.

Master Gardeners of Santa Clara County

Metropolican Education District
Metrolpolitan Adult Education Program

Santa Clara Valley Urban Runoff Pollution Prevention Program

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

Announcing Santa Clara Valley Green Gardener Re-Certification Classes in 2010

A series of four classes, two in Spanish and two in English will be offered in March 2010 for any of our Green Gardener Graduates. Attending just one of these classes will meet the continuing education requirement to keep your Green Gardener card active and your name on our website. However, you may attend more than one, if you want to do so.

These classes are sponsored by the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) with the assistance of the Master Gardeners of Santa Clara County and are free to all Green Gardeners. Voluntary donations to the Master Gardener program will be accepted at the classes.

See the back of this flyer for more information and how to register for a class.

Classes in Spanish

Smart Irrigation Controllers with Richard Bean, Lane Irrigation & Laura Monczynski, Translator
Thursday March 4, 2010
4-6 PM
Sunnyvale Community Center-
Heritage Center Building
550 E. Remington Ave
Sunnyvale, CA

Controlling Common Garden Pests Using IPM (MIP) with Laura Monczynski and Kristy McCumby
Saturday, March 13, 2010
10 AM—Noon
Murphy Park Building
236 North Sunnyvale Ave.
Sunnyvale, CA

Classes in English

Smart Irrigation Controllers with Richard Bean, Lane Irrigation
Saturday, March 6, 2010
10 AM—Noon
Sunnyvale Community Center-
Heritage Center Building
550 E. Remington Ave
Sunnyvale, CA

Maintenance of California Native Plants with Agi Kehoe, Agi Kehoe Landscaping
Thursday, March 11, 2010
4-6 PM
Sunnyvale Community Center -
Heritage Center Building
550 E. Remington Ave.
Sunnyvale, CA

Smart Irrigation Controllers with Richard Bean, Lane Irrigation (Classes held in English and Spanish—Laura Moncyznski, translator)

To help save water used for landscape irrigation, learn about the features of the different brands of Smart Controllers on the market, the information you need to program them, and some of the programming basics. As of 2012, only Smart Controllers will be available for sale in California for use in new or retrofitted landscape irrigation installations.

Richard has a B.S. in Ornamental Horticulture from Cal Poly and 30 years of experience in the landscape industry. He is the owner of Lane Irrigation and has taught the Irrigation 2 and 3 classes for the Santa Clara Valley Green Gardener Program for the past two years.

Maintenance of California Native Plants with Agi Kehoe, Agi Kehoe Landscaping (Class held in English only)

Learn about the seasonal care of California native plants in the garden; irrigation, pruning, deadheading, cutting back, dividing, weeding, mulching, etc.

Agi is a Master Gardener and professional landscape designer, specializing in CA native plants and has worked in the green industry for the past 12 years. Through her own business, she designs and manages residential gardens in the Bay Area and some have been featured in the "Going Native Garden Tour". www.goingnativegardentour.org She is also an active member of the Santa Clara Valley Chapter of the California Native Plant Society and helped design several local native demonstration gardens.

Controlling Common Lawn &Garden Pests with IPM (MIP) with Laura Moncyzynski & Kristy McCumby (Class held in Spanish only)

What are some practical Integrated Pest Management techniques to deal with commonly found garden and lawn pests? Learn about ways to help control aphids, ants, snails, powdery mildew, weeds, rose rust, and other plant diseases without using pesticides.

Laura has a passion for gardening so she became a Master Gardener and Master Composter in 2001. She has served on the MG advisory board, as program coordinator and chair of the education committee. She has a MA in Psychology, a minor in Biology and continues her education with Spanish and Horticultural classes. She enjoys learning and sharing her knowledge with others

For the past 10 years, Kristy has worked for the City of Sunnyvale helping coordinate the City's approach to IPM for staff and information to residents, as well as helping coordinate the Santa Clara Valley Green Gardener program classes since 2008. Her degree is in Biology from the University of Alaska Fairbanks and she loves to garden at home using IPM practices.

Registration Form: FAX: (408) 720-8812 or Call (408) 720-8811 ext. 2 or e-mail to Miranda@eoainc.com to register for a class. THERE IS NO REGISTRATION FEE.

Name:_____

Mailing Address:_____Zip_____

Phone #:_____

E-mail:_____

Check the classe(s) you want to attend:

☐ Thursday, March 4, (4-6 PM) *Smart Irrigation Controllers* **(Spanish)** at Heritage Center Building, Sunnyvale Community Center 550 E. Remington Ave, Sunnyvale, CA

☐ Saturday, March 6 (10 AM—Noon) *Smart Irrigation Controllers* **(English)** at Heritage Center Building, Sunnyvale Community Center 550 E. Remington Ave, Sunnyvale, CA

☐ Thursday, March 11 (4-6 PM) *Maintenance of California Native Plants* **(English)** at Heritage Center Bldg, Sunnyvale Community Center 550 E. Remington Ave, Sunnyvale, CA

☐ Saturday, March 13 (10 AM—Noon) *Controlling Common Garden Pests with IPM (MIP)* **(Spanish)** at Murphy Park Building, 236 North Sunnyvale Ave, Sunnyvale, CA

Santa Clara Valley
Green Gardener Program

Para los Jardineros Verdes que Hablan Español

Para mantener su clasificación como Jardinero Verde, hay que tomar al menos una clase por año. Se ofrece dos clases en español. El 4 de marzo hay clase sobre el uso de Reguladores de Riego Inteligente (Smart Irrigation Controllers) y el 13 de marzo hay clase sobre el control de plagas sin el uso de químicos (MIP/IPM). Las clases son gratis. Se puede tomar una clase o las dos. Para inscribirse, envié su información a través de correo, fax, o por correo electrónico.

FAX: (408) 720-8812 or por correo electrónico: Miranda@eoainc.com

Nombre:_____

Domicilio:_____

Número de teléfono:_____

Domicilio del correo electrónico:_____

Marque las clases que usted quiere tomar:

- □ Jueves 4 de marzo (4-6 PM) *Reguladores de Riego Inteligente* localizado en Heritage Center, Building, Sunnyvale Community Center 550 E. Remington Ave, Sunnyvale, CA 94087

- □ Sábado 13 de marzo (10 AM— Mediodía) *Control de Plagas Sin el Uso de Químicos (MIP/IPM)* localizado en Murphy Park Building, 236 North Sunnyvale Ave, Sunnyvale, CA 94086

Santa Clara Valley
Green Gardener Program
111 W. Evelyn Avenue, Suite 110
Sunnyvale, CA 94086

Place stamp here

REMINDER: **Your Santa Clara Valley Green Gardener card is due for renewal!**

REMINDER: **You must renew your Green Gardener card before May 15th, 2010 to maintain your Green Gardener status!**

There are three options for renewing your Green Gardener card:

Option 1 - Take 2 hours of additional classes that are related to at least one of the topics covered in the class.
Option 2 - Fill out the Green Gardener Self Assessment form
Option 3 - Have 3 customers fill out the Green Gardener Customer Evaluation Form.

Complete one option, fill out the Green Gardener Card Renewal Form and send it to us.

All forms are available for download at
www.MyWatershedWatch.org/renewggcard.html

For paper copies of the forms, contact 408-720-8811 xnt. 2

Mail completed forms to: Santa Clara Valley Green Gardener Program
111 W. Evelyn Avenue, Suite 110, Sunnyvale, CA 94086 OR Fax to 408-720-8812

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 9-3

Regional IPM Partnership Program Report (Our Water, Our World)

September 15, 2010

FY 09-10 Regional IPM Partnership Program Report

Below is a report of activities and accomplishments of the Regional IPM Partnership Program (also known as *Our Water, Our World* program) for FY 09-10.

- Coordinated program implementation with major chains Home Depot, Orchard Supply Hardware, and Ace Hardware National. OSH reported "natural insecticides" sales up 8.5% compared to previous year. Home Depot increased their less toxic offerings 17.2%.
- Coordinated master print run of the following: fact sheets, shelf talkers, literature rack signage, banner, beneficial bug brochure, business card, magnet, Pest or Pal activity guide for kids, pocket guide, and Pests Bugging You? booklet.
- Updated less-toxic Product Lists: Master – by brand name version; by pest version, and OSH and Home Depot-specific lists/labels.
- Maintained *Our Water, Our World* website <http://www.ourwaterourworld.org/>.
- Provided Ask-the-Expert <http://www.ourwaterourworld.org/AskOurExpert/tabid/103/Default.aspx> service.
- Provided and staffed exhibitor booths at the following events
    - Excel Gardens Dealer Show (August 2009)
    - Ace Hardware National Show (October 2009) (see attached photo)
    - L&L Dealer Show (October 2009)
    - NorCal trade show (February 2010)
- Provided on-call assistance (e.g., display set-up, training, IPM materials review) to specific stores (e.g., OSH, Walgreens).
- Provided print advertising and article – Green Zebra guide <http://www.thegreenzebra.org/>.
- Provided print advertising – Bay Nature magazine <http://www.baynature.org/>; Bringing Back the Natives Garden Tour's garden guide; OSH weekly fliers, including 10 year anniversary ad (attached)
- Provided assistance to supplier Excel Garden Products to identify all their less toxic products and to include mention of *Our Water, Our World* in their catalog (attached). That catalog is now available online so all their customers and representatives can continue to access the current and new less toxic products.
- Received mention in articles by others: Sunset magazine (attached); San Francisco Chronicle <http://www.sfgate.com/cgi-bin/article.cgi?f=/c/a/2010/02/26/HOFJ1BVESD.DTL&type=homeandgarden>; and Edible East Bay (attached)
- Made presentations at the following events:
    - Excel Gardens Dealer Show (August 2009)
    - Urban Pesticide Committee (September 2009)

Ace has some suggestions for Helpful Earth Choices

If you stop by the Helpful Earth Choices area in the exhibit hall, you are likely to encounter Ace retailers who are passionate about environmentally friendly products.

Among those retailers on Friday was Kathy Stephenson from Maple Leaf Ace Hardware (store no. 1130) in Seattle, who spent considerable time combing through the products in the 50-percent-off deal section.

"This is my favorite booth," she said. "Ace has done a great job of providing great products. There's a terrific selection."

Stephenson, who has been in the business since she was nine years old, said her store now carries environmentally conscious products in about 30 percent of its cleaners and lawn and garden products. She said she wants to keep increasing that percentage and Ace is making it easier.

Stephenson previously purchased eco-friendly products outside of Ace. She noted, however, that Ace has recently stepped up its commitment to green products, which has brought her purchases back to Ace.

Tracey Gidich-Zupke, Ace brand manager, is happy to hear that Ace retailers are taking notice.

"We are continuing on our mission of providing the products and services that add value to the community and are gentle on the Earth," she said.

"If your demographic is keen on green, these products and services help retailers support their communities, protect their environment, and prove to be good for business."

> We are continuing on our mission of providing the products and services that add value to the community and are gentle on the Earth.
>
> Tracey Gidich-Zupke
> Ace brand manager

Besides the 50-percent-off deals that include products such as recycled dishware, eco-blowers and trimmers, water timers, and paint products, a number of other companies were invited to participate in the area. These companies include Mercury Technologies of Minnesota, Thermostat Recycling (TRC) and even Ace Paint.

TRC, from Arlington, Va., recycles mercury used in older residential thermostats. Those devices, which are found in most homes that are 10 years or older, can contain dangerous levels of mercury, said Mark Tibbetts, executive director of TRC. He said those thermostats have 3 grams of mercury in them.

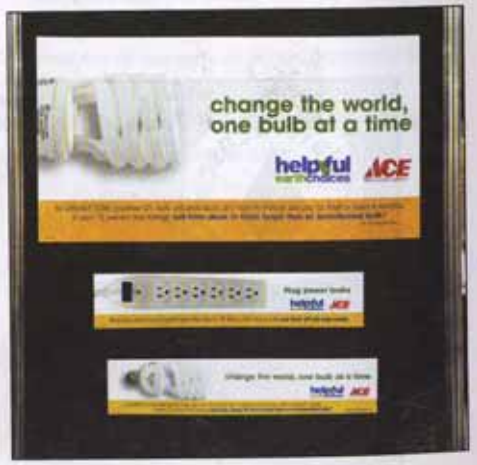
Simply tossing the unwanted thermostats in the trash is bad for the environment. Besides education, his company provides Ace retailers with plastic containers and prepaid mailing slips so they can collect old thermostats and turn them in for recycling.

Many retailers are noticing that Ace has done well to increase the scope of what is offered at the Helpful Earth Choices area and that has brought them back to Ace.

"By working with Ace retailers, we make it easy for them to be a good community partner by collecting and turning these thermostats in for recycling," Tibbetts said.

And that is the point of Helpful Earth Choices, said Ace's Gidich-Zupke.

"We offer the 50-percent-off section to provide the one-stop shop for all things green and less impactful on the environment," she said. "It's good for the environment, good for the community and good for business."



For 10 years, OSH has partnered with Our Water Our World to help customers choose less toxic products for a healthy home & garden. Our Water Our World has been recognized by the EPA with an Award for Environmental Stewardship. Visit www.ourwaterourworld.org

RESCUE!

5.99

Disposable Fly Trap • Perfect for lawn, garden, camp and farm use • No pesticides
6487706

GRANT'S KILLS ANTS

6.99

10 Pack Ant Stakes
• Destroys entire colonies of ants
2002038

Victor

5.99 ea.

17.5 Oz. Poison-Free® Hornet & Wasp Killer or Flying Insect Killer
• Uses natural plant extracts
2685030/22

6.99

Flour & Pantry Moth Trap
• Non-toxic • Attracts and kills grain moths, flour moths, meal moths and seed moths 2658797

7.99 your choice

1 Gallon Ready-To-Use Home Defense Insect Killer
• Quickly kills cockroaches, ants, spiders, fleas and more 7750383

1 Gallon Ready-to-Use Home Pest Killer • Kills insects for up to 6 months indoors 2680908

2.99

4-Pack Fly Catcher
• For indoor or outdoor use
• Does not contain pesticides
6500870

ENVIRONMENTALLY **FRIENDLY**

Here at Excel, we take pride in providing you with the most "Environmentally Friendly" products. With the help of Annie Joseph from Our Water Our World, we have identified products that have less impact on our environment.

In this catalog such products are highlighted in green.

WORRY FREE GARDEN INSECT CONTROL

Uses nature's own insecticide from the chrysanthemum flower. Also with canola oil to suffocate insects and their eggs.
Kills all stages of insects on roses, flowers, fruits & vegetables and house plants.
Contains Pyrethrins .01%, Canola Oil 1%.

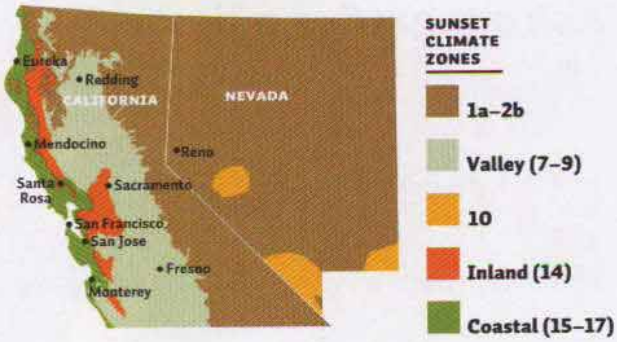
Item #	DAL	ONT	POR	SAC	Size	Model	Case	UPC
159211	X	X	X	X	24 Oz.	100500027	8	0-70624-10019-6

Disclaimer: No endorsement of specific brand name products is intended, nor is criticism implied of similar products not mentioned. Not all items that are environmentally friendly that Excel Garden Products stocks may have been identified before printing.

What to do in Northern California

September

WHAT'S YOUR ZONE?



Check out the *Sunset Western Garden Book* and our Plant Finder (*sunset.com/plantfinder*) for more about climate zones.

Get inspired and shop

Learn about sustainable gardening Attend the Late Show Gardens in Sonoma (*Sep 18–20; tickets from $20; thelateshowgardens.org or 415/721-1550*), a new event focusing on landscape ideas that address drought, global warming, and sustainability. See 18 professionally designed display gardens; go to lectures by well-known authors, photographers, and horticulturists; and buy art and top-of-the-line plants including organic, drought-tolerant, and rare choices from well-known nurseries.

Plant now

Plant garlic In mild-winter areas, start bulb sets late this month or next for a harvest in early summer. In areas that regularly get frost on consecutive nights, plant them four weeks before the last frost date. Place cloves 6 inches apart, pointed ends up, with tops 1 inch deep (in coldest zones, plant up to 4 inches deep). Buy soft-neck varieties for braiding after harvest, or hardnecks for their extra cold hardiness.

Start cool-season greens *Sunset* climate zones 7–9, 14–17: Set out transplants of broccoli, cabbage, and cauliflower. Sow seeds of bok choy, chard, mustard greens, peas, and spinach. For vivid colors and striking leaf shapes and textures, try these new seed selections from Botanical Interests (*botanicalinterests.com or 720/880-7293*): Asian Salad Mix mesclun, 'Bordeaux' spinach, 'Five Color Silverbeet' chard, and 'Ruby Streaks' mustard greens.

Tend your plot

Care for or remove lawns Deep-water grass to keep it green during this often very hot month; rake out thatch and aerate soil. Or replace your lawn this fall with shrubs and groundcovers that need little water. Check out a range of options for lawn-free landscapes on page 46.

Harvest tomatoes Let tomatoes ripen on the plant to their deepest color for maximum sweetness, then store them at room temperature. If night frost is forecast, throw a sheet over the plant. This month or next, pick the last fruits and ripen them indoors in a closed paper bag.

Outsmart pests

Manage ants Ants streaming up the trunk of a bush or tree probably are protecting scale or aphids from predators. Stop them with Tree Tanglefoot Insect Barrier (a sticky, chemical-free substance that traps crawling insects) applied to a collar of duct tape around the trunk. Otherwise, leave ants alone since they aerate the soil and clean up garden debris, advises Annie Joseph, an educator with Our Water Our World (*ourwaterourworld.org*), a program devoted to pest-management strategies that protect waterways. –HAZEL WHITE

HIGH COUNTRY GARDENS

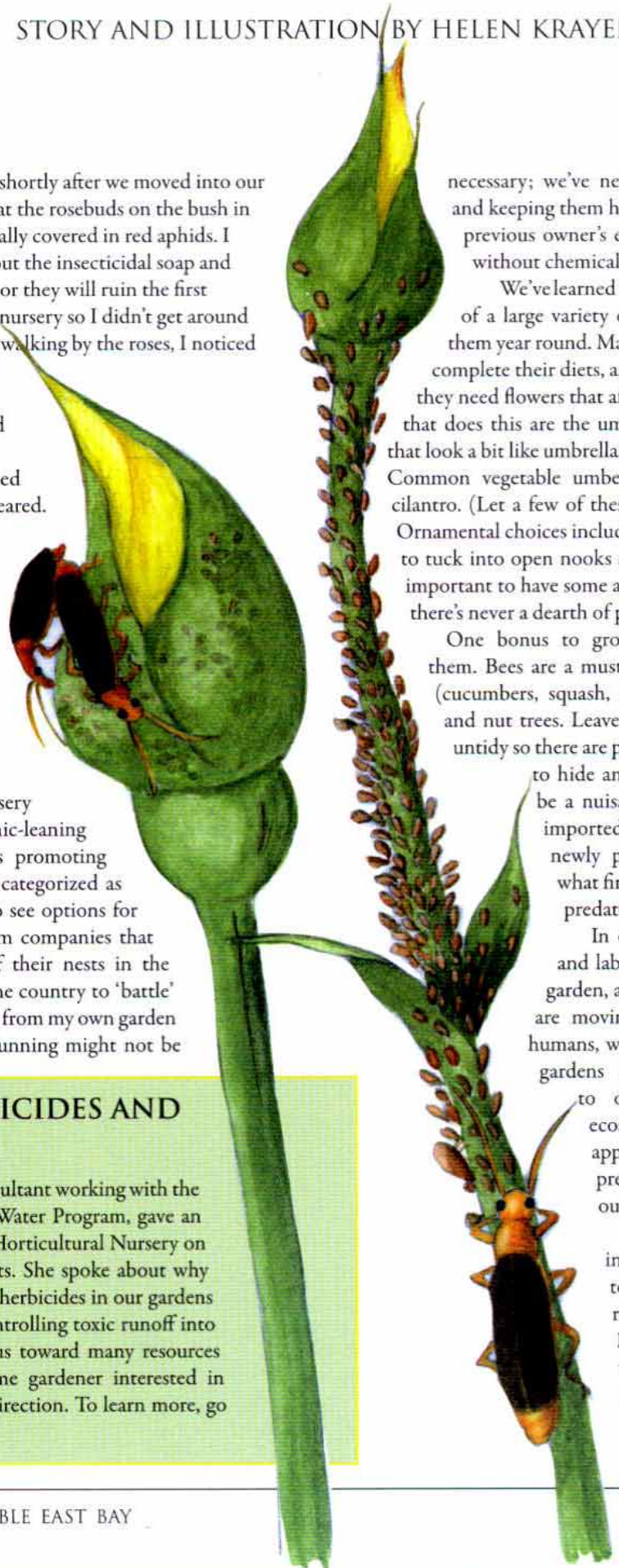
Plant a late-summer bloomer

Grow 'Frenzy' gaillardia for a bold splash of color just as other blooms begin to fade. The flower's fluted petals radiate red from the center and end in blasts of yellow for a ruffled look. This compact perennial reaches 1½ to 2 feet tall and wide. Plant it in a sunny spot with well-drained soil. Buy locally, or order from Bluestone Perennials (*bluestoneperennials.com or 800/852-5243*) or High Country Gardens (*highcountrygardens.com or 800/925-9387*). –JOHANNA SILVER

cost saver Save cash by buying perennials like rudbeckia, salvia, and yarrow instead of annual blooms that need regular replacing.

BUGS IN THE BALANCE

STORY AND ILLUSTRATION BY HELEN KRAYENHOFF



On a beautiful spring day shortly after we moved into our new house, I noticed that the rosebuds on the bush in the front yard were literally covered in red aphids. I thought to myself, "I have to get out the insecticidal soap and blast those little buggers off there or they will ruin the first flowers." It was a busy time in the nursery so I didn't get around to it. Then one afternoon as I was walking by the roses, I noticed some flying beetles hopping around on the new growth. Stopping for a closer look, I found a bevy of orange-bellied beetles feasting on the aphids. They cleaned the bush in a few days and disappeared.

This incident was the start of a whole new perspective for me on bugs. Now I look at the aphids and instead of regarding them as delinquents vandalizing our gardens I ask, "Who will follow?" I've come to regard bugs as an important part of the garden community that I am part of as well.

When I pick up any nursery trade magazine, even an organic-leaning one, I see ads from companies promoting insecticides in which insects are categorized as 'bad bugs' and 'good bugs.' I also see options for purchasing beneficial insects from companies that dig hibernating ladybugs out of their nests in the Sierra and send them all across the country to 'battle' bad bugs in our gardens. The view from my own garden indicates that this kind of bug-running might not be necessary; we've never had trouble attracting ladybugs and keeping them hanging around, in part because of the previous owner's eight-year commitment to gardening without chemicals.

We've learned that the way to encourage the presence of a large variety of bugs is to have food available for them year round. Many carnivorous insects need nectar to complete their diets, and since they have small mouth parts, they need flowers that afford easy access. One group of plants that does this are the umbellifers, which have flower clusters that look a bit like umbrellas, making the name easy to remember. Common vegetable umbellifers include carrots, parsley, and cilantro. (Let a few of these flower to see the umbrella shape.) Ornamental choices include yarrow and alyssum, which are easy to tuck into open nooks and crannies in your veggie beds. It's important to have some aphids or other prey insects as well, so there's never a dearth of protein for the predator insects.

One bonus to growing umbellifers is that bees like them. Bees are a must for pollinating your cucurbit crops (cucumbers, squash, melons, etc.) as well as many fruit and nut trees. Leave parts of your garden a bit wild and untidy so there are places for frogs and other small critters to hide and bugs to overwinter. Raccoons can be a nuisance but they also love to eat those imported French snails that in turn love our newly planted seedlings. Who will get to what first? It's the constant push-pull of prey-predator that keeps the garden healthy.

In our culture we tend to oversimplify and label things 'good' and 'bad,' but in the garden, as in life, I try to learn whether things are moving toward balance. As enterprising humans, we work so hard at making our urban gardens look tidy or natural, according to our preferences, creating artificial ecosystems that we judge mostly by their appearance. If we can step back from our preconceptions and ideas and just be in our gardens, many things are revealed.

Spend time becoming more intimate with your garden community to learn how you can develop healthy relationships and be a positive member. **Feed your plants well** but not too well: Overfed plants develop lots of soft, new green growth that's sweet and easy to chew on. Likewise, **water well** but not too much or too often.

WHY AVOID PESTICIDES AND HERBICIDES?

In March, Annie Joseph, a consultant working with the Alameda Countywide Clean Water Program, gave an enlightening talk at Berkeley Horticultural Nursery on the subject of beneficial insects. She spoke about why reducing use of pesticides and herbicides in our gardens is important to the goal of controlling toxic runoff into our waterways, and pointed us toward many resources that are available to the home gardener interested in moving in the chemical-free direction. To learn more, go to OurWaterOurWorld.org.

"Feed the soil" is a useful mantra from the organic farmers: Work on amending your soil to create good drainage and active bacteria and invertebrate life. **Mulch and compost** added consistently will ensure that your soil has ample moisture and nutrients. Be still, don't stress, don't force, and see what your garden has to reveal.

This morning as I was thawing out in the sun, contemplating my rose bushes, a flock of bushtits landed in them and poked around looking for insects on the dark red new growth. Oscar the cat and I stood transfixed until they flew on to the abutilon (flowering maple) that always has a few aphids and also provides good cover for the tiny birds. Soon, when the buds appear on the roses, I hope the soldier beetles will come for their annual visit and there will be a feast of red aphids laid out for them. All I have to do is enjoy the event. The year in the garden continues.

FURTHER READING

Insects and Gardens:
In Pursuit of a Garden Ecology
by Eric Grissell, Timber Press, 2001

Here you'll get an in-depth look at the lives of insects in the garden at a level you've probably not gone to before. It is an important new perspective that may help you move away from making those life-and-death decisions about who gets to continue to cohabitate with you.

Grissell first examines the somewhat secret lives of insects. He follows this with concepts of the ecology of gardening, explaining the function of insects in the garden as well as the interactions of insects with each other and with the plants and other animals. The last part of the book covers the gardener's perspective and offers tips for increasing diversity in the garden, showing the incredible difference that can result from those efforts. In the chapter entitled "The Realistic Gardener," the author says, "In our gardens, we have an overbearing desire for order, an overwhelming obsession with perfection, and an oversimplified concept of biological facts. Taken together, this combination can stop naturalistic processes dead in their tracks." That stopped *me* in my tracks!

I am always looking at ways to become a 'better gardener,' to have a lush veggie garden that spills over with a harvest that looks beautiful and isn't so insect damaged as to be unappetizing. This book has helped me relax and start to enjoy the process more—to see that in my quest to be healthier and grow my own food I can reconnect with the natural world in my own small plot of land here in Oakland. I hope my garden can someday be an oasis where everyone with any number of legs can prosper. Taking the time to learn about the multitudes that live here, to observe them and befriend them, both 'good' and 'bad,' moves my life in a healthier direction.

Helen Krayenhoff is co-owner of Kassenhoff Growers, a local certified organic plant nursery. You can find out more at kassenhoffgrowers.com. She is also an illustrator, watercolorist, designer, and photographer. You can see her work at helenkrayenhoff.com or check out the Berkeley Horticultural Nursery website where many of her photographs and illustrations are featured. berkeleyhort.com

INSECTARY PLANTS

The flowers on these and many other plants have nectar and pollen that are accessible to beneficial insects.

Achillea Yarrow
Anethum graveolens Dill
Anthriscus cerefolium Chervil
Aster Aster
Baccharis pilularis Coyote Brush
Calendula Calendula
Ceanothus California Lilac
Chrysanthemum Chrysanthemum
Coriandrum sativum Cilantro
Cosmos Cosmos
Erigeron Fleabane
Eriogonum Native Buckwheat
Eschscholzia californica California Poppy
Helianthus Sunflower
Heteromeles arbutifolia Toyon
Layia platyglossa Tidy Tips
Lobularia maritima Sweet Alyssum
Mimulus Monkey Flower
Nemophila menziesii Baby Blue Eyes
Prunus ilicifolia Holly-Leaved Cherry
Rosmarinus officinalis Rosemary
Rudbeckia Rudbeckia
Sambucus mexicana Elderberry
Scabiosa Pincushion Flower
Zinnia Zinnia

This list is courtesy of Our Water, Our World

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We are driven by a passion for food. Through our close relationships with local producers such as Marin Sun, Pitman, Niman, Full Belly, Blue Heron, Capay Organics, Fra'mani, Phoenix Pastaficio, Cowgirl Creamery, Fleur de Lyon, June Taylor Jams, and many others, we are able to offer a fantastic variety of products, augmented by a selection of exemplary imports. Star Meats is a full-service butcher shop and deli with great prepared dishes, house made charcuterie, and the best sandwiches in town. Come look around—If we don't have it, we'll find it for you.
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Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 12-1

Collection of Street Sweeping Data- Co-permittees

- Summary of Street Sweeping Activities for FY 2009-2010
- Summary of Co-permittee Street Sweeping Activities and Estimated Mean Pollutant Load Reduction for Copper and Nickel - FY 2009-2010
- Summary of Co-permittee Street Sweeping Activities and Estimated Mean Pollutant Load Reduction for Lead and Zinc - FY 2009-2010

September 15, 2010

Summary of Co-permittee Street Sweeping Activities - FY 2009-2010

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Municipality	Miles of Paved Streets	Total Miles Swept	Volume of Material Collected	Removal Rate Vol./ Mile	Leaf Litter Collected[15]
City of Cupertino[1,2]	308	8,284	2,298 yd^3	0.28 yd^3/miles	8,033 yd^3
City of Los Altos[1,2]	108	5,292	1,300 yd^3	0.25 yd^3/miles	2,495 yd^3 10,912 tons
City of Los Altos Hills[2]	57	1,363	41 yd^3	0.03 yd^3/miles	26 yd^3 167 tons
City of Milpitas[3,4]	126	10,348	4,970 yd^3	0.48 yd^3/miles	78 tons
City of Mountain View	340	9,196	7,620 yd^3	0.83 yd^3/miles	6,966 tons
City of Palo Alto	419	21,192	14,584 yd^3	0.69 yd^3/miles	16,084[5] yd^3 12,185[6] tons
City of San Jose	6,930	62,421	24,554 yd^3	0.39 yd^3/miles	31,381[5] tons 134,643[7] tons
City of Santa Clara[2,8,8a,9]	247	29,768	7,593 yd^3	0.26 yd^3/miles	1,427 yd^3
City of Sunnyvale[10]	734	14,768	8,769 yd^3	0.59 yd^3/miles	572 yd^3 17,221[16] tons
West Valley Communities					
City of Campbell[11]	149	5,794	1,468 yd^3	0.25 yd^3/miles	6,039 tons
Town of Los Gatos	110	11,335	905 yd^3	0.08 yd^3/miles	6,513 tons
City of Monte Sereno	28	545	73 yd^3	0.13 yd^3/miles	779 tons
City of Saratoga[2,12]	275	3,348	830 yd^3	0.25 yd^3/miles	13,787 tons
County of Santa Clara[2]	232	11,634	4,000 yd^3	0.34 yd^3/miles	
Santa Clara Valley Water District[13]					
TOTALS	**10,063 miles**	**195,288 miles**	**79,004 yd^3** **(51,313 tons)[14]**		**198,378 tons** **28,637 yd^3**
AVERAGE		**13,949 miles**	**5,643 yd^3**	**0.40 yd^3/miles**	

Notes:

1. Leaf litter included in material removed.
2. No leaf removal program other than routine street sweeping or yard waste collection.
3. Quarterly advertisement in the Milpitas Post and door hangers notifying each residential home of their sweeping day.
4. Volume does not include leaves. Leaf removal program is effective during the winter months. The City does not keep track of the volume of leaves removed, as leaf bags are picked up by solid waste garbage trucks.
5. Estimated weight of leaves collected during FY 09-10.
6. Total weight of yard trimmings (excluding leaves) collected during FY 09-10.
7. Total weight of yard trimmings (including leaves) collected during FY 09-10.
8. Leaf VAC's out on route November and December 2009.

8a. Employee Injury - March 2020-May 2010

9. Clean-up campaigns conducted in March 2010.
10. Sweeping is scheduled once per month in residential areas, more frequently in commercial areas. When requested, staff will post “No Parking” signs to remove parked cars in problem areas. Frequency is increased during heavy leaf drop season, and returned to reduced schedule during other seasons.
11. City of Campbell garbage hauler, West Valley Collection and Recycling provides containers to our residents for leaves, grass clippings, etc.
12. Extra sweeping of main arterials and residential 3 was eliminated this year due to budget constraints.
13. Does not conduct street sweeping.
14. To determine the total volume of material removed in tons, it is necessary to convert cubic yards to tons. It is estimated that the average density of street sweeping material is 1,299 pounds per cubic yard (0.6495 tons per cubic yard) (Source: EOA, Inc., October 1996, Estimation of Copper Collected Through Street Sweeping Efforts. Prepared for San Mateo Countywide Stormwater Pollution Prevention Program). A value of 53,033 tons is calculated when 79,004 cubic yards is converted over to tons (79,004 cubic yards* .6495 tons/cubic yard= 51,313 tons).
15. Includes total weight of yard trimmings collected by individual Co-permittees. Leaf litter is co-mingled with yard trimmings. Co-permittees do not have the ability to separate the weight or volume of leaves from this waste stream. This total does not include the efforts of all Co-permittees.
16. Yard trimmings from source separated collection program was 14,682 tons. Clean-green materials delivered to SMaRT station by City of Sunnyvale Residents was 2,539 tons. Total yard waste collected by the City of Sunnyvale was 17,221 tons.

Santa Clara Valley Urban Runoff Pollution Prevention Program

Summary of Co-permittee Street Sweeping Activities and Estimated Mean Pollutant Load Reduction for Copper and Nickel - FY 2009-2010

Municipality	Miles of Paved Streets	Miles Swept				Volume of Material Collected (Cubic Yards)				Estimated Mean Pollutant Load Reduction (Pounds)							
										Copper[2]				Nickel[3]			
		Res.	Com.	Ind.	Total	Res.	Com.	Ind.	Total	Res.	Com.	Ind.	Total	Res.	Com.	Ind.	Total
City of Cupertino	308	6,439	1,845	---	8,284	1,670	628	---	2,298	34.03	12.65	---	46.68	67.26	25.04	---	92.30
City of Los Altos	108	3,541	1,751	---	5,292	952	348	---	1,300	19.40	7.01	---	26.41	38.34	13.87	---	52.22
City of Los Altos Hills	57	1,363	---	---	1,363	41	---	---	41	0.84	---	---	0.84	1.65	---	---	1.65
City of Milpitas	126	5,688	4,660	---	10,348	3,012	1,958	---	4,970	61.38	39.44	---	100.82	121.32	78.07	---	199.38
City of Mountain View	340	5,713	2,110	1,372	9,196	4,719	1,767	1,134	7,620	96.16	35.59	122.55	254.30	190.06	70.45	23.72	284.24
City of Palo Alto	419	13,760	5,093	2,339	21,192	10,829	2,577	1,178	14,584	220.67	51.91	127.33	399.91	436.17	102.75	24.65	563.56
City of San Jose	6,930	37,158	25,263	---	62,421	15,099	9,455	---	24,554	307.68	190.45	---	498.13	608.16	376.98	---	985.13
City of Santa Clara	247	23,763	6,005	---	29,768	6,104	1,489	---	7,593	124.38	29.99	---	154.38	245.86	59.37	---	305.22
City of Sunnyvale[3]	734	10,478	4,290	---	14,768	6,743	2,026	---	8,769	137.40	40.81	---	178.21	271.59	80.78	---	352.37
West Valley Communities																	
City of Campbell	149	3,166	2,628	---	5,794	812	656	---	1,468	16.55	13.21	---	29.76	32.71	26.16	---	58.86
Town of Los Gatos	110	7,595	3,740	---	11,335	606	299	---	905	12.35	6.02	---	18.37	24.41	11.92	---	36.33
City of Monte Sereno	28	414	131.00	---	545	63	10	---	73	1.27	0.20	---	1.48	2.52	0.40	---	2.92
City of Saratoga	275	2,568	780	---	3,348	686	143	---	830	13.98	2.89	---	16.87	27.64	5.71	---	33.35
County of Santa Clara	232	680	10,954	---	11,634	267	3,733	---	4,000	5.44	75.19	---	80.64	10.75	148.84	---	159.59
Santa Clara Valley Water District[1]																	
TOTALS	**10,063**	**122,326**	**69,251**	**3,711**	**195,288**	**51,603**	**25,089**	**2,312**	**79,004**	**1,052**	**505**	**250**	**1,807**	**2,078**	**1,000**	**48**	**3,127**

Notes:

1. Does not conduct street sweeping.

2. To determine the estimated pollutant load reduction of copper (in pounds), the volume of material collected from each Co-permittee land use type (i.e., residential, commercial and industrial) was multiplied by the mean concentration of trace metal content for street sweeping samples determined in the study entitled Chemical and Physical Characteristics of Street Sweeping Sediments in Tampa, Florida, May 1999. In this study, the mean copper concentration for samples collected in residential areas (n=51) was 23.51 mg/kg. In addition the mean copper concentrations for samples collected in commercial (n=17) and industrial (n=7) areas was 23.24 mg/kg and 124.71 mg/kg, respectively. These values were then converted over to pounds and summed to represent the estimated mean pollutant load reduction for copper. A sample calculation is as follows: (1670*23.51*6.43*0.785*0.85)/(0.00495*1000*1000) = 34.03

3. To determine the estimated pollutant load reduction of nickel (in pounds), the volume of material collected from each Co-permittee land use type (i.e., residential, commercial and industrial) was multiplied by the mean concentration of trace metal content for street sweeping samples determined in the study entitled Chemical and Physical Characteristics of Street Sweeping Sediments in Tampa, Florida, May 1999. In this study, the mean nickel concentration for samples collected in residential areas (n=51) was 46.47 mg/kg. In addition the mean nickel concentrations for samples collected in commercial (n=17) and industrial (n=7) areas was 46.00 mg/kg and 24.14 mg/kg, respectively. These values were then converted over to pounds and summed to represent the estimated mean pollutant load reduction for nickel. A sample calculation is as follows: (952*46.47*6.43*0.785*0.85)/(0.00495*1000*1000)= 38.34

Santa Clara Valley Urban Runoff Pollution Prevention Program

Summary of Co-permittee Street Sweeping Activities and Estimated Mean Pollutant Load Reduction for Lead and Zinc - FY 2009-2010

Municipality	Mile of Paved Streets	Miles Swept				Volume of Material Collected (Cubic Yards)				Estimated Mean Pollutant Load Reduction (Pounds)							
										Lead[2]				Zinc[3]			
		Res.	Com.	Ind.	Total	Res.	Com.	Ind.	Total	Res.	Com.	Ind.	Total	Res.	Com.	Ind.	Total
City of Cupertino	308	6,439	1,845	---	8,284	1,670	628	---	2,298	63.40	60.42	---	123.82	85.34	42.81	---	128.15
City of Los Altos	108	3,541	1,751	---	5,292	952	348	---	1,300	36.14	33.48	---	69.62	48.65	23.72	---	72.37
City of Los Altos Hills	57	1,363	---	---	1,363	41	---	---	41	1.56	---	---	1.56	2.10	---	---	2.10
City of Milpitas	126	5,688	4,660	---	10,348	3,012	1,958	---	4,970	114.35	188.38	---	302.72	153.92	133.48	---	287.40
City of Mountain View	340	5,713	2,110	1,372	9,196	4,719	1,767	1,134	7,620	179.14	170.01	114.97	464.12	241.15	120.46	94.62	456.22
City of Palo Alto	419	13,760	5,093	2,339	21,192	10,829	2,577	1,178	14,584	411.11	247.93	119.46	778.50	553.40	175.67	98.32	827.39
City of San Jose	6,930	37,158	25,263	---	62,421	15,099	9,455	---	24,554	573.21	909.66	---	1,482.87	771.61	644.55	---	1,416.16
City of Santa Clara	247	23,763	6,005	---	29,768	6,104	1,489	---	7,593	231.73	143.26	---	374.99	311.94	101.51	---	413.44
City of Sunnyvale	734	10,478	4,290	---	14,768	6,743	2,026	---	8,769	255.99	194.92	---	450.91	344.59	138.11	---	482.70
West Valley Communities																	
City of Campbell	149	3,166	2,628	---	5,794	812	656	---	1,468	30.83	63.11	---	93.94	41.50	44.72	---	86.22
Town of Los Gatos	110	7,595	3,740	---	11,335	606	299	---	905	23.01	28.77	---	51.77	30.97	20.38	---	51.35
City of Monte Sereno	28	414	131.00	---	545	63	10	---	73	2.37	0.97	---	3.34	3.20	0.69	---	3.88
City of Saratoga	275	2,568	780	---	3,348	686	143	---	830	26.05	13.78	---	39.83	35.07	9.77	---	44.84
County of Santa Clara	232	680	10,954	---	11,634	267	3,733	---	4,000	10.14	359.15	---	369.29	13.64	254.48	---	268.12
Santa Clara Valley Water District[1]																	
TOTALS	**10,063**	**122,326**	**69,251**	**3,711**	**195,288**	**51,603**	**25,089**	**2,312**	**79,004**	**1,959**	**2,414**	**234**	**4,607**	**2,637**	**1,710**	**193**	**4,540**

Notes:

1. Does not conduct street sweeping.

2. To determine the estimated pollutant load reduction of lead (in pounds), the volume of material collected from each Co-permittee land use type (i.e., residential, commercial and industrial) was multiplied by the concentration of trace metal content for street sweeping samples determined in the study entitled Street Sweeping for Pollutant Removal, Department of Environmental Protection, Montgomery County, Maryland, February 2002. In this study, the lead concentration for samples collected in residential areas was 43.8 mg/kg. In addition the lead concentrations for samples collected in commercial and industrial areas was 111 mg/kg and 117 mg/kg, respectively. These values were then converted over to pounds and summed to represent the estimated mean pollutant load reduction for lead. A sample calculation is as follows: (1670*43.8*6.43*0.785*0.85)/(0.00495*1000*1000)= 63.40.

3. To determine the estimated pollutant load reduction of zinc (in pounds), the volume of material collected from each Co-permittee land use type (i.e., residential, commercial and industrial) was multiplied by the mean concentration of trace metal content for street sweeping samples determined in the study entitled Chemical and Physical Characteristics of Street Sweeping Sediments in Tampa, Florida, May 1999. In this study, the mean zinc concentration for samples collected in residential areas (n=51) was 58.96 mg/kg. In addition the mean zinc concentrations for samples collected in commercial (n=17) and industrial (n=7) areas was 78.65 mg/kg and 96.29 mg/kg, respectively. These values were then converted over to pounds and summed to represent the estimated mean pollutant load reduction for zinc. A sample calculation is as follows: (952*78.65*6.43*0.785*0.85)/(0.00495*1000*1000)= 48.65.

Santa Clara Valley
Urban Runoff
Pollution Prevention Program

Appendix 15

MRP Regional Supplement for Pollutants of Concern and Monitoring

Appendix A: Pollutants of Concern

A1 Pesticide Regulation for Water Quality Protection - Annual BASMAA Participation Summary and Outcomes Assessment 2010. Prepared by TDC Environmental, LLC. August 30, 2010.

A2 Clean Watersheds for a Clean Bay - Implementing the San Francisco Bay PCBs and Mercury TMDLs with a Focus on Urban Runoff. Bay Area Stormwater Management Agencies Association (BASMAA). April 19, 2010.

A3 Clean Watersheds for a Clean Bay (CW4CB) Project Status. Memorandum prepared by Kristin Kerr and Jon Konnan, EOA, Inc., for the CW4CB Project Management Team. September 13, 2010.

A4 Draft Stormwater Pump Station Diversions Feasibility Evaluation. Prepared by Brown and Caldwell, Inc. September 13, 2010

A5 Methods for Quantifying Mercury and PCB Loads Reduced From Urban Stormwater Runoff. Working Draft Technical Memorandum prepared by EOA, Inc. September 10, 2010

A6 RMP Special Study Proposal: Synthesis of Information on Mercury

A7 Coversheet of the Pollutants of Concern Stormwater Inspectors' Guidance Manual

A8 PCBs in Caulk Project, Revised Workplan, Taking Action for Clean Water: Bay Area TMDL Implementation. Prepared by the San Francisco Estuary Partnership. December 2009.

A9 Field Sampling and Chemical Analysis Plan for the PCBs in Caulk Project (Taking Action for Clean Water Bay Area TMDL Implementation). Prepared by Susan Klosterhaus, San Francisco Estuary Institute. July 2010 (draft).

A10 Quality Assurance Project Plan for the PCBs in Caulk Project (Taking Action for Clean Water Bay Area TMDL Implementation). Prepared by Susan Klosterhaus, San Francisco Estuary Institute. July 2010 (draft).

A11 RMP Special Study Proposal: Synthesis of Information on PCBs

A12 Sustainable Conservation Investor's Circle Update, Fourth Quarter 2009

A13 SB 346 as amended June 21, 2010

A14 Fact Sheet —Reducing Water Pollution Caused by Vehicle Brake Pads

A15 Fact Sheet on SB 346 as amended June 7, 2010

A16 BASMAA Support Letter for SB 346, June 3, 2010
A17 RMP Special Studies Proposal for 2011: Impact of dissolved copper on the olfactory system of seawater-phase juvenile salmon

Appendix B: Water Quality Monitoring

B1 Table of Contents from Draft BASMAA Regional Monitoring Coalition Multi-Year Work Plan
B2 RMP contributions by stormwater programs (2009 and 2010)
B3 RMP Small Tributaries Loading Strategy, Draft June 26, 2009

Appendix A

MRP Regional Supplement for POCs and Monitoring
Appendix A

A1

tdc environmental

Pesticide Regulation for Water Quality Protection

Annual BASMAA Participation Summary and Outcomes Assessment 2010

Documentation of action taken to comply with San Francisco Bay Area Municipal Regional Stormwater NPDES Permit, Order R2-2009-0074, Section C.9.e.

Prepared for the Bay Area Stormwater Management Agencies Association

August 30, 2010

PREFACE

This is a report of research performed by TDC Environmental, LLC for the Bay Area Stormwater Management Agencies Association (BASMAA). This report was prepared to assist San Francisco Bay Area municipalities with documenting compliance with Municipal Regional Stormwater Permit Provision C.9.e. Preparation of this report was funded by the Alameda Countywide Clean Water Program through an agreement with Applied Marine Sciences, Inc.

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ACKNOWLEDGEMENTS

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- Arleen Feng and James Scanlin, Alameda Countywide Clean Water Program (ACCWP)
- Athena Honore, San Francisco Estuary Partnership
- Dave Tamayo, Sacramento County Stormwater Quality Program

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Pesticide Regulation for Water Quality Protection Annual BASMAA Participation Summary and Outcomes Assessment 2010

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EXECUTIVE SUMMARY

Section C.9.e. of the San Francisco Bay Area Municipal Regional Stormwater NPDES Permit (MRP) requires tracking and participating in pesticide-related California and Federal regulatory processes and reporting on these activities. This regional report is intended to document actions taken to comply with Section C.9.e.i. to fulfill the reporting requirement in Section C.9.e.ii. The time period covered by this report is July 1, 2009 through June 30, 2010 (fiscal year [FY] 2010).

During this time period, Bay Area Stormwater Management Agencies Association (BASMAA) members participated in pesticide regulatory activities through the California Stormwater Quality Association (CASQA). CASQA is supported by its statewide membership—including BASMAA agencies--which manage, staff, and fund consultant support for pesticide regulatory engagement. CASQA also relied on the Urban Pesticide Pollution Prevention Project (UP3 Project) for tracking California and Federal pesticide regulatory activities, identifying priorities for municipality engagement, and coordinating CASQA's regulatory engagement with the pesticide regulatory activities of California municipal wastewater treatment plants and the State Water Resources Control Board and Regional Water Quality Control Boards. All of these agencies relied on the UP3 Project to provide scientific information, regulatory analysis, and assistance in communicating with pesticide regulators.

The ultimate goals of CASQA's and BASMAA's pesticide regulatory engagement are to prevent surface water impairment and to prevent violations of stormwater NPDES permits (see Section 4.1). Major FY 2010 objectives were to end pyrethroid-related toxicity in California urban watersheds without transitioning to other harmful products and to encourage changes in California and Federal pesticide regulatory processes such that these processes effectively prevent future water quality and compliance problems.

CASQA's pesticide regulatory engagement prioritized the pesticides of concern listed in the MRP (see Section 3.2). Pyrethroid insecticides, which have been linked to widespread toxicity in creek waters and sediments, were the highest priority for pesticide regulatory involvement. CASQA wrote 6 letters, participated in 2 public workshops, and 6 regulatory process meetings to provide information and recommendations to pesticides regulators (see Section 3.3 and Table 2). CASQA also shared information with regulators and other stakeholders at four Urban Pesticides Committee meetings and through UP3 Project informal contacts with regulators (Table 2).

Although regulatory processes can take many years to reach outcomes, the results of pesticide regulatory engagement are starting to be evident, and show substantial progress toward the BASMAA, CASQA, and Water Board goals of preventing surface water impairment from pesticides, implementing the Diazinon and Pesticide-Related Toxicity in Bay Area Urban Creeks Water Quality Attainment Strategy and Total Maximum Daily Load, and preventing pesticide-related violations of stormwater NPDES permits (see Section 4 and Table 3). Nevertheless, much additional work will be needed to end pyrethroid-related toxicity in urban watersheds and to achieve the ultimate goal of ensuring that pesticides do not interfere with Clean Water Act compliance.

1.0 INTRODUCTION

1.1 Scope of This Report

The San Francisco Bay Area Municipal Regional Stormwater NPDES Permit includes the following provision for tracking and participating in pesticide-related regulatory processes and for reporting on these activities:

> ***C. 9. e. Track and Participate in Relevant Regulatory Processes*** *(may be done jointly with other Permittees, such as through CASQA or BASMAA and/or the Urban Pesticide Pollution Prevention Project)*
>
> ***i. Task Description***
>
> *(1) The Permittees shall track USEPA pesticide evaluation and registration activities as they relate to surface water quality, and when necessary, encourage USEPA to coordinate implementation of the Federal Insecticide, Fungicide, and Rodenticide Act and the CWA and to accommodate water quality concerns within its pesticide registration process;*
>
> *(2) The Permittees shall track California Department of Pesticide Regulation (DPR) pesticide evaluation activities as they relate to surface water quality, and when necessary, encourage DPR to coordinate implementation of the California Food and Agriculture Code with the California Water Code and to accommodate water quality concerns within its pesticide evaluation process;*
>
> *(3) The Permittees shall assemble and submit information (such as monitoring data) as needed to assist DPR and County Agricultural Commissioners in ensuring that pesticide applications comply with water quality standards; and*
>
> *(4) As appropriate, the Permittees shall submit comment letters on USEPA and DPR re-registration, re-evaluation, and other actions relating to pesticides of concern for water quality.*
>
> ***ii. Reporting*** *– In their Annual Reports, the Permittees who participate in a regional effort to comply with C.9.e. may reference a regional report that summarizes regional participation efforts, information submitted, and how regulatory actions were affected. All other Permittees shall list their specific participation efforts, information submitted, and how regulatory actions were affected.*

This regional report is intended to document actions taken to comply with Section C.9.e.i. to fulfill the reporting requirement in Section C.9.e.ii. The time period covered by this report is July 1, 2009 through June 30, 2010 (fiscal year [FY] 2010).

1.2 Report Organization

This report is organized as follows:

- *Section 1* (this section) provides the scope and organization of the report.

- *Section 2* explains why BASMAA members have joined municipalities across California in participating in pesticide regulatory activities and summarizes the major California and Federal pesticide review processes.
- *Section 3* summarizes FY 2010 pesticide regulatory engagement.
- *Section 4* evaluates the outcomes of pesticide regulatory engagement to the extent that outcomes were known as of July 2010 (most pesticide regulatory processes of interest in FY 2010 are still underway).

2.0 BACKGROUND

2.1 Pesticides and Water Quality—A Regulatory Gap

Numerous scientific studies have demonstrated that use of some pesticides registered in accordance with Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) requirements can adversely affect aquatic species. Those impacts can, in turn, cause violations of water quality standards. As a result of discharges containing pesticides registered for use by the U.S. Environmental Protection Agency (U.S. EPA), many surface waters in California have been designated as "impaired" in accordance with Federal Clean Water Act §303(d). This finding means that the surface waters do not meet water quality standards. These listings demonstrate that current U.S. EPA and California Environmental Protection Agency (Cal-EPA) procedures for regulating pesticides are insufficient to ensure that pesticide use does not cause violations of the Federal Clean Water Act and California Porter-Cologne Water Quality Control Act.

Federal law provides U.S. EPA with the ability to protect surface water from pesticides. California law technically provides two parts of the California Environmental Protection Agency (Cal-EPA), the California Department of Pesticide Regulation (DPR) and California state water quality regulators, with the ability to protect surface water from pesticides. Except in extraordinary circumstances, California Water Boards defer pesticides regulation to DPR.

While the mandates of these pesticide and water quality laws differ slightly, the approaches to implementing these two groups of laws are very different and have important ramifications for pesticides and water quality. In general, pesticide regulatory programs are structured to respond slowly when water quality problems occur—and without financial penalties to pesticide manufacturers or users. In contrast, water quality programs are generally structured to react quickly when water quality problems occur—with immediate financial consequences, particularly for municipalities. Pesticide regulators and water quality regulators employ very different procedures to manage pesticides. While these differences sometimes seem arcane, they create regulatory gaps that leave states and municipalities responsible for solving water quality problems that could have been prevented at the time a pesticide was registered or re-registered.

Three groups of agencies that manage California's water quality are working with pesticide regulators to address this regulatory gap: the State Water Resources Control Board and Regional Water Quality Control Boards ("Water Boards"), municipal wastewater treatment plants (also known as sewage treatment plants or publicly-owned treatment works [POTWs]), and urban runoff management agencies (including BASMAA members). This report refers to these three groups of agencies collectively as "California water quality agencies."

Urban runoff management agencies—including BASMAA's members—have conducted their portion of this effort through their statewide organization, the California Stormwater Quality Association (CASQA).

Why California Municipalities Are Working with Pesticide Regulators

California municipalities began regular engagement in pesticide regulatory processes because they had concluded that the most cost-effective approach to protecting surface water from pesticide-related toxicity is to <u>prevent</u> pesticide uses that have significant potential to cause water quality impairment or that cause violations of NPDES permits.

Preventing water quality problems at the source is well known to be more effective—and far less costly—than alternatives.

The recent scientific finding that pyrethroid insecticides are linked to widespread toxicity to sediment-dwelling organisms in California urban creeks[1] has increased the importance of active California municipality participation in California and Federal pesticide regulatory processes. Since California law precludes local regulation of pesticides, municipal urban runoff programs must rely on pesticide regulators to solve this problem.

Role of the Urban Pesticide Pollution Prevention Project (UP3 Project)

Because understanding and participating in regulatory activities is complex and time-intensive, CASQA, the Water Boards, and POTWs found that they needed scientific and regulatory support to participate in pesticide regulatory processes. The Urban Pesticide Pollution Prevention (UP3) Project was established in mid-2004 specifically to provide this much-needed support.

To maximize the effectiveness of their pesticide regulatory involvement and minimize cost, CASQA, the Water Boards, and POTWs have organized their pesticide regulatory involvement efforts jointly. Since its inception, the UP3 Project has taken on the role of coordinating the joint cooperative regulatory involvement effort.

The UP3 Project supports California water quality agency participation in pesticide regulatory actions by identifying and tracking pesticide regulatory processes of significant interest for water quality, analyzing pesticide regulatory documents to identify water quality protection gaps, and reviewing scientific studies to assemble the information needed to fill the identified gaps. The UP3 Project assists water quality agencies with communicating this information directly to regulators at U.S. EPA, and California Department of Pesticide Regulation (DPR) through letters, meetings, informal communications, and presentations.

To coordinate agency activities and facilitate dialog, the UP3 Project also manages the Urban Pesticides Committee (UPC), which serves as a center for information exchange, coordination, and collaboration among local, regional, and state agencies and other stakeholders seeking to end pesticide-related surface water toxicity problems.

The UP3 Project operates an announcement-only e-mail list for UPC members to keep them up to date on regulatory, scientific, and educational program developments.

The UP3 Project also maintains a web site (www.up3project.org) that provides documents and other resources to assist agencies with implementing programs to prevent pesticide-related water quality problems.

From its inception through 2010, UP3 Project has been funded by a State Water Resources Control Board grant administered by the San Francisco Estuary Partnership (SFEP). TDC Environmental has provided technical support for the project.

The UP3 Project is currently seeking funding to allow it to continue after the end of 2010.

2.2 U.S. EPA and DPR Pesticide Review Processes

California water quality agencies primarily engage with pesticide regulators within the existing regulatory processes established by U.S. EPA and DPR. Both U.S. EPA and

[1] The many scientific studies documenting this toxicity are summarized in TDC Environmental (2008). *Pesticides in Urban Surface Water: Annual Review of New Scientific Findings 2008*, prepared for the UP3 Project. April.

DPR have processes to review pesticides prior to their first use and processes to respond to human health and environmental problems that occur after a pesticide is approved for use. Both agencies also have the responsibility to review all pesticides periodically. Table 1 (on the next two pages) provides a brief description of the various pesticide review processes conducted by U.S. EPA and DPR and identifies the public input opportunities associated with each process.

If a pesticide-related water quality problem (like the problems with diazinon, chlorpyrifos, and the pyrethroids) is documented in the environment, the DPR regulatory process offers the most immediate response mechanism. DPR's pesticide "reevaluation" process is structured to respond to environmental problems more rapidly than the "special review" process at U.S. EPA.

On the basis of the structure of the public involvement processes and the nature pesticide regulatory agency authorities, two pesticide regulatory processes have been the focus of regulatory engagement: U.S. EPA Pesticide Registration Review and California DPR pesticide reevaluation. While the focus is on engagement in formal regulatory processes, the participation has extended to less formal situations, to facilitate a sharing of scientific information and to increase mutual understanding of the regulatory context provided by California and Federal pesticide and water quality legal frameworks.

Table 1: Summary of U.S. EPA and DPR Pesticide Review Processes

Agency	Process	Description	Overview of Public Input Opportunities
U.S. EPA	Registration	New pesticides must be registered or exempted by U.S. EPA before they may be sold. New uses of existing pesticides must also be registered. During registration, U.S. EPA evaluates effects on humans and the environment (including surface water).	Other than making its registration workplan available,[2] U.S. EPA has no public involvement process for pesticide registration.
	Registration review	All currently registered pesticides are planned for review on a 15-year cycle.[3] Each pesticide's review process starts with a "docket opening," which is an opportunity to submit scientific information and to comment on the registration review workplan. Subsequent steps are established by the workplan.	Public involvement opportunities after the docket opening depend on the workplan; these may include opportunities to review U.S. EPA-prepared risk assessments, to provide recommendations for risk reduction options, and to comment on U.S. EPA's proposed registration review decision.
	Special review	U.S. EPA initiates special review when it discovers that the use of a registered pesticide may result in unreasonable adverse effects on humans or the environment. The special review process usually involves intensive review of a specific problem. During special review, U.S. EPA may review scientific information, re-evaluate the identified risk, and select risk reduction measures.	Processes vary. At a minimum, the public is offered the opportunity to comment on the decision proposed by U.S. EPA on the basis of its special review.

[2] Conventional pesticides - http://www.epa.gov/opprd001/workplan/ ; Biopesticides - http://www.epa.gov/pesticides/biopesticides/regtools/biopesticides_2010_workplan.html ; Antimicrobial pesticides - http://www.epa.gov/oppad001/

[3] Schedules are available on the Internet: http://www.epa.gov/oppsrrd1/registration_review/schedule.htm

Table 1: Summary of U.S. EPA and DPR Pesticide Review Processes (Continued)

Agency	Process	Description	Overview of Public Input Opportunities
DPR	Registration	California has a state requirement for pesticide registration. Like U.S. EPA, it evaluates effects on humans and the environment. Unlike U.S. EPA (which reviews products containing the same active ingredient as group) DPR registers each pesticide product individually. DPR determines whether to evaluate a pesticide product's potential to cause surface water quality or wastewater discharge impacts on a case by case basis.	Other than making lists of products entering review available, DPR has no public involvement process for pesticide registration. By providing these lists to its interagency advisory committee (the Pesticide Registration and Evaluation Committee), DPR provides an opportunity for interagency consultation.
	Annual Registration Renewal	California law requires annual renewal of all pesticide registrations. This review is very brief; ordinarily, registrations are renewed if fees are paid and if registrants certify compliance with the requirement to disclose factual or scientific evidence of any adverse effect or risk of the pesticide to human health or the environment.	DPR issues a formal notice of the proposed annual renewal for all pesticides and provides a comment period. Because the notice does not include pesticide-specific information, the process serves as an annual opportunity for the public to provide DPR with information about adverse effects of pesticides.
	Reevaluation	If DPR finds that a significant adverse impact has occurred or is likely to occur from the use of a pesticide, it initiates a reevaluation. During reevaluation, DPR reviews existing data and may require development of additional data related to the impacts of the pesticide. DPR's goal is to identify ways to reduce or eliminate confirmed problems.	DPR has no formal public involvement process for reevaluation; however, it has offered selected stakeholders opportunities to review various documents associated with the reevaluation of pyrethroid insecticides. DPR usually consults with its interagency advisory committee (the Pesticide Registration and Evaluation Committee) when approaching major reevaluation decisions.

3.0 PESTICIDE REGULATORY ENGAGEMENT SUMMARY

3.1 BASMAA Participated through CASQA and UP3 Project

Since 2005, urban runoff management agencies—including BASMAA's members—have conducted their engagement in pesticide regulatory activities through their statewide organization, the California Stormwater Quality Association (CASQA). In keeping with this strategy, the BASMAA Monitoring/Pollutants of Concern (POC) Committee established that BASMAA's FY 2010 pesticide regulatory involvement would be conducted via CASQA. In FY 2010, MRP Permittees participated in pesticide regulatory processes through CASQA.

CASQA has a Pesticides Subcommittee that manages its day-to-day involvement in pesticide regulatory activities. In fiscal year 2010, the subcommittee had two co-chairs: Jamison Crosby of the Contra Costa Clean Water Program (CCCWP) and Dave Tamayo of the Sacramento County Stormwater Quality Program. Ten teleconference meetings were held in FY 2010. Representatives of the Alameda Countywide Clean Water Program (ACCWP), the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP), and the City of Palo Alto are also on the subcommittee roster. Both CCCWP and ACCWP actively participated in subcommittee meetings in FY 2010.

The CASQA Pesticides Subcommittee coordinates stormwater agency participation in pesticide regulatory activities. The subcommittee determines the actions to be taken by CASQA, provides direction to its representatives for participation in agency meetings, peer reviews draft correspondence, and shares information among members. As co-chair, Ms. Crosby has assumed a role in identifying financial resources necessary to support CASQA's activities (which are obtained not only from CASQA but also through contributions from member agencies) and in managing committee-related contracts.

Ms. Crosby provides the linkage between CASQA and the BASMAA Monitoring/POC Committee.

3.2 Engagement Prioritized Pesticides of Concern in the MRP

U.S. EPA and DPR regulatory processes involve thousands of pesticides each year. Only a small fraction of these pesticides pose significant threats to the quality of urban runoff. CASQA has focused its participation in pesticide regulatory processes on pesticides identified by the UP3 Project as most likely to threaten urban surface water quality through urban runoff.[4] Of these pesticides, the highest priorities are the same current-use pesticides listed as pesticides of concern in the MRP (pyrethroids, fipronil, carbamates, and organophosphorous pesticides).

On the basis of urban watershed monitoring data from across California and urban pesticide use estimates assembled by the UP3 Project, when further prioritization is necessary, CASQA has followed the UP3 Project recommendation to prioritize the pyrethroids (bifenthrin, cyfluthrin, beta-cyfluthrin, cypermethrin, deltamethrin, esfenvalerate, lambda-cyhalothrin, permethrin, and tralomethrin) and fipronil.[5] Among the pyrethroids, those most commonly linked to aquatic toxicity (bifenthrin, cyfluthrin [including beta-cyfluthrin], and cypermethrin) have been prioritized.

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[4] For the most recent list see TDC Environmental (2010). Pesticides in Urban Runoff, Wastewater, and Surface Water. Annual Review of new Scientific Findings 2010. Prepared for the UP3 Project. March.
[5] TDC Environmental (2008). Pesticides of Interest for Urban Surface Water Quality. Urban Pesticides Use Trends Annual Report 2008. Prepared for the UP3 Project. July 30; Moran, K. D. (2007). "Urban Use of the Insecticide Fipronil—Water Quality Implications." Memorandum prepared for the UP3 Project. June 18.

According to UP3 Project analysis, organophosphates (chlorpyrifos, diazinon, and malathion) and carbamates (carbaryl) are lower priorities than the pyrethroids and fipronil. Neither diazinon nor chlorpyrifos pose a continuing threat to urban watersheds now that U.S. EPA has prohibited almost all urban use.[6] Similarly, urban watersheds are benefitting from significant reductions in use of both carbaryl and malathion, likely the consequence of U.S. EPA regulatory requirements.[7]

3.3 Engagement Summary for Fiscal Year 2010

CASQA and UP3 Project Conducted All Four Tasks Listed in MRP Section C.9.e.

CASQA encouraged USEPA and DPR to coordinate implementation of pesticide and water laws to accommodate water quality concerns as required under MRP sections C.9.e.i.(1) and (2) and submitted comment letters as required under C.9.e.1.(4). Table 2 (on the following pages) lists specific CASQA and BASMAA member actions, including meetings and correspondence.

In FY 2010, CASQA relied on the UP3 Project to complete the pesticide evaluation and registration activities tracking required under C.9.e.i.(1) and (2) and the assembly and submittal of information to DPR as required under C.9.e.i.(3). UP3 Project regulatory tracking tables for FY 2010 are available on the UP3 Project website together with other Urban Pesticides Committee (UPC) meeting materials. Due to the suspension of grant funding for part of the fiscal year, tracking tables were prepared four times during the fiscal year instead of bimonthly. UP3 Project submittal of information to DPR is included in Table 2.

During the UP3 Project's 2009 grant hiatus, UP3 Project regulatory tracking, communications with U.S. EPA and DPR, and one FY 2010 UPC meeting were partially funded by two Bay Area municipalities: the Cities of San Francisco and Palo Alto. (Other funding was provided by other CASQA members and by POTWs).

California Pyrethroid Reevaluation Was 2010 Priority

Responding to widespread toxicity in California surface waters linked to pyrethroid insecticides, in August 2006 DPR initiated regulatory action ("reevaluation") to identify mitigation measures to address the toxicity. DPR has offered California water quality agencies—including CASQA—opportunities to provide information at various junctures in the pyrethroid reevaluation. Participating in DPR's pyrethroid reevaluation was the top priority for CASQA in FY 2010. DPR has responded to California water quality agency engagement—the level of interagency information-sharing occurring in the pyrethroid reevaluation is unprecedented in the history of DPR reevaluations.

[6] For this reason they were dropped from the UP3 List of pesticides of concern in urban runoff (see TDC Environmental (2010). Pesticides in Urban Runoff, Wastewater, and Surface Water. Annual Review of new Scientific Findings 2010. Prepared for the UP3 Project. March.)

[7] TDC Environmental (2010). Pesticides in Urban Runoff, Wastewater, and Surface Water. Annual Urban Pesticide Use Data Report 2010. Prepared for the UP3 Project. June 28.

Table 2: Pesticide Regulatory Process Participation in FY 2010

Organization	Process	Action	Desired Outcome
U.S. EPA	Office of Pesticide Programs (OPP) and Office of Water (OW) Effects Assessment Methodology Reconciliation Project	CASQA Letter – August 25, 2009 Thanked U.S. EPA for initiating project, requested project scope expansion to include differences in aquatic toxicity test species, asked that the U.S. EPA project team be expanded to include OW Office of Wastewater Management, and that the project be designed to consider both fresh and salt water. Oral testimony by representatives of CASQA, CCCWP, ACCWP, and SCVURPPP at U.S. EPA stakeholder meeting – January 22, 2010 Thanked U.S. EPA for conducting the project, explained the regulatory gap caused by inconsistent effects assessment methods between the two U.S. EPA Offices, provided examples of aquatic toxicity resulting from this gap, described costs to municipalities to respond to this toxicity, and requested that U.S. EPA expand the scope of the project to resolve the toxicity testing differences.	Expand project scope to examine approaches for coordinating OPP's effects assessments with the OW-approved toxicity testing procedures. Educate U.S. EPA OPP environmental risk assessors. Draw attention to pesticide-related toxicity in urban watersheds and ask U.S. EPA to change its regulatory processes so that they identify and prevent this toxicity.
	Advanced Notice of Proposed Rulemaking – Pesticide Inert Ingredients Disclosure	CASQA letter – February 22, 2010 Supported U.S. EPA's intention to require disclosure of pesticide inert ingredients. Urged U.S. EPA to develop this rule so as to capture the full range of such chemicals that may be harmful to human health or the environment, and to require public disclosure of their presence in any products that are available for use by "consumers" including both government agencies and the general public. Provided responses to specific questions raised by U.S. EPA describing how the regulation could best be designed to assist with water quality protection. San Francisco Department of the Environment letter – April 21, 2010 Echoed CASQA's comments plus provided information based on City experience operating a municipal integrated pest management program.	Disclosure of pesticide inert ingredient identities to assist with efforts to prevent water pollution. Of interest because some "inert" (other) pesticide ingredients are water pollutants; others facilitate the transport of pesticides into urban runoff.

Table 2: Pesticide Regulatory Process Participation in FY 2010 (Continued)

Organization	Process	Action	Desired Outcome
U.S. EPA	Esfenvalerate Registration Review	CASQA letter – February 16, 2010 Requested specific changes to Registration Review workplan, including an exposure assessment for urban uses of esfenvalerate including both water column and sediments as well as cumulative risks with other pyrethroids in urban watersheds. Supported proposed environmental risk assessment data request list. Recommended utilization of existing information from the scientific literature, from surface water monitoring programs, and from the DPR pyrethroid reevaluation.	Changes to the registration review process to better identify and mitigate urban water quality impacts and adoption of these changes as part of U.S. EPA's overall approach to the registration review process for all pesticides with urban use patterns.
	Deltamethrin Registration Review	CASQA letter - June 1, 2010 Requested specific changes to Registration Review workplan, including an exposure assessment for urban uses of deltamethrin including both water column and sediments as well as cumulative risks with other pyrethroids in urban watersheds. Recommended utilization of existing information from surface water monitoring programs and from the DPR pyrethroid reevaluation.	Changes to the registration review process to better identify and mitigate urban water quality impacts and adoption of these changes as part of U.S. EPA's overall approach to the registration review process for all pesticides with urban use patterns.
	None	The UP3 Project provided the following information to U.S. EPA: • Information on fipronil to support concerns about its presence in urban runoff – December 2009 • Paper on urban runoff modeling approaches - January 2010 • Conceptual model for pyrethroids in urban runoff – March 2010	Improve U.S. EPA's scientific understanding of pesticides in urban runoff such that EPA has sufficient scientific information to structure regulatory processes to ensure that pesticide applications comply with water quality standards.

Table 2: Pesticide Regulatory Process Participation in FY 2010 (Continued)

Organization	Process	Action	Desired Outcome
DPR	Pyrethroid Reevaluation	<u>CASQA/PWG Meeting – July 22, 2009</u> At DPR's request, CASQA representatives, including Jamison Crosby of CCCWP, met directly with PWG to explain concerns with the slow pace of the pyrethroids reevaluation including the potential for high monitoring costs for municipalities due to pyrethroids and associated toxicity, and the ongoing threat of third-party lawsuits. CASQA asked for faster progress and for the next steps to be rooted in a conceptual model developed on the basis of the extensive existing scientific literature about pollutants in urban runoff. CASQA and PWG agreed that communications processes for to the pyrethroid reevaluation needed to be improved. <u>CASQA/PWG Meeting – December 9, 2009</u> At DPR's request, CASQA met with PWG to provide verbal comments to PWG on its draft conceptual model for pyrethroids in urban runoff and a draft list of scientific studies proposed to fill what PWG had identified as priority data gaps. Agreed with the general conceptual model with some minor modifications, but found the model was not structured in a manner that meets the needs for the next steps in the pyrethroid reevaluation. Recommended significant modifications to the list of scientific studies and an urban runoff literature review to eliminate perceived data gaps and provide a scientifically based focus for study designs and mitigation proposals.	End pyrethroid-related toxicity in California urban watersheds without transitioning to other harmful products. Educate DPR about pesticide-related toxicity in urban watersheds. Ask DPR to change its regulatory processes so that it identifies and prevents such toxicity.
		<u>PWG Controlled Urban Pyrethroid Applications and Monitoring Study – CASQA Letter July 10, 2009</u> Recommended against pursuing this study proposal because it would be time-consuming and would have a low probability of providing useful information. Detailed scientific comments supported these points.	

Table 2: Pesticide Regulatory Process Participation in FY 2010 (Continued)

Organization	Process	Action	Desired Outcome
DPR	Pyrethroid Reevaluation	PWG Applicator Survey Proposal – Input to Sacramento County Letter to DPR, January 28, 2010 Because DPR afforded an abbreviated review period for this PWG study proposal, CASQA did not have time to complete required internal peer review prior to submitting a letter. To provide a quicker alternative, Sacramento County volunteered to incorporate CASQA's recommendations into a letter to DPR. Recommendations included focusing the survey on priority data gaps about professional structural pest control identified by the UP3 Project (differentiating outdoor, indoor, underground, and pre-construction termiticide applications and understanding the relative quantities applied on outdoor impervious and pervious surfaces); reducing the survey length and taking other actions to increase participation; and making other changes to increase the validity of survey results.	See above
		CASQA meeting with DPR & Water Boards – March 17, 2010 Requested faster pace toward ending pyrethroid-related toxicity in urban watersheds. Explained concerns with the slow pace of the pyrethroids reevaluation including the potential for high monitoring costs for municipalities due to pyrethroids and associated toxicity, and the ongoing threat of third-party lawsuits. DPR announced its intent to initiate monthly stakeholder meetings, and requested participation of CASQA decision-makers. CASQA agreed. Obtained insight into practical aspects of various DPR regulatory options to address pyrethroid-related toxicity.	

Table 2: Pesticide Regulatory Process Participation in FY 2010 (Continued)

Organization	Process	Action	Desired Outcome
DPR	Pyrethroid Reevaluation	<u>DPR Pyrethroid Reevaluation Stakeholder Meetings (PRSM meetings) – Monthly starting in May 2010 (two in FY 2010)</u> Initiated monthly meetings among DPR, CASQA, the Water Boards, POTWs, PWG, and professional pest control applicators to improve communications, to conduct joint fact finding, to identify priority data gaps requiring additional information to be generated by pyrethroid manufacturers, and to identify mitigation strategies to end pyrethroid-related toxicity in urban watersheds. In FY 2010 meetings, the stakeholder group came to agreement on a conceptual model for pyrethroids in urban runoff, shared information about the feasibility and environmental benefits of various pyrethroid mitigation strategies, and shared relevant scientific information with DPR and other stakeholders. CASQA and the UP3 Project provided the following information to DPR at FY 2010 meetings: • A CASQA-UP3 Project alternative conceptual model for pyrethroids in urban runoff prepared with joint funding from the UP3 Project. • A UP3 Project compilation of bifenthrin monitoring data for urban runoff and urban watersheds across California. • A UP3 Project compilation of available pyrethroid environmental fate data to highlight data gaps and to show indications that bifenthrin's slow environmental degradation is one of several reasons that it alone is the largest contributor to pyrethroid-related toxicity in urban watersheds.	See above
		<u>Conceptual model for Pyrethroids in Urban Runoff</u> CASQA and the UP3 Project jointly funded UP3 Project development of a conceptual model for pyrethroids in urban runoff that can be used to quantify the linkage between urban pyrethroid use patterns and pyrethroids in urban waterways. The UP3 Project provided the model to U.S. EPA and DPR, and shared it with these agencies other stakeholders via presentations at the following events: • American Chemical Society Pyrethroids session – March 24,2010 • DPR PRSM meeting May 2010	

Table 2: Pesticide Regulatory Process Participation in FY 2010 (Continued)

Organization	Process	Action	Desired Outcome
DPR	Surface Water Regulatory Concept	Teleconference meeting with DPR – November 18, 2009 Thanked DPR for pursuing regulatory concept. Supported adoption of surface water protection regulations. Learned about DPR's approach to the regulations. Asked questions on areas of concern like the list of covered pesticides and the exemption for applicators participating in a "green or sustainable program." Obtained feedback from DPR that will be used to inform the preparation of written comments. Oral testimony by a representatives of CASQA and CCCWP at DPR Workshop –February 11, 2010 Thanked DPR for pursuing regulatory concept. Supported adoption of surface water protection regulations. Requested DPR establish clear water quality protective standards and process for the exemption for applications under a "green or sustainable program."	Implement effective measures to prevent water pollution associated with professional urban pesticide use. Include in regulatory structure the ability to control pesticides most likely to threaten urban surface water quality through urban runoff, including pesticides that might be registered in the future.
	Pest Management Advisory Committee (PMAC)	DPR PMAC meetings - Quarterly DPR has one general external stakeholder advisory group, called the Pest Management Advisory Committee. A CASQA representative (Dave Tamayo of the Sacramento County Stormwater Quality Program) participates in most meetings and is formally an alternate member of the committee (the lead member in the seat is a POTW representative).	Educate DPR and other urban pest management stakeholders.
	None	The UP3 Project provided the following information to DPR: • Scientific information relevant to two new outdoor urban insecticides (indoxacarb and spinosad), their aquatic toxicity and potential water quality impacts – March 2010	Improve DPR's scientific understanding of pesticides in urban runoff such that EPA has sufficient scientific information to structure regulatory processes to ensure that pesticide applications comply with water quality standards.

Table 2: Pesticide Regulatory Process Participation in FY 2010 (Continued)

Organization	Process	Action	Desired Outcome
UP3 Project	Urban Pesticides Committee (UPC) Meetings	UPC meetings - Four meetings in FY 2010 The UPC serves as a center for information exchange, coordination, and collaboration among local, regional, and state agencies and other stakeholders seeking to end pesticide-related surface water toxicity problems. Examples of information and insights shared by CASQA in 2010 include: • Concerns about the slow pace of the pyrethroid reevaluation and need for an approach based on existing scientific literature relevant to urban runoff. • Summaries of meetings with pyrethroid manufacturers. • Concerns with the ongoing pyrethroid-related toxicity—the potential for high monitoring costs for municipalities due to pyrethroids and associated toxicity, and the ongoing threat of third-party lawsuits. • Perspectives on the National Pest Management Association's Green Pro certification. • Updates on participation in California and Federal pesticide regulatory activities.	Educating other stakeholders through informal interactions. Become informed about issues relevant to the development of regulatory and non-regulatory measures to prevent pesticide-related water pollution.

Table 2: Pesticide Regulatory Process Participation in FY 2010 (Continued)

Organization	Process	Action	Desired Outcome
County Agricultural Commissioners	None	MRP Permittees had the following communications with County Agricultural Commissioners regarding pest management to improve water quality protection: • Contra Costa County has been meeting regularly (bimonthly) with the Agricultural Commissioner's office to cover all topics related to integrated pest management (IPM). Meetings were held on July 1, 2009; September 2, 2009; November 4, 2009; January 6, 2010; March 3, 2010 and May 5, 2010. Topics included discussions of the various IPM methods being used by the Flood Control and Water Conservation District (including weed abatement with manual labor, tractor mower, sheep grazing, and spot spraying of broadleaf weeds) and by County Departments (regarding the placement of sticky traps to monitor pest invasions, placement of door sweeps, sealing of cracks, and other physical deterrents [including the use of the "Rodenator"], while encouraging biological controls with the installation of owl boxes and raptor perches). • In June 2010, the City of Concord asked the Contra Costa County Agricultural Commissioner's office for advice in dealing with a sudden surge of bugs this summer in some city parks. The Agricultural Commissioner confirmed the bugs were leaf hoppers and since they do not bite or sting and their populations were predicted to drop sharply in a few weeks, no treatment was recommended. Concord city staff monitored the parks to confirm that the problem did indeed go away in a few weeks without the use of pesticides.	Encourage Agricultural Commissioners to strengthen incorporation water quality protection into their implementation of local pesticide regulatory programs.

4.0 EVALUATION OF 2010 OUTCOMES

4.1 Goals and Objectives for Pesticide Regulatory Engagement

The goals of CASQA's and BASMAA's engagement in pesticide regulatory processes are:

1. To prevent surface water impairment.
2. To prevent violations of stormwater NPDES permits.

To achieve these goals, CASQA has three long-term objectives for its participation in pesticide regulatory processes:

A. Improve design of pesticide water quality impact evaluations. Pesticide water quality impact evaluations conducted by U.S. EPA and DPR should be based on all available scientific information, assess the impacts of pesticides transported to surface water via all pathways (including urban runoff), fully address all urban use patterns, and incorporate evaluation endpoints consistent with Clean Water Act regulatory endpoints.

B. Encourage pesticide regulators to address urban surface water quality in pesticide risk management decisions and to do so in a timely manner. Pesticide risk management decisions should address all significant surface water quality risks including those posed by urban pesticide use patterns, consider costs to water quality agencies, be implemented quickly when water quality problems occur, and prevent new environmental or health impacts from future pesticide market shifts.

C. Seek meaningful public participation opportunities for water quality agencies. To achieve the above objectives, pesticide regulatory decisions relevant to water quality need to include public participation processes that make all relevant information available for water quality agency review and provide opportunity for water quality agencies to share information to ensure that decisions are based on accurate scientific and management information and include practical and effective risk management strategies.

Major FY 2010 objectives were:

- To end pyrethroid-related toxicity in California urban watersheds without transitioning to other harmful products.
- To encourage changes in pesticide regulatory processes such that these processes effectively prevent future water quality and compliance problems.

4.2 Overview of Past Outcomes

Regular interagency dialogue about pesticide-related water quality problems started with the formation of the Urban Pesticides Committee (UPC) in the mid-1990s. By the late 1990s, California water quality agencies recognized that while the information-exchange forum provided by the UPC is valuable, informal dialogue with pesticide manufacturers and pesticide regulators was not a sufficient means to achieve the changes needed to ensure long-term water quality protections from the impacts of urban pesticide use.

In 1999, California water quality agencies started to engage in pesticide regulatory processes on an ongoing basis. In 2003, the scope of the effort was increased in recognition of the water quality threat posed by the market shift to pyrethroid insecticides

in response to the phase out of most urban uses of diazinon and chlorpyrifos. Beginning in mid-2004, the effort was further strengthened due to State Water Board grant funding to the UP3 Project, which provided California water quality agencies with an ongoing base of scientific and regulatory support for their individual engagement with pesticide regulators.

Although the process was slow at first, by 2005 staff from both pesticide and water quality regulatory agencies had recognized the importance of pesticide-related water quality issues. By 2007, pesticide regulators had recognized and acknowledged that gaps in their regulatory processes—particularly gaps related to urban pesticide use—were connected to urban water quality problems from pesticides.

In 2006, pesticide regulatory agencies began to take specific steps to address pesticide-related urban surface water quality problems. At the Federal level, U.S. EPA changed allowable uses for several pesticides due to water quality problems. California DPR initiated the pyrethroid reevaluation in response to water quality problems and created the Urban Pest Management Workgroup to give it advice on development of management strategies specific to pesticide use in urban areas.

In 2007-2009, further changes continued, particularly at the Federal level. Federal regulators required a few initial measures to prevent washoff of pyrethroids into urban runoff. Federal regulators also initiated the Office of Pesticide Programs (OPP) and Office of Water (OW) Effects Assessment Methodology Reconciliation Project to address a regulatory gap highlighted in California water quality agency comments.

4.3 FY 2010 Outcomes

Table 3 (on the next two pages) summarizes the outcomes of CASQA's recent pesticide regulatory engagement. Outcomes since the last UP3 Project regulatory outcomes evaluation in December 2008[8] are included in the table.

In FY 2010, encouraging progress continued. Federal pyrethroid Registration Review workplans acknowledged the need to address urban runoff. California regulators floated the idea of surface water protection regulations, including measures to protect urban runoff. DPR accelerated the pace of the pyrethroid reevaluation and solved a communication problem by initiating monthly stakeholder meetings.

While these specific outcomes reflect meaningful progress toward achieving the goals listed above, the goals of California water quality agency engagement in pesticide regulatory processes have not yet been fully achieved. The record shows that the engagement of California water quality agencies has significantly improved water quality protection since their initial engagement in the 1990s.

This evaluation is necessarily an interim evaluation. The types of processes that CASQA and other California water quality agencies have engaged in take years to complete—and the systemic changes desired will probably take many years to implement fully. Due to the complexity of pesticide regulatory processes, responses to comments may not be issued for more than one year after comments are submitted and outcomes often occur years after comments are made.

In evaluating regulatory outcomes, it is important to recognize that water quality is but one of many economic, social, and environmental factors that U.S. EPA and DPR consider when making regulatory decisions.

[8] TDC Environmental (2009). Pesticides in Urban Runoff, Wastewater, and Surface Water. Annual Summary of Regulatory Activities to Protect Water Quality 2008. Prepared for the UP3 Project. December.

Table 3. FY 2010 Pesticide Regulatory Engagement Outcomes

Regulatory Process	Desired Outcome	Actual Outcome	Assessment of Relationship of Water Quality Agency Involvement to Outcome
U.S. EPA Antimicrobials Data Rule	Require manufacturers to provide all data necessary for a complete evaluation of urban runoff impacts when a pesticide is registered or is subject to registration review.	Unknown. Waiting for U.S. EPA to finalize the regulation.	To be determined
U.S. EPA Office of Pesticide Programs (OPP) and Office of Water (OW) Effects Assessment Methodology Reconciliation Project	Expand project scope to examine approaches for coordinating OPP's effects assessments with the OW-approved toxicity testing procedures. Educate U.S. EPA OPP environmental risk assessors. Draw attention to pesticide-related toxicity in urban watersheds and ask U.S. EPA to change its regulatory processes so that they identify and prevent this toxicity.	Project-specific outcome unknown. Waiting for U.S. EPA to take next step in project. Education goals apparently achieved as evidenced by improved, more well-informed environmental risk assessment workplans for pyrethroids.	Project-specific relationship cannot yet be determined <u>High</u> for education goals. Informal communications with U.S. EPA indicate a direct linkage between California communications and environmental risk assessment workplan improvements.
U.S. EPA Advanced Notice of Proposed Rulemaking – Pesticide Inert Ingredients Disclosure	Disclosure of pesticide inert ingredient identities to assist with efforts to prevent water pollution.	Unknown. Waiting for U.S. EPA to issue the draft regulation.	To be determined
U.S. EPA Esfenvalerate, Deltamethrin, and Cyphenothrin Registration Review	Changes to these registration review processes to better identify and mitigate urban water quality impacts and adoption of these changes as part of U.S. EPA's overall approach to the registration review process for all pesticides with urban use patterns.	Unknown. Waiting for U.S. EPA to issue final workplans.	To be determined

Table 3. FY 2010 Pesticide Regulatory Engagement Outcomes (Continued)

Regulatory Process	Desired Outcome	Actual Outcome	Assessment of Relationship of Water Quality Agency Involvement to Outcome
DPR Pyrethroid Reevaluation	End pyrethroid-related toxicity in California urban watersheds without transitioning to other harmful products. Educate DPR about pesticide-related toxicity in urban watersheds. Ask DPR to change its regulatory processes so that it identifies and prevents such toxicity. 2010 priorities: Implement mitigation measures quickly. Modify process to increase the pace toward a full solution.	As of July 2010, the reevaluation process had not generated significant new scientific information nor had substantial progress been made toward an end to pyrethroid-related toxicity. Initial mitigation is being implemented. At DPR's request, U.S. EPA asked all pyrethroid manufacturers to submit revised product labels implementing a set of water quality protection mitigation measures by June 2010. DPR restructured the reevaluation process to include monthly stakeholder meetings intended to increase the pace of the reevaluation toward ending pyrethroid-related toxicity.	High. Without active involvement by CASQA and other California Water Quality Agencies, reevaluation would probably still be stalled. Label change process was initiated in response to joint CASQA/Water Board comments and was based on a list of potential early mitigation measures provided with the comments.
DPR Surface Water Regulatory Concept	Implement effective measures to prevent water pollution associated with professional urban pesticide use. Include in regulatory structure the ability to control pesticides most likely to threaten urban surface water quality through urban runoff, including pesticides that might be registered in the future.	Initial goal achieved—DPR has announced its intent to proceed with development of formal regulations. Detailed outcome is unknown. CASQA is currently preparing detailed comments and is waiting for DPR to issue first draft of formal regulation.	High. It is unlikely that DPR would have included urban areas in these regulations without CASQA/Water Board engagement and UP3 Project scientific information linking professional pesticide applications to water pollution.

Source: TDC Environmental evaluation of U.S. EPA and DPR regulatory documents and meetings.

Acronyms

ACCWP – Alameda Countywide Clean Water Program

BASMAA – Bay Area Stormwater Management Agencies Association

Cal-EPA – California Environmental Protection Agency

CASQA – California Stormwater Quality Association

CCCWP – Contra Costa Clean Water Program

DPR – California Department of Pesticide Regulation

FIFRA – Federal Insecticide, Fungicide, and Rodenticide Act

FY – Fiscal Year (July 1 through June 30)

MRP – Municipal Regional Permit (NPDES permit for urban runoff from Bay Area municipalities)

NPDES permit – National Pollutant Discharge Elimination System permit (permit for discharge of wastewater or urban runoff to surface waters)

OPP – U.S. EPA Office of Pesticide Programs

OW – U.S. EPA Office of Water

PMAC – DPR Pest Management Advisory Committee

POTW – Publicly-Owned Treatment Works (municipal wastewater treatment plant)

PRSM – Pyrethroid Reevaluation Stakeholder Meetings hosted by DPR

PWG – Pyrethroid Working Group (organization of pyrethroid insecticide manufacturers)

SCVURPPP – Santa Clara Valley Urban Runoff Pollution Prevention Program

SFEP – San Francisco Estuary Partnership

TMDL – Total Maximum Daily Load (regulatory plan for solving a water pollution problem)

UP3 Project – Urban Pesticides Pollution Prevention Project

UPC – Urban Pesticides Committee

U.S. EPA – United States Environmental Protection Agency

MRP Regional Supplement for POCs and Monitoring
Appendix A

A2

Project Title: ***CLEAN WATERSHEDS FOR A CLEAN BAY*** - Implementing the San Francisco Bay PCBs and Mercury TMDLs with a Focus on Urban Runoff.

Abstract: Clean Watersheds for a Clean Bay (CW4CB) will use a partnership-driven strategy to take the next step in a multi-year regional effort to reduce loading of sediment-bound pollutants to the Bay and implement the PCBs and mercury Total Maximum Daily Load (TMDL) water quality restoration programs. CW4CB will make substantial progress towards reducing annual loading of PCBs and mercury to the Bay and will lay the groundwork for fully meeting the TMDL allocations in the future. CW4CB will select five high priority subwatersheds that discharge urban runoff with PCBs and other pollutants to the Bay, identify PCB and mercury source areas within the project subwatersheds and refer these sites to regulatory agencies for cleanup and abatement, develop methods to enhance removal of sediment with PCBs and other pollutants during municipal sediment management activities, retrofit eight to 10 urban runoff treatment facilities into existing infrastructure throughout the Bay Area, and facilitate development and implementation of a regional risk reduction program that focuses on educating the public about the health risks of consuming certain species of Bay fish that contain high levels of PCBs and mercury. The knowledge and experience gained and the lessons learned during CW4CB will be promoted and made readily available to inform future similar efforts by others in the Bay Area and elsewhere in California and the United States.

Applicant: Bay Area Stormwater Management Agencies Association (BASMAA)
Principal Investigator: Geoff Brosseau (BASMAA Executive Director)
P.O. Box 2385, Menlo Park, CA 94026, (510) 622-2326, info@basmaa.org

Funding Requested: $5 Million

Total Project Cost: $6.84 Million ($1.84 Million Non-Federal Match)

Project Period: Four Years (May 2010 – April 2014)

Proposal Narrative Organization

This proposal narrative consists of the following sections: 1) Introduction, 2) Project Overview, 3) Problem Statement, 4) Environmental Results, 5) Partnering and Budget Narrative 6) Scope of Work, and 7) Programmatic Capability. These sections are followed by Attachment A) Resumes, B) Support Letters, and C) Watershed Maps.

1. Introduction

San Francisco Bay is one of the largest and most biologically diverse estuaries on the west coast of the United States. The Bay Area basin (Figure 1) is world renowned for its scenic beauty, commercial and industrial enterprises, recreational opportunities, fisheries, and wildlife habitat. All of these features are vital to the health and economies of the local communities, where more than seven million people live and work in the highly developed watersheds that surround the Bay. The water quality of this precious resource is inextricably linked to historical and current human activities in these urban watersheds. Urban stormwater runoff is of particular concern as it conveys many types of pollutants from the urban landscape to the Bay.

The Bay Area Stormwater Management Agencies Association (BASMAA), a 501(c)(3) non-profit organization representing Bay Area cities and counties, focuses on a number of regional challenges related to stormwater runoff, including identifying opportunities to improve the quality of urban runoff that flows to the Bay. The water quality link between the Bay and its surrounding watersheds inspired BASMAA to propose the project described below - Clean Watersheds for a Clean Bay (CW4CB).

Figure 1. Map of San Francisco Bay Basin.

2. Project Overview

CW4CB represents the next step in a multi-year regional effort that began in 2000 to reduce loading of sediment-bound pollutants to the Bay and implement the PCBs and mercury Total Maximum Daily Load (TMDL) water quality restoration programs. CW4CB will select five high priority subwatersheds that discharge urban runoff with PCBs and other pollutants to the Bay, usually in areas with industrial land uses dating back many decades. CW4CB will then identify PCB and mercury source areas within the project subwatersheds and refer these sites to regulatory agencies for cleanup and abatement. CW4CB will also develop methods to enhance removal of sediment with PCBs and other pollutants during municipal sediment management activities (e.g., street sweeping) in the project subwatersheds. Furthermore, CW4CB will retrofit eight to 10 urban runoff treatment facilities into existing infrastructure throughout the Bay Area to address areas with elevated PCBs and other pollutants in urban runoff. Yet another element of this project will facilitate development and implementation of a regional risk reduction program that focuses on educating the public about the health risks of consuming certain species of Bay fish that contain high levels of PCBs and mercury. Finally, the knowledge and experience gained and the lessons learned during CW4CB will be promoted and made readily available to inform future similar efforts by others in the Bay Area and elsewhere in California and the United States. BASMAA is requesting $5M in project funds from USEPA's San Francisco Bay Area Water Quality Improvement Fund towards the $6.84M total project cost. The remaining $1.84M (about 27% of the total project cost) will be a match contributed by BASMAA and six of the Bay Area countywide stormwater management agencies.

3. Problem Statement

PCBs, mercury and other sediment-bound pollutants are found in San Francisco Bay water, sediments, and biota. Concentrations of PCBs and mercury in certain Bay fish exceed target levels and may pose a health risk to people who consume fish caught in the Bay. As a result, the California Office of Environmental Health Hazard Assessment issued an advisory on the consumption of fish from the Bay. Thus it was established that a vital beneficial use of the Bay, commercial and sport fishing, is not attained, with local subsistence fishers and their families being of particular concern. This led to the Bay being designated an impaired water body on the Clean Water Act "303(d) list" due to PCBs and mercury. In response, the San Francisco Bay Regional Water Quality Control

Board (Regional Water Board) has developed comprehensive TMDL programs to identify and control sources of PCBs and mercury to the Bay and restore water quality.

It has long been suspected that municipal stormwater discharges may contribute to the PCB and mercury water quality problem in the Bay, but before the year 2000 there was little direct evidence to support this hypothesis. BASMAA agencies addressed this data gap by surveying concentrations of PCBs and mercury in embedded sediments collected from stormwater conveyances (e.g., catch basins, storm drain system piping, stormwater pump station sumps, flood control channels, and creeks) throughout the Bay Area during the fall of 2000 and 2001. This project is referred to as the Joint Stormwater Agency Project (JSAP). PCB and mercury concentrations were highly variable in urban locations, but ranged up to three orders of magnitude higher than in open space areas. Concentrations were also up to two orders of magnitude higher in urban sediment than in Bay surface sediments collected and analyzed by the San Francisco Estuary Regional Monitoring Program (RMP), suggesting that urban runoff may impact the Bay.

Over the next several years following the JSAP, individual stormwater programs performed case studies in selected urban areas with relatively elevated pollutant concentrations to begin identifying sources and controls, with a focus on PCBs. The techniques employed included further collection and analysis of embedded sediment samples and research on historical and current land use. About 20 areas were investigated.

Most recently, a California Proposition 13-funded project implemented by the San Francisco Estuary Institute (SFEI) performed additional sediment surveys for PCBs and mercury, with the goal of better defining urban watersheds and subwatersheds with elevated levels of these pollutants throughout the Bay Area. The results of this effort are anticipated to be available in the near future.

All of these efforts have identified some watersheds with relatively elevated levels of PCBs and mercury and in a few cases source areas were discovered within these watersheds, but much work remains to be done to identify remaining source areas and in particular, to implement methods to prevent discharges of stormwater runoff containing PCBs, mercury and other pollutants from urban watersheds to the Bay.

4. Environmental Results - Project Outputs and Outcomes

CW4CB is the next step in the above-described multi-year regional effort to reduce loading of PCBs, mercury and other sediment-bound pollutants (e.g., dioxins, PBDEs, chlorinated pesticides and PAHs) to the Bay from urban watersheds, reduce levels entering the estuary food chain, and thereby reduce harm to aquatic ecosystems and human communities.[1,2]

CW4CB's overarching objective is to implement priority actions called for by the San Francisco Bay PCBs and mercury TMDLs and make substantial progress towards attaining the PCB TMDL urban runoff allocation. Although CW4CB is anticipated to reduce loadings of mercury and other sediment-bound pollutants to the Bay as an ancillary benefit, project activities will be designed and implemented to optimize the reduction of PCB loads. CW4CB's effectiveness evaluation will also focus on PCB load reductions. It is anticipated that the combined effect of all project activities will

[1]EPA Strategic Plan Goal 2 (Clean and Safe Water), Objective 2.2 (Protect Water Quality), and Sub-Objective 2.2.1 (Improve Water Quality on a Watershed Basis).
[2]EPA Strategic Plan Goal 4 (Healthy Communities and Ecosystems) and Objective 4.3 (Restore and Protect Critical Ecosystems).

reduce annual loading of PCBs to the Bay by approximately 0.3 - 1.5 kg per year, reducing the current estimated stormwater runoff load of 20 kg per year[3] by about two to eight percent. Furthermore, CW4CB will lay the groundwork for fully meeting the TMDL allocations in the future and thereby help address important impairments to the Bay's beneficial uses. Table 1 summarizes key project tasks and associated outputs and outcomes.

CW4CB is comprised of priority activities that will achieve significant and sustainable environmental results, based on the planning and assessment work completed for the PCB and mercury TMDLs. The TMDL urban runoff requirements will be implemented through the San Francisco Bay Area NPDES Municipal Regional Stormwater Permit (MRP).[4] The MRP is anticipated to be adopted in the near future and will require a number of PCBs and mercury control activities that are consistent with the TMDLs and CW4CB's tasks. CW4CB's general strategy is also consistent with the San Francisco Bay Basin (Region 2) Water Quality Control Plan (Basin Plan), the Bay Area Integrated Regional Water Management Plan, and the San Francisco Estuary Project Comprehensive Conservation and Management Plan, as summarized in below.

SF Bay Basin (Region 2) Water Quality Control Plan (Basin Plan) (January 2007)
- ✓ 2. Beneficial Uses
- ✓ 3. Water Quality Objectives
- ✓ 4. Implementation Plans
- ✓ 5. Plans and Policies

PCBs & Mercury Total Maximum Daily Loads (TMDLs) (February 2008)
- ✓ Water Quality Attainment Strategies
- ✓ Urban Runoff Allocations

San Francisco Bay Area NPDES Municipal Regional Stormwater Permit
(Tentative Order, 2-11-2009)
- ✓ C.11/12.c - Investigate and Abate Sources of PCBs and Mercury
- ✓ C.11/12.d - Enhance Municipal Sediment Management Practices
- ✓ C.11/12.e - Urban Runoff Treatment Retrofits
- ✓ C.11/12.i - Regional Risk Reduction Program

Bay Area Integrated Regional Water Management Plan (November 2006)
- ✓ Goal A: Contribute to the promotion of economic, social, and environmental sustainability
- ✓ Goal D: Contribute to the protection and improvement of the quality of water resources
- ✓ Goal E: Contribute to the protection of public, health, safety, and property
- ✓ Goal F: Contribute to the protection of environmental resources and habitats.
- ✓ Water Management Strategies

San Francisco Estuary Project Comprehensive Conservation and Management Plan (2007 Update) Key Program Areas:
- ✓ Aquatic Resources
- ✓ Wildlife
- ✓ Pollution Prevention and Reduction
- ✓ Land Use Management
- ✓ Public Involvement and Education
- ✓ Research and Monitoring

[3]PCBs Total Maximum Daily Load, SFBRWQCB, February 2008.
[4]Municipal Regional Permit, Revised Tentative Order, February 11, 2009.

Table 1. Summary of Key CW4CB Tasks and Associated Budgets, Outputs and Outcomes.

TASK	IMPLEMENTING PARTIES	USEPA FUNDING	MATCH	TOTAL	OUTPUTS/OUTCOMES
1. Management, oversight, and reporting.	BASMAA, TAC, QAPP consultant.	--	$460,000	$460,000	▪ QAPP, quarterly progress reports, draft/final project report.
2. Select project watersheds.	BASMAA.	--	$30,000	$30,000	▪ Five priority subwatersheds identified.
3. Identify locations with elevated PCBs/Hg, refer sites to regulatory agencies, and establish cleanup fund.	BASMAA, records review consultant, city staff, monitoring contractor.	$750,000	$350,000	$1,100,000	▪ Locations referred for cleanup. ▪ 100K fund to facilitate cleanups established. ▪ PCB and other pollutant loadings to the Bay reduced.[1]
4. Enhance municipal sediment removal and management practices.	BASMAA, city staff, monitoring contractor.	$400,000	$350,000	$750,000	▪ Enhanced municipal removal and management of sediment with pollutants. ▪ PCB and other pollutant loadings to the Bay reduced.[1]
5A. Urban runoff treatment retrofits - planning and design.	BASMAA, design consultant, city staff.	$550,000	$200,000	$800,000	▪ Conceptual/engineering design, planning and permitting of eight to ten urban runoff treatment retrofits.
5B. Urban runoff treatment retrofits - construction, operation and monitoring.	BASMAA, city staff, construction firms, monitoring contractor.	$3,200,000[2]	$200,000	$3,350,000	▪ Eight to ten urban runoff treatment retrofits installed and evaluated. ▪ An estimated 2 to 12 square miles treated by retrofits to reduce potential hydrologic impacts on downstream receiving waters. ▪ PCB and other pollutant loadings to the Bay reduced.[1]
6. Regional risk reduction program.	BASMAA (other partners may include CDPH, BACWA and WSPA).	$100,000	$100,000	$200,000	▪ Public education/outreach materials. ▪ Impacted populations will have a greater awareness and understanding of fish contamination issues and options for reducing exposures to pollutants in Bay fish.
7. Outreach and technology transfer.	BASMAA, consultant(s)	--	$150,000	$150,000	▪ Project web portal. ▪ Guidance manual. ▪ Written outreach materials. ▪ Technical workshops.
	TOTAL:	**$5,000,000**	**$1,840,000**	**$6,840,000**	

[1]All project activities combined are anticipated to reduce PCBs loadings about 0.3 - 1.5 kg/year.
[2]This figure assumes a 15% contingency will be built in to estimated construction costs.

CW4CB will yield a number of other important local and regional benefits, including:

- Providing residents, workers and visitors in the project watersheds with a safer and healthier environment (PCBs concentrations in sediment samples from Bay Area watersheds have sometimes exceeded screening levels for human direct exposure at sites within residential and commercial/industrial land uses).
- Enhancing the desirability of commercial enterprise zones and residential neighborhoods in the project watersheds.
- Increasing Bay Area urban acreage treated with infrastructure retrofits to remove pollutants and reduce hydrologic impacts on downstream receiving waters and thereby protect their beneficial uses.
- Reducing pollution in run-off from urban development and helping mitigate the impact of development on water quality.
- Informing future land use planning, development practices (e.g., low impact development), and efforts to investigate and abate sediment-bound pollutants in other urban watersheds, and thus leading to improvements in water quality and the environment in the Bay Area and other urban areas in California and the United States.

In summary, CW4CB is anticipated to realize significant and sustainable environmental benefits to Bay Area local communities, the region, and other urban communities in California and the United States that apply the lessons learned in this project.

5. Partnering and Budget Narrative

BASMAA is a well established regional partnership that focuses on water quality issues related to stormwater runoff. BASMAA is comprised of the nine municipal stormwater programs in the San Francisco Bay Area which in turn represent 96 agencies, including 79 cities and 6 counties. The jurisdictions of these agencies cover most of the watershed immediately surrounding San Francisco Bay. The BASMAA partnership facilitates the efficient use of public resources through regional information sharing, consistency, and cooperation.

BASMAA member agencies[5] comprise six of CW4CB's specific project partners. An additional potential partner, the Bay Area Clean Water Agencies (BACWA), is not part of BASMAA. BACWA is a joint public powers authority whose members include public utilities that collect and treat municipal wastewater from the nine Bay Area counties that surround San Francisco Bay. BACWA's partnership in CW4CB would focus on the regional risk reduction task described later.

BASMAA is requesting $5M in project funds from USEPA's San Francisco Bay Area Water Quality Improvement Fund towards the $6.84M total project cost. The remaining $1.84M (about 27% of the total project cost)[6] match will be comprised of contributions from project partners over the four year project term (Table 2). These contributions will be largely in the form of in-kind services. A

[5]These agencies are the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP), the Alameda Countywide Clean Water Program (ACCWP), the Contra Costa Clean Water Program (CCCWP), the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP), the Fairfield-Susuin Urban Runoff Management Program (FSURMP), and the Vallejo Sanitation and Flood Control District (VSFCD).
[6]Bay Area municipal agencies were able to commit to this $1.84M match despite the current difficult economic climate and budget shortfalls faced by many local agencies.

letter is attached from each of these agencies verifying the commitment to contribute to the project match.

Many of the project activities will take place within the Cities of San Carlos, San Jose, Oakland and Richmond. These cities have agreed to be additional project partners and, as described later, host project subwatersheds (support letters are attached), but are not making a specific financial commitment to the project. However, many of CW4CB's activities will be leveraged in that staff from these cities will assist with implementation of various aspects of the project fieldwork, as described in more detail later. The opportunity for future leveraging of some tasks is also anticipated through California's Proposition 84 Bond.

Table 1 summarizes the project tasks, implementing parties, and associated budgets, including how USEPA funding and the project match are apportioned to each task. It should be noted that Table 1 divides Task 5, Urban Runoff Treatment Retrofits, into subtasks A and B, with the budget itemized for each subtask. Subtask A covers planning and design, including preparing the documentation required to enable environmental review of the proposed retrofit projects under the California Environmental Quality Act (CEQA). Subtask B includes construction, operation/maintenance and monitoring.

BASMAA Agency		Contribution
SCVURPPP	$	570,000
ACCWP	$	500,000
CCCWP	$	285,000
SMCWPPP	$	240,000
FSURMP	$	45,000
VSFCD	$	40,000
BASMAA	$	160,000
Total:	$	1,840,000

Table 2. Non-Federal Match Contributions.

6. Scope of Work / Approach

The following sections describe CW4CB's seven project tasks. Table 3 summarizes the schedule of project milestones and deliverables. Figure 2 is a flow chart illustrating the interelationships among the tasks and associated sub-tasks.

Task 1. Management, Oversight, and Reporting

- **WQIF Funding:** $0. **Non-federal Matching Funds:** $460,000.
- **Key Tasks and Activities:** Project management, record-keeping, accounting, reporting, technical oversight of all project activities, and QAPP development.
- **Deliverables:** QAPP, quarterly progress reports and draft and final project report.

BASMAA will serve as CW4CB's prime contractor. On behalf of the BASMAA Board of Directors, the Principal Investigator (PI) will be Geoff Brosseau, BASMAA's Executive Director. He will be responsible for overall project management and all fiscal activities related to agreements with USEPA and sub-contractors. Mr. Brosseau will be assisted by a project management team consisting of representatives from several BASMAA agencies (i.e., stormwater management programs). One member of the team and BASMAA's technical lead on PCBs, Jon Konnan (SMCWPPP), will be the Project Manager (PM). The other members of the project management team will be: Chris Sommers (SCVURPPP), Arleen Feng (ACCWP), Jamison Crosby (CCCWP),

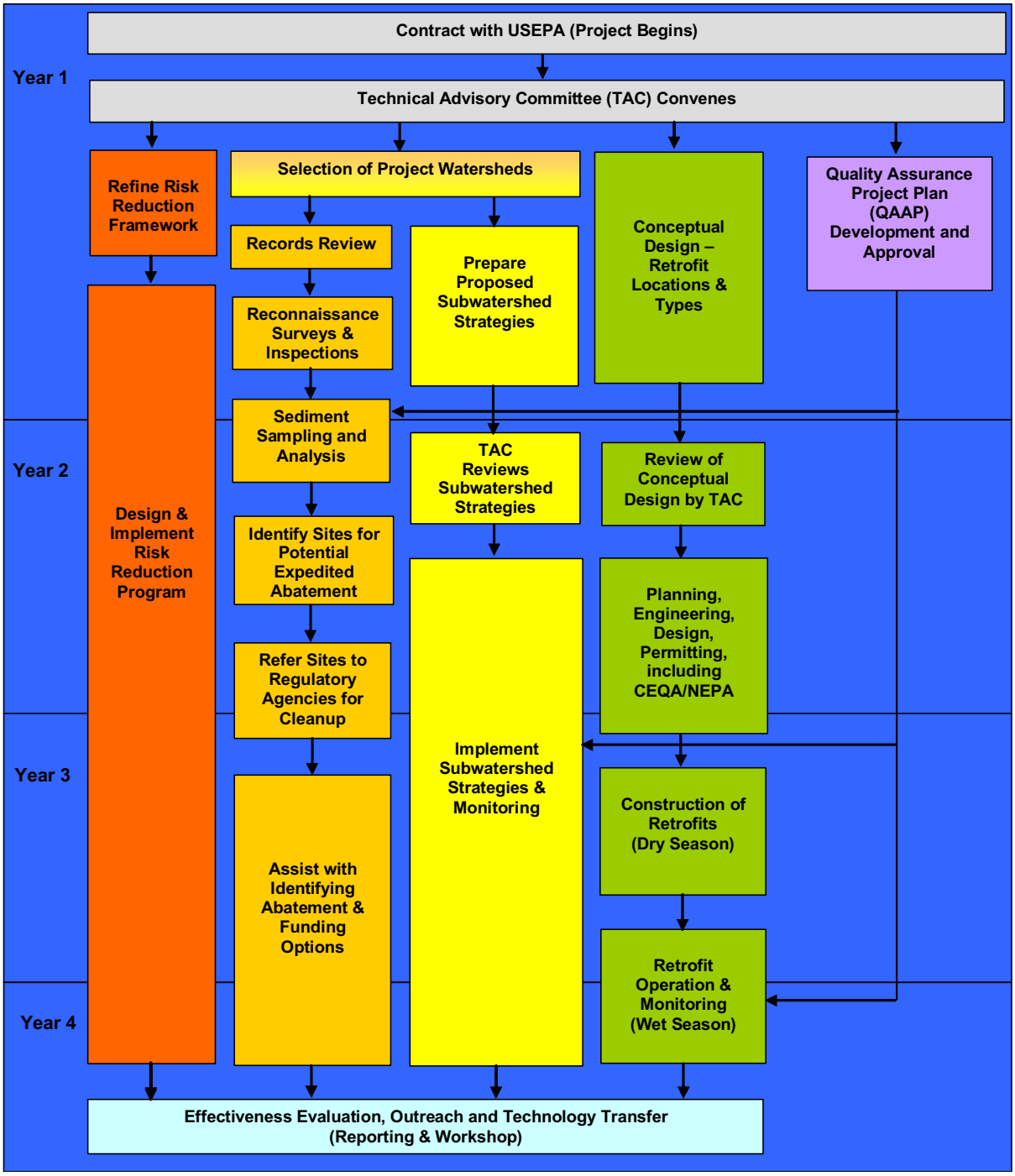

Figure 2. Flow Chart of Project Tasks

Table 3. Schedule of CW4CB Milestones and Deliverables

Project Milestones and Deliverables	Year 1				Year 2				Year 3				Year 4			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Task 1. Management, Oversight, and Reporting:																
Convene Technical Advisory Committee (TAC)	■															
Quarterly Progress Reports to USEPA	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
Draft Quality Assurance Project Plan (QAPP)	■															
USEPA Approval of QAPP			■													
Draft Project Report to USEPA															■	
Final Project Report to USEPA																■
Task 2. Select Project Subwatersheds:																
Review Existing Data & Select Subwatersheds	■															
Task 3. Identify Locations with Elevated PCBs and/or Mercury for Abatement:																
Records Review	■	■	■													
Reconnaissance Surveys & Inspections			■	■												
Sediment Sampling and Analysis				■	■											
Identify Sites for Potential Expedited Abatement						■	■	■	■							
Refer Sites to Regulatory Agencies for Cleanup						■	■	■	■							
Assist with Identifying Abatement & Funding Options						■	■	■	■	■	■	■	■			
Effectiveness Evaluation														■	■	
Task 4. Enhance Municipal Sediment Removal and Management Practices:																
Prepare Proposed Subwatershed Strategies	■	■	■	■	■											
Implement Subwatershed Strategies & Monitoring						■	■	■	■	■	■	■	■			
Effectiveness Evaluation														■	■	

Task 5. Urban Runoff Treatment Retrofits: *																
Conceptual Design - Retrofit Locations & Types	▮	▮	▮	▮												
Planning/Engineering Design/Permitting/CEQA					▮	▮	▮	▮								
Construction of Retrofits (Dry Season)									▮	▮						
Retrofit Operation & Monitoring (Wet Season)											▮	▮				
Effectiveness Evaluation													▮	▮	▮	
Task 6. Regional Risk Reduction Program:																
Convene a risk reduction stakeholder advisory group (SAG)	▮															
Develop a broad risk communication strategy		▮	▮	▮	▮	▮	▮	▮								
Award and oversee implementation of mini-grants					▮	▮	▮	▮	▮	▮	▮	▮	▮	▮		
Conduct evaluation activities														▮	▮	
Task 7. Outreach and Information Transfer:																
Develop and Update Project Web Portal	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮	▮
Develop Written Outreach Materials														▮	▮	
Develop Guidance Manual														▮	▮	
Technical Workshop																▮

* Note: Generic schedule; Actual schedules expected to vary by location.

and Kevin Cullen (FSURMP). The project management team will assist the PI and PM to ensure that all project activities are completed on-time and within budget by having specific responsibility for oversight of project activities within the jurisdiction of the BASMAA agency that they represent. BASMAA will consult with USEPA and contract with project consultants, contractors and construction firms. In addition, the project management team will coordinate with the project partners and key regional agencies for project activities within the jurisdiction of the BASMAA agency that they represent, including the Regional Water Board, and prepare quarterly progress reports and a draft and final project report. The project management team will also work closely and coordinate with key personnel from the project partners, including the following Bay Area city personnel: James Downing (City of San Jose), Robert Weil (City of San Carlos), Lesley Estes (City of Oakland), and Lynne Scarpa (City of Richmond).

Resumes are attached for the PI, PM, project management team members, and project partner key personnel.

At the outset of the project, BASMAA will convene a Technical Advisory Committee (TAC). The TAC will be tasked with providing the project with technical guidance and oversight, including key input on all major decision points (e.g., confirming the location of project subwatersheds and selecting and siting treatment retrofits) and reviewing and commenting on drafts of all project deliverables. The TAC will be comprised of Dr. Tom Mumley (Assistant Executive Officer, Regional Water Board) and other appropriate technical experts from the Bay Area and elsewhere in the United States.

During the first quarter of year one of the project (Table 3), a Quality Assurance Project Plan (QAPP) addressing the field monitoring in the below tasks will be developed and submitted to USEPA for approval. All specified field and laboratory sampling and Quality Assurance / Quality Control (QA/QC) protocols, data management methods, and reporting procedures will be compatible with the California Surface Water Ambient Monitoring Program (SWAMP) and the San Francisco Estuary Regional Monitoring Program (RMP).

Task 2. Select Project Subwatersheds

- **WQIF Funding:** $0. **Non-federal Matching Funds:** $30,000.
- **Key Tasks and Activities:** Implement pertinent data review and final selection of five project subwatersheds.
- **Deliverables:** Subwatershed selection documented in first quarterly progress report.
- **Outputs:** Five priority Bay Area subwatersheds identified.

CW4CB will include a program of pollution investigation and abatement in high priority Bay Area watersheds. The project will target urban subwatersheds with high potential for discharges of PCBs in urban runoff that is ultimately conveyed to the Bay. The project subwatersheds will include areas of current or historic industrial land uses where elevated levels of PCBs have been found in sediments collected from creeks, stormwater conveyances and roadway-related infrastructure. The selection of project subwatersheds will primarily focus on the presence of PCBs, which are often found in areas with industrial land uses dating back several decades, but mercury and other sediment-bound pollutants will likely be present in such locations. At the outset of the project, CW4CB will perform a comprehensive review of the existing data described earlier (Section 3), including the JSAP, follow-up stormwater program case study work, and sediment surveys

conducted by the SFEI Proposition 13-funded project. Based on the above review and input from the TAC, five project subwatersheds will be selected.

At the time of this application the Cities of San Carlos, San Jose, Oakland and Richmond have agreed to host project subwatersheds (support letters are attached). Most or all of the project subwatersheds will be located in these cities. Examples of candidate subwatersheds are described below.

Pulgas Creek Pump Station Subwatershed, San Carlos

The Pulgas Creek pump station subwatershed is located in the City of San Carlos in San Mateo County. San Carlos has agreed to host one of the five project subwatersheds and this subwatershed will likely be selected. Much of the land use within this approximate 0.5-square mile subwatershed has been industrial dating back several decades. PCBs have been detected at up to about 11 parts per million (ppm) in embedded storm drain and creek sediment samples collected from the pump station sump and its drainage. Based on the results of field sampling and agency research, two potential sources of PCBs to storm drains in the study area were identified: a PG&E substation and a soil and groundwater investigation and remediation site with PCBs and other pollutants. Investigations to date also suggest multiple unidentified sources of PCBs in the study area, given the widespread spatial distribution of PCBs found in storm drain sediments.

Ettie Street Pump Station Subwatershed, Oakland

The Ettie Street pump station subwatershed is located in the City of Oakland in Alameda County. Oakland has agreed to host one of the five project subwatersheds and this subwatershed may be selected. This approximate 2.5-square mile subwatershed includes residential, commercial, and industrial land uses. As part of a state-funded water quality grant project, Oakland has performed visual inspections of public and private properties in this subwatershed and sampling of sediments and soils. PCBs have been found at concentrations up to about 93 ppm in sediments and soils collected from the pump station sump and other locations throughout the subwatershed.

Leo Avenue Subwatershed, San Jose

The Leo Avenue subwatershed is located in the City of San Jose in Santa Clara County. San Jose has agreed to host one of the five project subwatersheds and this subwatershed is under consideration. Land uses in the subwatershed are primarily commercial and industrial. Relatively elevated levels of PCBs (up to about 20 ppm) have consistently been found in the Leo Avenue area. The spatial distribution of PCBs concentrations coupled with an analysis of PCBs homolog distributions suggested that the Union Pacific railroad track right-of-way adjacent to Leo Avenue is a source of PCBs in this subwatershed. Other potential PCB sources include historical activities at other properties adjacent to Leo Avenue.

North Richmond Pump Station Subwatershed, Richmond

The North Richmond Pump Station subwatershed is located in the City of Richmond in Contra Costa County. The City of Richmond has agreed to host one or two of the five project subwatersheds and this area is under consideration. The drainage area of this subwatershed is about 0.5 square miles and includes a variety of land uses. The City of Richmond recently embarked on a planning effort to identify target pollutants in city stormwater, identify priority watersheds within the city, identify likely sources of pollutants, and identify potential control mechanisms for these

pollutants. The primary pollutants of concern in this subwatershed are PCBs and mercury, which are likely present due to a long history of industrial activity in the area. Concentrations of PCBs found in sediment have ranged up to about 1 ppm.

Santa Fe Channel Subwatershed, Richmond

Another subwatershed under consideration in Richmond is the Santa Fe subwatershed. This approximately 2.3 square mile watershed includes a variety of land uses and has historical PCBs and mercury contamination. The City of Richmond has selected the Sante Fe subwatershed as a priority watershed and concentrations of PCBs in sediment have ranged up to about 2 ppm in industrial areas.

Task 3. Identify Locations with Elevated PCB and/or Mercury Concentrations for Abatement

- **WQIF Funding:** $750,000. **Non-federal Matching Funds:** $350,000.
- **Leveraged Resources:** City staff will assist with site inspections and other aspects of the fieldwork. Site cleanups will be overseen by appropriate regulatory agencies and implemented by responsible parties or with other available funding.
- **Key Tasks and Activities:** Implement review of existing data and field inspections and monitoring to identify locations with elevated PCB concentrations within project subwatersheds, refer sites to regulatory agencies for cleanup, and establish fund to facilitate site cleanups.
- **Deliverables:** Results documented in quarterly progress reports and draft and final project report.
- **Outputs:** Properties/locations with elevated PCBs and potentially mercury and other pollutants identified and referred to regulatory agencies for cleanup and fund to facilitate cleanups established.
- **Outcomes:** PCB and mercury loadings to San Francisco Bay reduced.

This task focuses on identifying specific locations and properties within the project subwatersheds that are potential sources of PCBs and/or mercury to stormwater conveyances. One model for this task is a recent project conducted by the City of Oakland through a Proposition 13 grant in the amount of $460,000 awarded by the California State Water Resources Control Board. The project focused on identifying sources of PCB-containing sediments to the storm drain system in the Ettie Street Pump Station subwatershed in Oakland. Based on the Ettie Street project, CW4CB will conduct the below steps at each project subwatershed, adapting and refining these methods as appropriate to local conditions.

1. **Records Review**. CW4CB will interview local and state agency staff and review local and state databases and information sources (e.g., Geotracker, SLIC, Cerclis, and Vistacheck.com), appropriate agency files (e.g., local environmental/health department data, local fire department hazardous material records, and facility inspection and illicit discharge records), and other readily available information, as appropriate (e.g., land use records, historical aerial photographs, reverse telephone directories, Sanborn Fire Insurance Maps, and transformer locations requested of PG&E) to identify potential PCB/mercury source properties and areas where PCB/mercury contaminated sediment accumulates within each of the project subwatersheds, including within stormwater conveyances. To the extent practicable, appropriate records on all businesses in each subwatershed will be screened.[7] Potential PCB/mercury source areas in each subwatershed will be identified and given a preliminary priority ranking.

2. **Driving/Walking Survey.** CW4CB will work with municipal staff to perform a driving/walking survey of the entire area of each project subwatershed to identify properties that are high priority for site inspections. The survey will build upon the results of the above records review to further identify potential source areas and determine whether runoff from such locations is likely to convey soils/sediments with PCBs or mercury to municipal stormwater conveyances. Based on criteria developed during the Ettie Street project, examples of potential high priority sites include:
   - Previously identified PCB spill site.
   - Historic land use associated with PCB-containing materials.
   - Potential for soils/sediments to erode and migrate off-site, including unpaved areas.
   - Sites with outdoor storage yards and storage tanks.
   - Sites with poor housekeeping.

3. **Site Inspections.** CW4CB will work with municipal staff to perform inspections of selected high priority sites within each project subwatershed. Inspectors will use a checklist developed for Ettie Street project regarding priority uses and activities potentially associated with PCBs, adapted as appropriate for this project. Inspected sites will then be ranked for further investigation, including the below soil/sediment sampling, using criteria developed during the Ettie Street project, adapted for this project as appropriate.

4. **Sediment/Soil Sampling.** CW4CB will test for elevated PCB/mercury concentrations through surface sediment/soil sampling and analysis where visual inspections and/or other information suggest potential source areas within each subwatershed. As with the Ettie Street project, sampling will occur on both the public right of way and private properties. It is anticipated that the process of reconnaissance/inspections and sediment sampling will be iterative in many cases to hone in on source areas in the most cost-effective manner. CW4CB will collect and analyze approximately 70 soil/sediment samples from each of the five project subwatersheds, a number of samples comparable with the Ettie Street project on a per subwatershed basis. Based on 350 samples analyzed for PCBs, total mercury, total organic carbon and particle size distribution (and ten percent of these samples analyzed for the following additional analytes: dioxins, PBDEs, legacy chlorinated pesticides, and PAHs), the total estimated laboratory analysis cost is $366,000.

[7]This is an extensive task (e.g., the Ettie Street Pump Station subwatershed had approximately 1,700 businesses).

5. **Site Referrals.** Where laboratory data confirm significantly elevated PCB/mercury concentrations in surface sediments/soils, available information on current site conditions and owner/operators and other potentially responsible parties will be provided to the Regional Water Board. The Regional Water Board is a state regulatory agency with investigation and cleanup authorities to facilitate issuance of orders for further investigation and remediation of the subject sites.[8] The Regional Water Board may refer sites to other regulatory agencies if appropriate (e.g., Department of Toxic Substance Control, USEPA). CW4CB will also provide Regional Water Board staff with general assistance in evaluating abatement options and identify funding sources for abatement. In addition, CW4CB will identify areas within the project subwatersheds for potential expedited abatement on the basis of loading potential including factors such as PCB concentration, mass of sediment, and mobilization potential and/or human health protection thresholds, such as California Human Health Screening Levels. CW4CB will set aside a budget of $100,000 for technical services to facilitate priority site cleanups as needed on a case by case basis (e.g., further identification of cleanup funding sources, additional history/records research, additional sampling and analysis, communications, other activities as needed to move the cleanup process forward).

To evaluate the effectiveness of this task, CW4CB will assess the available data on the effectiveness of the abatement activities at specific properties/locations within the project subwatersheds and quantitatively estimate the resulting reduction in loads of PCBs (and mercury where applicable) to the Bay. The results of the effectiveness evaluation will be reported in the progress reports as data become available and summarized in the draft and final project report. It is anticipated that the efforts described in this task will be highly leveraged since the cleanups of the identified source areas will be funded outside of this project, including oversight by appropriate regulatory agencies (most likely state agencies) and implementation by responsible parties or with other available funding (e.g., California Cleanup and Abatement Account). In addition, city staff will assist with implementation of the fieldwork, further leveraging this task's efforts.

Task 4. Enhance Municipal Sediment Removal and Management Practices

- **WQIF Funding:** $400,000. **Non-federal Matching Funds:** $350,000.
- **Leveraged Resources:** City staff will assist with implementation of the fieldwork and sediment management enhancements put into place will likely continue in the project subwatersheds (and expand to other locations) into the future.
- **Key Tasks and Activities:** Preparation of subwatershed-specific strategies to enhance the pollutant load reduction benefits of municipal operation and maintenance activities; implementation of the strategies in the field in the project subwatersheds.
- **Deliverables:** Subwatershed-specific strategies report; implementation results documented in quarterly progress reports and draft and final project report.
- **Outputs:** Enhanced removal of sediment with PCBs and other pollutants during municipal sediment removal and management activities.
- **Outcomes:** PCB and mercury loadings to San Francisco Bay reduced.

[8]The point of contact with the Regional Water Board will be Janet O'Hara, the Regional Water Board Staff currently tasked with implementation of the San Francisco Bay PCBs TMDL.

In the project subwatersheds, CW4CB will evaluate ways to enhance the PCB, mercury, and other pollutant load reduction benefits of municipal operation and maintenance activities that remove or manage sediment. The evaluation will include working with city staff to enhance sediment-bound pollutant removal during municipal activities such as street sweeping, storm drain inlet and catch basin cleaning, stormwater conveyance maintenance, and pump station maintenance. The evaluation will include consideration of street flushing (potentially with recycled water) and capture, collection, and/or routing to the local sanitary sewer. Simple removal of sediments from gutters and storm drains will also receive consideration. CW4CB will work with city staff to prepare a written strategy for implementing enhancements in each project subwatershed. The TAC will review the subwatershed-specific strategies and provide key input and recommendations to the project management team before the fieldwork to implement enhancements commences.

To evaluate the effectiveness of this task, CW4CB will collect and analyze appropriate sediment samples to inform a quantitative estimation of how the enhanced sediment removal and management activities reduce loads of PCBs (and mercury as applicable) to the Bay. The results of the effectiveness evaluation will be reported in the progress reports as data become available and summarized in the draft and final project report.

The efforts described in this task will be leveraged in that city staff will assist with implementation of the fieldwork. It is also anticipated that these efforts will be leveraged into the future in that the sediment management enhancements put into place and the associated pollutant load reductions will likely continue in the project subwatersheds (and expand to other locations) after the four year project period.

Task 5. Urban Runoff Treatment Retrofits

- **WQIF Funding:** $3,750,000. **Non-federal Matching Funds:** $400,000.
- **Leveraged Resources:** City staff will assist with aspects of siting, designing, installing and operating/maintaining the retrofit facilities and operation/maintenance of the retrofits will likely continue into the future. During retrofit conceptual design CW4CB will leverage BACWA's study on the feasibility of diverting stormwater to wastewater treatment plants.
- **Key Tasks and Activities:** Implementation of retrofits, including conceptual design (retrofit locations and types); planning/design/permitting/CEQA; construction of retrofits (dry season); operation and monitoring (wet season); effectiveness evaluation.
- **Deliverables:** Conceptual design report (retrofit locations and types); implementation results documented in quarterly progress reports and draft and final project report.
- **Outputs:** Installation of eight to 10 urban runoff treatment retrofits.
- **Outcomes:** PCB and mercury loadings to San Francisco Bay reduced and an estimated two to twelve square miles treated by retrofits to reduce potential hydrologic impacts on downstream receiving waters.

CW4CB will retrofit urban runoff treatment systems into existing MS4s at selected sites in the Bay Area urban landscape to intercept pollutants before they can enter San Francisco Bay. Solids removal is generally the most feasible option to treat PCBs and other sediment-bound pollutants in stormwater runoff. Stormwater treatment structures that remove solids commonly rely on sedimentation, filtration, flow through separation, or some combination of these processes. These

technologies are readily available and can effectively remove sediment and associated pollutants when properly designed, installed, operated and maintained (CASQA 2003).

CW4CB will identify eight to 10 locations throughout the Bay Area that present opportunities to retrofit treatment systems and assess the best retrofit options for each location. If CW4CB evaluates 10 retrofits, up to two of these may be existing retrofits, provided they meet all project goals. Retrofit locations will be selected primarily on the basis of elevated PCBs concentrations with additional consideration given to mercury concentrations. Options considered for types of retrofits will include detention basins, media filtration structures (e.g., sand filter), bioretention units, infiltration basins, constructed wetlands, and diversions from stormwater pump stations to existing domestic wastewater treatment plants.[9]

The planning of stormwater treatment retrofitting is potentially complex and will be carried out in a watershed context primarily during year one of the project (Table 3). To the extent feasible, Low Impact Development principles will be considered to reduce potential hydrologic impacts on downstream receiving waters (e.g., tidal portions of creeks, sloughs, and wetlands) and thereby protect related beneficial uses, habitat and ecosystems. The evaluation will consider technical and economical feasibility, taking into consideration that siting of some technologies may be limited by factors such as soil types, groundwater elevation, slopes, insect breeding and space constraints. In addition, in some cases treatment structure design may need to account for minimizing mercury methylation. The evaluation will include GIS spatial analysis and ground-truthing of potential sites and will consider appropriate locations both within and outside of the project subwatersheds discussed previously. The final selections will span treatment types and Bay Area watershed characteristics. A conceptual design report with proposed retrofit locations and types will be prepared with input and recommendations from the TAC.

Engineering design and permitting, including local agency approval, is anticipated to occur primarily during year two of the project. As required and appropriate, CW4CB will also prepare the documentation required to enable environmental review of the proposed retrofit projects under the California Environmental Quality Act (CEQA). It is anticipated that the environmental review under CEQA will not require developing an Environmental Impact Report (EIR) and at most initial studies with mitigated negative declarations will be sufficient.

We anticipate that the retrofits will be constructed during the dry season of the third year of the project and operation and evaluation of the retrofits will span the wet season between years three and four. Retrofit influent and effluent sampling and analysis data will be collected to evaluate and quantify the removal of PCBs, mercury, and other pollutants. The results of the effectiveness evaluation will be reported in the progress reports as data become available and summarized in the draft and final project report. The efforts described in this task will be leveraged in that city staff will assist with aspects of siting, designing, installing and operating/maintaining the retrofit facilities. It is also anticipated that these efforts will be leveraged into the future in that the operation/maintenance of the retrofits and the associated pollutant load reductions will likely continue after the four year project period.

[9]The Bay Area Clean Water Agencies are currently preparing a "white paper" that will evaluate existing data to describe the feasibility of diverting stormwater to wastewater treatment plants in the Bay Area. CW4CB will leverage this effort by reviewing the results of the evaluation during retrofit conceptual design.

Task 6. Regional Risk Reduction Program

- **WQIF Funding:** $100,000. **Non-federal Matching Funds:** $100,000.
- **Key Tasks and Activities:** Stakeholder advisory group convened; broad risk communication strategy developed; mini-grants awarded and implementation overseen; evaluation activities conducted.
- **Deliverables:** Broad risk communication strategy developed, mini-grant program documented and evaluated in quarterly progress reports and draft and final project report.
- **Outputs:** Public education outreach materials.
- **Outcomes:** Impacted populations will have a greater awareness and understanding of fish contamination issues and options for reducing exposures to pollutants in Bay fish.

Fish caught in San Francisco Bay have elevated levels of harmful chemicals, including mercury and PCBs. The current health advisory recommends limiting consumption of most Bay fish to no more than two meals per month. For high risk groups (pregnant and breastfeeding women, and children) only one meal per month is advised. The San Francisco Bay Seafood Consumption study showed that approximately two-thirds of people fishing in the Bay had limited understanding or no awareness of the health advisory. This study also showed that the consumption patterns among certain ethnic groups results in higher exposure to contaminants in Bay fish. CW4CB will implement a regional program of risk communication activities to raise public awareness of fish contamination issues in San Francisco Bay and to encourage fish-consuming populations to reduce their exposure to pollutants in contaminated fish. BASMAA may partner with the Bay Area Clean Water Agencies (BACWA) and other agencies to perform this task. Based on consultations with the California Department of Public Health (CDPH), the risk reduction task will consist of the following four sub-tasks.

Sub-task 1. Convene a risk reduction stakeholder advisory group (SAG)
CW4CB will initiate a stakeholder process to bring together local groups and organizations that are interested in seeking ways to reduce exposures to chemicals in contaminated fish. We will reach out to a broad range of stakeholders for participation on the SAG, including, but not limited to, community-based, social services, watershed, fishing, environmental justice, and parks organizations, as well as state and local agencies. The objective of the SAG will be to create, inform, and guide the development of a risk communication strategy (Task 2). In addition, CW4CB will use the SAG meetings to solicit general input on the objectives of the mini-grants program (Task 3), to keep members updated on the progress of the mini-grants and related activities (e.g., fish monitoring activities, Bay PCBs TMDL, new San Francisco Bay fish consumption advisory), and encourage new activities and collaborations among the participating groups (e.g., sign posting by fishing location managers).

Sub-task 2. Develop a broad risk communication strategy
CW4CB will work closely with the SAG to develop a broad risk communication strategy that will serve as the basis for planning future outreach, education, and risk reduction activities. The strategy will address how to communicate information about fish contamination issues, including the current advisory, to fish consuming populations, with an emphasis on those populations at greatest risk. The risk communication strategy that was used in the CALFED-funded Fish Mercury Project risk

reduction project in the Central Valley and Sacramento/San Joaquin Rivers watershed will be used as a model, but tailored by the SAG for the purpose of this project. The strategy will describe the target populations, the key messages that will be communicated, the types of future activities that would be most effective to reach these target populations (e.g., focused community/population-specific mini-grants, broader-based education efforts through established non-profit education centers), and methods for evaluating the effectiveness of these activities. The strategy will be updated as relevant and critical information becomes available, including a new fish consumption advisory for San Francisco Bay that the Office of Environmental Health Hazard Assessment plans to issue in 2010. One important component of the strategy will be a mini-grant program (Task 3) to engage some of the SAG members in implementing outreach, education, or risk reduction projects in the short term.

Sub-task 3. Award and oversee implementation of mini-grants

It is important to begin engaging local organizations regarding implementing outreach, education, and risk reduction activities concurrent with developing the broad risk communication strategy (Task 2). Local organizations may already have close relationships with communities who consume Bay fish and be able to address language and cultural barriers. CW4CB will develop a process to select and award small grants for local organizations to conduct these projects. We will seek input from the SAG to guide the general goals of the mini-grant program and seek SAG participation on the selection panel. Based on the needs of the funded groups, CW4CB may, as needed, conduct limited capacity building trainings on topics related to fish contamination (e.g., mercury health impacts, advisories) and help the groups to develop the skills needed to implement their projects. CW4CB will also monitor their progress and assist with evaluation and reporting requirements.

Sub-task 4. Conduct evaluation activities

Evaluation activities will include the following parts: evaluation of the SAG; mini-grant evaluation activities by the funded groups; CW4CB evaluation of mini-grants; and potentially evaluation of other broader-based education efforts through established non-profit education centers conducted in association with CW4CB. CW4CB will conduct evaluation of the SAG process, focusing on process indicators (e.g., who attends SAG meetings, what input they provide, how they guide strategy development). Broader feedback will also be solicited on whether the SAG is meeting its goals, the SAG activities that were most helpful to members, and ways the SAG could be improved. Mini-grant funded groups will implement an evaluation of their mini-grant project activities. CW4CB will provide guidance on how to conduct these evaluations. Evaluation will most likely focus on process indicators, such as the number of people who were reached by their mini-grant project activities or the number of materials distributed. CW4CB will also provide an evaluation summary that describes evaluation activities across funded groups. The evaluation summary will also include input from funded groups on their overall experience in the mini-grant program and how it could be improved, and grantee feedback on how their mini-grant activities will be sustained after the mini-grant funding ends.

Task 7. Outreach and Technology Transfer

- **WQIF Funding:** $0. **Non-federal Matching Funds:** $150,000.
- **Key Tasks and Activities:** Development of project web portal, written outreach materials, and project guidance manual; technical work shops.
- **Deliverables:** Results documented in quarterly progress reports and draft and final project report.
- **Outputs:** Project web portal, guidance manual, written outreach materials, technical workshops.

CW4CB will document the knowledge and experience gained and the lessons learned during this project. The goal will be to make information and guidance readily available to inform future efforts to mitigate urban runoff discharges of PCBs and other pollutants from other urban watersheds in the Bay Area and elsewhere in California and the United States. This task will promote the use of project results by others and will result in the public and professionals in the field being informed and engaged. CW4CB's methods and tools to facilitate outreach and information transfer will include the following:

- A project web portal will be developed at the outset of project and updated quarterly throughout the project term.
- A guidance manual will be prepared that provides essential information to others that wish to implement similar efforts.
- Written outreach materials will be developed, including a user-friendly summary of the project with references to where additional information is available (e.g., the web portal and guidance manual). The urban runoff treatment retrofits will be publicized and presented as demonstration projects.
- A technical workshop will be held covering all aspects of the project.

As feasible and appropriate, the monitoring data from this project (especially the urban runoff treatment retrofit monitoring) will be submitted for inclusion in the International Stormwater BMP Database.

7. Programmatic Capability and Past Performance

The Bay Area Stormwater Management Agencies Association was established in 1989 as a regional association through a memorandum of understanding (MOU) covering the nine Bay Area counties. BASMAA was started by local municipalities to facilitate information sharing and cooperation and to develop products and programs that would assist them in meeting their NPDES permit and Clean Water Act requirements. BASMAA is designed to encourage information sharing and collaboration and it provides an institutionalized mechanism for its member agencies to develop innovative products and programs that are more cost-effective done regionally than can be accomplished locally.

BASMAA is focused on regional challenges and opportunities to improving the quality of stormwater that flows to our local creeks, San Francisco Bay and Delta, and the Ocean. BASMAA's work covers the full breadth of stormwater-related topics including monitoring, new

development, public information / participation, commercial / industrial, illicit discharges, flood control, TMDLs, and permitting.

Currently, BASMAA is a consortium of nine San Francisco Bay Area municipal stormwater quality programs, comprised of 96 Bay Area agencies (municipalities, counties, and special districts). Each BASMAA member agency plays a significant role in managing stormwater and urban runoff within its jurisdiction and in coordination with others in our region in order to protect the health of waters and aquatic life of Bay Area watersheds that drain into the region's six USEPA-identified sub-basins: Suisun Bay, San Pablo Bay, Coyote Creek, San Francisco Bay, Tomales-Drake Bays, and San Francisco Coastal South.

For the past 20 years, BASMAA has provided a forum for agencies with common interests, challenges, and responsibilities to collaborate on stormwater management issues of mutual interest and needs. Though its organizational framework has evolved from an assortment of agencies bound together by an MOU to the 501(c)(3) nonprofit entity it is today, BASMAA has continued to help its members by promoting understanding of existing and emerging stormwater quality management issues and technologies, facilitating agency cooperation, increasing program efficiency and effectiveness, and advancing sustainable stormwater quality management approaches in executive and legislative decision-making and public debate. Through BASMAA, stormwater quality management programs have been able to address regional, partnership, and locally specific needs as set forth in NPDES stormwater management permits issued by the Regional Water Board.

BASMAA committees and work groups have overseen the completion of numerous collaborative regional projects contracted to its agencies or consultants under its baseline and tasks of regional benefit budgets.[10] BASMAA's new challenge and opportunity is to assist its member stormwater quality management programs and their constituent agencies to work with the Regional Water Board on the finalized version of a municipal regional stormwater permit (MRP) that addresses watersheds in the Bay Area, and to foster collaboration and mutual assistance on implementation of MRP provisions. For the past twenty years, BASMAA and its participating entities have proven their capacity to collaborate on significant projects of regional importance, and have produced deliverables and outcomes that provide much of the foundation for current regional stormwater quality management efforts, including this proposal. BASMAA fully expects to continue to deliver the same quality of project capacity and success its members have achieved through collaborative association.

Some Major BASMAA Regional Projects

- Recognized Surface Cleaner program (1996 -)
- Construction site inspection / education program (1990s)
- Regional Advertising Campaigns (1996 -)
- Brake Pad Partnership (1996 -)
- *Start at the Source* design manuals (1997, 1999)
- IPM Partnership /*Our Water, Our World* program (1998 -)
- Joint Stormwater Agency Project to Study Urban Sources of Mercury, PCBs, and Organochlorine Pesticides (2001-'03)
- Bay Are Hydrology Model (BAHM) (2003)

[10] For additional capacity documentation, see Attachments Section for key staff resumes and the BASMAA Baseline Budget Projects and Programs Report.

In addition to the tens of projects and programs started and sustained by BASMAA using millions of dollars in funds from its members and other agencies over the years, BASMAA has received and conducted one USEPA grant project: the *Our Water, Our World Promotion — Statewide Expansion and Evaluation*; funded through a Pesticide Environmental Stewardship Program (PESP) grant through the National Foundation for IPM Education. Although the grant amount was relatively small ($40,000), the actual tasks were significant, including using some of the grant monies to leverage the existing *Our Water, Our World* Program in the Bay Area to expand the program statewide by recruiting tens of agencies outside of the Bay Area to start and support the program in their jurisdictions. The other key aspect of the grant was the development and implementation of a program evaluation to evaluate the effectiveness of the *Our Water, Our World* Promotion through direct performance measurement of store customers and to make recommendations for future efforts[11].

[11] See Attachments section for Final PESP Grant Compliance Report.

A3

MEMORANDUM

TO: **CW4CB Project Management Team**

FROM: **Kristin Kerr and Jon Konnan, EOA, Inc.**

DATE: **September 13, 2010**

SUBJECT: **Clean Watersheds for a Clean Bay (CW4CB) Project Status**

1.0 INTRODUCTION

This memorandum presents the status of Clean Watersheds for a Clean Bay (CW4CB), a new project funded by a grant to the Bay Area Stormwater Management Agency Association (BASMAA) from the United States Environmental Protection Agency (EPA).[1] It was prepared to address the 2010 reporting requirements for portions of Provisions C.11 and C.12 (described below) of the regional stormwater NPDES permit adopted October 14, 2009 by the San Francisco Bay Area Regional Water Quality Control Board (Regional Water Board), which is commonly referred to as the "Municipal Regional Permit" (MRP).[2]

The CW4CB project is a partnership of Bay Area municipalities and countywide municipal stormwater management programs. The overarching project objective is to implement priority actions called for by the San Francisco Bay PCBs and mercury Total Maximum Daily Load (TMDL) water quality restoration programs[3] including developing and pilot-testing a variety of methods to potentially reduce urban runoff loading of PCBs and mercury to the Bay. The project work plan (BASMAA 2010) submitted to EPA on September 23, 2009 (the final revised version is dated April 19, 2010) describes the project's principal tasks:

- Selecting for pilot investigations five Bay Area region watersheds with relatively high levels of PCBs[4] in sediments collected from roadway and stormwater drainage infrastructure and other desirable attributes;
- Identifying PCB and mercury source areas within the pilot watersheds and referring these sites to regulatory agencies for cleanup and abatement;
- Developing and pilot-testing methods to enhance removal of sediment with PCBs and mercury, mainly during existing municipal street and storm drain system operation and maintenance activities in the five pilot watersheds;
- Retrofitting eight to ten urban runoff treatment facilities into existing infrastructure in the Bay Area region to remove PCBs and mercury; and

[1]Funding is provided through EPA's San Francisco Bay Water Quality Improvement Fund.
[2]National Pollutant Discharge Elimination System (NPDES) Permit No. CAS612008, Order R2-2009-0074.
[3]The MRP implements the TMDL actions related to stormwater runoff.
[4]Per the MRP, "Reducing loads of PCBs is the main pilot location selection factor...and reducing loads of mercury is a secondary criterion."

- Facilitating development and implementation of a Bay Area regional exposure reduction program that focuses on educating the public about the health risks of consuming certain species of Bay fish that contain relatively high levels of PCBs and mercury.

The successful project outcome will contribute to developing a comprehensive regional strategy for reducing PCB and mercury loads in urban runoff, based on the cost-effectiveness of a range of pollutant control strategies, including pollution prevention, site remediations, enhanced sediment management, stormwater treatment retrofits, and diversion of stormwater to existing publicly owned treatment works (POTWs).[5] The knowledge and experience gained and the lessons learned during the CW4CB project will inform similar efforts by others in the Bay Area and elsewhere in California and the United States.

The anticipated project period is four years, beginning July 1, 2010. BASMAA is receiving $5.0 million in funding from the EPA toward the $6.84 million total project cost. The remaining $1.84M (about 27% of the total project cost) is matching funding contribution from BASMAA and six of the Bay Area countywide stormwater management programs. In addition, in-kind assistance from participating city staff will leverage the project effort.

A project management team consisting of BASMAA's executive director and representatives from several BASMAA countywide programs and Bay Area cities is providing project oversight and coordination. The team recently began meeting regularly on the second Wednesday of each month.

CW4CB is also convening a Technical Advisory Committee (TAC) comprised of local and national experts. The TAC will help optimize the scientific and technical soundness, integrity, and objectivity of the project. It will be comprised of Dr. Tom Mumley (Assistant Executive Officer, Regional Water Board), Dr. Lester McKee (Director of the Watershed Program, San Francisco Estuary Institute), and other appropriate technical experts from the Bay Area and elsewhere in the United States. CW4CB project management team members have conducted initial discussions with the existing two TAC members regarding finding additional members and have prepared a draft scoping document and a list of questions to ask when interviewing candidate additional members. Per the initial discussions, the project will seek to find TAC members with experience related to implementation of stormwater controls targeting particulate-bound pollutants in highly urbanized built-out industrial areas where available land is often sparse. Per Table 3 of the CW4CB project work plan, the schedule for initially convening the TAC is during the first quarter of the project (see Task 1).

The project work plan includes seven major tasks, several of which are intended to directly assist Permittee compliance with specific MRP provisions. These tasks and the corresponding provisions are as follows:

- <u>CW4CB Tasks 2 and 3</u> (MRP Provisions C.11/12.c - Pilot Projects to Investigate and Abate Mercury/PCB Sources).
- <u>CW4CB Task 4</u> (MRP Provisions C.11/12.d - Pilot Projects to Evaluate and Enhance Municipal Sediment Removal and Management Practices).
- <u>CW4CB Task 5</u> (MRP Provisions C.11/12.e - Pilot Projects to Evaluate On-Site Stormwater Treatment via Retrofit).

[5]Pollution prevention and stormwater diversion to POTW strategies are being developed and pilot-tested separately from CW4CB.

- CW4CB Task 6 (MRP Provisions C.11/12.i - Development of a Risk Reduction Program Implemented throughout the Region).

The following sections in this memorandum describe progress to-date on each of the above CW4CB tasks and corresponding MRP provisions and the schedule for moving forward. It should be noted that although CW4CB's conceptual planning and discussion began in early 2010, the actual project start date was July 1, 2010.[6]

2.0 PILOT PROJECTS TO INVESTIGATE AND ABATE MERCURY/PCB SOURCES

Provisions C.11/12.c. of the MRP require that Permittees work collaboratively to review pertinent existing data and identify five Bay Area watersheds that contain relatively high levels of PCBs and mercury (CW4CB Task 2) and conduct pilot projects to investigate and abate these pollutants (CW4CB Task 3). The CW4CB project management team is developing selection criteria and is currently working with Permittees towards selecting the five pilot watersheds by reviewing and evaluating relevant existing data.

Table 1 summarizes the proposed criteria that will inform selection of the five watersheds and the associated existing data sources. Most of these data were originally compiled and made available by the Regional Stormwater Monitoring and Urban BMP Evaluation Project conducted by the San Francisco Estuary Institute (SFEI) and referred to as the "SFEI Proposition 13 Study." The study investigated options for better managing mercury and PCBs in urban stormwater and was conducted in collaboration with BASMAA and the Regional Water Board. It was funded through a grant from the State of California Proposition 13 stormwater non-point-source program. SFEI recently completed the study and is currently updating a web site that will make the project data and results readily available.

The CW4CB project management team is currently working with SFEI to perform a GIS analysis of the SFEI Proposition 13 Study data to inform pilot watershed selection. The available data types include: watershed boundaries; spatial (including clustering) and temporal aspects of concentrations of PCBs and mercury in sediments; potential pollutant source sites (e.g., pollutant spill sites, PG&E facilities,[7] transformers with PCBs registered with the EPA, auto dismantlers, and historic railroads); historic land use; and pump station locations.

MRP Provisions C.11/12.d. require that Permittees work collaboratively to develop and pilot-test methods to enhance removal of sediment with PCBs and mercury during existing municipal street and storm drain system operation and maintenance activities. Permittees are required to conduct this pilot work in the five pilot watersheds selected for Provisions C.11/12.c. Thus the pilot watersheds will be located in areas where such municipal operation and maintenance activities are conducted routinely.

[6]The project started significantly later than originally anticipated. EPA's original Request for Proposal included an anticipated award date of February 2010. However, despite EPA's and BASMAA's best efforts to expedite the process, EPA was not able to provide BASMAA with a proposed assistance agreement until June 2010, resulting in the project start date of July 1, 2010. Thus the project is currently at an early stage.
[7]CW4CB currently does not have permission to use PG&E facility data but is working with Regional Water Board staff and SFEI to obtain that permission.

Table 1. Summary of Proposed Criteria to Inform Pilot Watershed Selection and Associated Data Sources

Category	Criterion	Data Sources
Benefits - Potential Pollutant Load Reductions	Are there relatively high levels of PCBs (and secondarily mercury) in sediments collected from roadway and stormwater drainage infrastructure in the watershed?	SFEI Proposition 13 Study compilation of sediment chemisty data.
	Are there other indicators of potential sources of PCBs in the watershed?	• SFEI Proposition 13 Study "hot spot" GIS layer. • SFEI Proposition 13 Study GIS land use analysis using ABAG data. • SFEI Proposition 13 Study PG&E facility GIS layer.[1] • SFEI Proposition 13 Study auto dismantler GIS layer. • SFEI Proposition 13 Study railroad GIS layer. • EPA Transformer Database (GIS layer created by SFEI).
Other Desirable Watershed Attributes	Is the watershed's size (i.e., area in square kilometers) within an acceptable range for the pilot study work?	SFEI Proposition 13 Study Bay Area watershed GIS layer.
	Is there a pump station at the bottom of the watershed?	SFEI Proposition 13 Study Bay Area pump station GIS layer.
	Are municipal street and storm drain system operation and maintenance activities conducted routinely in the watershed?	CW4CB project management team knowledge, municipal staff interviews.
Regional Context	Will pilot work in this watershed fit into the broader regional context of pilot-testing a range of pollutant control strategies, including pollution prevention, site remediations, enhanced sediment management, stormwater treatment retrofits, and diversion of stormwater to existing POTWs?	CW4CB project management team knowledge.
Barriers and Opportunities	Are there institutional, regulatory, political, technical, and/or organizational barriers to conducting pilot work in the watershed that cannot be easily addressed?	CW4CB project management team knowledge, municipal staff interviews.
	Have previous pertinent studies been conducted in the watershed?	CW4CB project management team knowledge, municipal staff interviews, project reports or other data.

[1]CW4CB currently does not have permission to use PG&E facility data but is working with Regional Water Board staff and SFEI to obtain that permission.

The CW4CB project management team and municipal staff will also determine whether there are institutional, regulatory, political, technical, and/or organizational barriers associated with a potential pilot watershed. In addition, an important consideration during the selection process will be whether pilot work in a proposed watershed would fit into the broader regional context of pilot-testing a range of pollutant control strategies, including pollution prevention, site remediations, enhanced sediment management, stormwater treatment retrofits, and diversion of stormwater to existing POTWs.

The CW4CB project work plan schedule calls for completing the pilot watershed selection process by the end of the first quarter of the project (September 30, 2010). It is anticipated that most or all of the watersheds will be selected by this date. After the five pilot watersheds are selected, CW4CB Task 3 will identify PCB and mercury source areas within the project watersheds and refer these sites to regulatory agencies for cleanup and abatement. Table 3 of the CW4CB work plan includes the schedule for implementation of this effort.

3.0 PILOT PROJECTS TO EVALUATE AND ENHANCE MUNICIPAL SEDIMENT REMOVAL AND MANAGEMENT PRACTICES

As noted previously, MRP Provisions C.11/12.d. require that Permittees work collaboratively to develop and pilot-test methods to enhance removal of sediment with PCBs and mercury, mainly during existing municipal street and storm drain system operation and maintenance activities. CW4CB Task 4 will implement this requirement. Permittees are required to conduct this pilot work in the five pilot watersheds selected for Provisions C.11/12.c. (CW4CB Tasks 2 and 3). The evaluation will include typical routine municipal operation and maintenance practices such as street sweeping, catch basin cleaning, and stormwater conveyance system cleaning, and will also include consideration of street flushing and routing the wash water to a sanitary sewer. Evaluation of existing information on high-efficiency street sweepers is also a specific C.11/12.d. requirement. As a first step, CW4CB has recently initiated a review of existing literature and other information relevant to these evaluations. Table 3 of the CW4CB work plan includes the schedule for implementation of this effort (see Task 4).

4.0 PILOT PROJECTS TO EVALUATE ON-SITE STORMWATER TREATMENT VIA RETROFIT

Provisions C.11/12.e. require that Permittees retrofit PCB and mercury treatment systems into existing storm drainage infrastructure at 10 locations throughout the Permittees' jurisdictions and evaluate effectiveness. CW4CB Task 5 will implement this requirement. It is anticipated that some but not all of the retrofits will be sited within the five pilot watersheds identified by CW4CB Task 2. Permittees are required to install at least one retrofit in each of five major Bay Area counties covered by the MRP (Santa Clara, San Mateo, Alameda, Contra Costa, and Solano) and report on candidate locations with types of treatment retrofit for each location in the September 2011 Annual Report. This effort is at an early stage and has consisted to-date of initial conceptual discussions at the project management team meetings. The project management team is also working with EPA to better define procurement rules in relation to retaining a consultant in the near future to perform an initial conceptual screening of retrofits potentially applicable to this project. Table 3 of the CW4CB work plan includes the schedule for implementation (see Task 5).

5.0 DEVELOPMENT OF A RISK REDUCTION PROGRAM IMPLEMENTED THROUGHOUT THE REGION

Provision C.11/12.i. requires that Permittees implement a regional program of risk communication activities to raise public awareness of fish contamination issues in San Francisco Bay and to encourage fish-consuming populations to reduce their exposure to pollutants in contaminated fish. CW4CB Task 6 will implement this requirement. The project work plan (BASMAA 2010) describes how this effort will be accomplished and includes four general subtasks:

- Sub-task 1. Convene a risk reduction stakeholder advisory group.
- Sub-task 2. Develop a broad risk communication strategy.
- Sub-task 3. Award and oversee implementation of mini-grants.
- Sub-task 4. Conduct evaluation activities.

Table 3 of the CW4CB work plan includes the schedule (see Task 6). It should be noted that BASMAA developed the work plan tasks and schedule in coordination with a Bay Area risk reduction work group that includes representatives from BASMAA, the California Department of Public Health, Bay Area Clean Water Agencies (BACWA), and Regional Water Board staff. Task 6 is being funded through CW4CB, potentially with additional funding from other dischargers to the Bay that have similar NPDES permit requirements, including BACWA and industrial dischargers. The work group held scoping meetings on December 1, 2009 and January 26, 2010 and also had many telephone and e-mail communications during early 2010 related to task and schedule development.

6.0 REFERENCES

BASMAA 2010. *Clean Watersheds for a Clean Bay - Implementing the San Francisco Bay PCBs and Mercury TMDLs with a Focus on Urban Runoff.* Prepared by the Bay Area Stormwater Management Agencies Association (BASMAA) for USEPA. September 23, 2009 (Revised April 19, 2010).

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Stormwater Pump Station Diversions Feasibility Evaluation

Prepared for

Bay Area Stormwater Management Agencies Association (BASMAA)

Oakland, California

DRAFT

Stormwater Pump Station Diversions Feasibility Evaluation

Prepared for

Bay Area Stormwater Management Agencies Association (BASMAA)

Oakland, California

September 13, 2010

BC Job # 139444

This is a draft and is not intended to be a final representation of the work done or recommendations made by Brown and Caldwell. It should not be relied upon; consult the final report.

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List of Abbreviations

BASMAA	Bay Area Stormwater Management Agencies Association
CW4CB	Clean Watersheds for a Clean Bay
FER	Feasibility Evaluation Report
GIS	geographic information systems
gpm	gallons per minute
HMP	hydromodification management plans
LID	Low Impact Development
mgd	million gallons per day
MPC	Monitoring and Pollutants of Concern
MS4s	municipal separate storm sewer systems
NPDES	National Pollutant Discharge Elimination System
O&M	operations and maintenance
PCBs	polychlorinated biphenyls
POTWs	publicly owned treatment works
PPDG	Project Planning and Design Guide
ROW	Right-of-way
SCADA	Supervisory control and data acquisition
SFEI	San Francisco Estuary Institute
SFB-RWQCB	San Francisco Bay Regional Water Quality Control Board
the Bay	San Francisco Bay
TMDL	Total Maximum Daily Load
TOC	Technical Oversight Committee
WLAs	Wasteload allocations

Executive Summary

This Feasibility Evaluation Report (FER) fulfills reporting requirements for Fiscal Year 2009/10 under provisions C.11.f and C.12.f of the Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit (Order No R2-2009-0074), more commonly referred to as the Municipal Regional Permit (MRP). Provisions C.11.f and C.12.f of the MRP are nearly identical provisions for control of mercury (C.11) and polychlorinated biphenyls (PCBs) (C.12) that require the evaluation of pilot diversions to publicly owned treatment works (POTWs) of dry weather urban runoff and/or first flush events from stormwater pump stations. The pilot projects are being evaluated in parallel with other BMP pilot implementation projects, including stormwater treatment retrofits, sediment management pilot projects, and source investigations to identify contaminated sites. The first product required under these provisions is a feasibility evaluation to be included in the 2010 Annual Reports for each Permittee. The feasibility evaluation is to include, but is not limited to, costs, and impacts on the stormwater and wastewater agencies and benefits to the receiving waters that would result from pilot projects that divert and treat dry weather runoff and first flush flows. The 2010 Annual Report is to summarize the feasibility evaluation, including:

- Selection criteria leading to the identification of five candidate and five alternate pump stations;
- Time schedules for conducting pilot studies; and
- A proposed method for distributing mercury and PCBs load reductions to participating wastewater and stormwater agencies..

Selection criteria have been developed based on a review of other programs that have scoped and/or implemented urban runoff diversion projects and discussions with stormwater program representatives. The Selection criteria are intended to inform the selection of sites (i.e., pump stations) for potential diversion and framed around water quality needs, the broader regional context of pilot-testing a variety of pollutant control strategies in the Bay Area, and acceptability, as summarized in Table ES-1 below.

Maps of PCB concentrations in sediments, pump station locations, and POTW service areas are included in this report to assist with the needs criterion. Guidance is also provided for addressing the acceptability criteria. Tools for developing cost estimates and estimating potential load reductions of PCBs and Hg from stormwater discharges as a result of pilot diversion projects are also included.

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Table ES-1. Proposed Selection Criteria and Information Needed

Criteria		Information Needed
Needs	Will the project yield a significant PCB load reduction?	PCB concentrations in sediments from the local drainage; Pump station inventories in GIS and tabular formats Event-mean PCB concentrations in stormwater; TSS and flow measurements; Drainage area assessments
	Will the project provide unique or new information?	Peer review from Technical Oversight Committee
	Does a pilot project fit into the broader regional context of pilot-testing a range of pollutant control strategies, including pollution prevention, site remediations, enhanced sediment management, and stormwater treatment retrofitting strategies?	Peer review from Technical Oversight Committee
Costs and Alternatives	Are the capital and operation and maintenance costs associated with diversion prohibitive?	Site investigations Conceptual designs and drawings Preliminary site-specific cost estimates Treatment and connection costs/charges.
	Are there ways to control upstream sources of PCBs through remediation, removal, isolation, or run-on diversion?	Source identification studies Peer review from Technical Oversight Group
	Can onsite treatment or infiltration retrofits be implemented?	Site investigations, including right-of-way mapping
Acceptability	Is there an accessible POTW willing and able to provide treatment service?	POTW service area map Communication with POTW managers
	Can the pilot diversion be sited within acceptable design criteria?	Pre-design checklist assessment (Table 1)

The cost and load estimating tools were applied to three hypothetical scenarios: a constructed pilot diversion, a temporary pilot diversion, and a strategic conveyance system cleanout pilot project. The constructed pilot diversion scenario resulted in an estimated PCB load reduction of 1.6 grams per year discharged to the Bay at a one-time cost of $750,000; over twenty years this would reduce 32 grams of PCBs at a cost of $23,500 per gram of PCBs removed; the cost per gram would increase if the hypothetical pilot diversion were to be terminated in less than twenty years. The temporary pilot diversion scenario resulted in an estimated one-time load reduction of 0.11 grams discharged to the Bay, at a cost of $180,000, or $1,600,000 per gram of PCBs removed in total. The strategic conveyance system cleanout scenario resulted in an estimated one-time load reduction of 0.095 grams of PCBs per year, at a cost of $28,000, or $300,000 per gram of PCBs removed in total. All three of these scenarios represent fractionally small (0.0006 to 0.008 percent) amounts of the total estimated stormwater PCB load currently discharged to the Bay (20 kg). Those hypothetical costs all reflect the simplifying assumption that the receiving POTW waives treament fees.

The simplifying assumption that a POTW waives treatment fees is, in fact, unlikely. In most cases, wastewater and stormwater programs are funded through separate sources, and so institutional factors may make such a waiver problematic. Connection fees typically range from $9,000 to $18,000 per thousand gallons per day, and treatment fees typically range from $300 to $2,400 per MG treated. As a result, these cost estimates for the hypothetical scenarios are llikely underestimated. Other charges may also be assessed, such as East Bay MUD's "wastewater capacity fee" of at least $97.40 per 100 cubic feet per month, or $130,000/MG/month.

The report concludes with a proposed approach to distribute credit for load reductions to participating stormwater programs and POTWs, and a proposed preliminary schedule for pilot project implementation.

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Section 1

Background

This Feasibility Evaluation Report (FER) fulfills reporting requirements for Fiscal Year 2009/10 under provisions C.11.f and C.12.f of the Municipal Regional Stormwater National Pollutant Discharge Elimination System (NPDES) Permit (Order No R2-2009-0074), more commonly referred to as the Municipal Regional Permit (MRP). Provisions C.11.f and C.12.f of the MRP are nearly identical provisions for control of mercury (C.11) and polychlorinated biphenyls (PCBs) (C.12) that require the evaluation of pilot diversions to publicly owned treatment works (POTWs) of dry weather urban runoff and/or first flush events from stormwater pump stations. The pilot projects are being evaluated in parallel with other BMP pilot implementation projects, including stormwater treatment retrofits, sediment management pilot projects, and source investigations to identify contaminated sites. The first product required under these provisions is a feasibility evaluation to be included in the 2010 Annual Reports for each Permittee. The feasibility evaluation is to include, but is not limited to, costs, and impacts on the stormwater and wastewater agencies and benefits to the receiving waters that would result from pilot projects that divert and treat dry weather runoff and first flush flows. The 2010 Annual Report is to summarize the feasibility evaluation, including:

- Selection criteria leading to the identification of five candidate and five alternate pump stations;
- Time schedules for conducting pilot studies; and
- A proposed method for distributing mercury and PCBs load reductions to participating wastewater and stormwater agencies.

The data sources, computational tools, and recommendations of this report are intended to guide municipal Permittees in the selection and scoping of stormwater pilot diversion pilot projects. This section presents a brief overview of the problem statement and planning context of the pilot diversion concept. The second section summarizes the approach to develop this Feasibility Evaluation Report (FER). The third section summarizes the findings in regard to:

- Selection criteria to inform site selection
- Cost/benefit analysis of three example scenarios
- A framework for crediting load reductions attained
- Information tools available
- Opportunities and constraints

The fourth section of the report briefly summarizes for Permittees how the tools in this report can be used to scope out candidate pump station pilot diversion projects. The report concludes with a proposed preliminary schedule for selection of candidate pump stations and development and implementation of pilot project studies.

1.1 Problem Statement

Bay Area storm water dischargers have been required to implement significant reductions in the annual loads of mercury and polychlorinated biphenyls (PCBs) discharged to San Francisco Bay (the Bay) from areas served by municipal separate storm sewer systems (MS4s). The requirements have been established as wasteload allocations (WLAs) in the Total Maximum Daily Load (TMDL) plans for mercury and PCBs in the Bay adopted by the San Francisco Bay Regional Water Quality Control Board

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(SFB-RWQCB 2006; SFB-RWQCB, 2008). The mercury TMDL requires a two-fold reduction in the annual average mass of mercury discharged from urban stormwater, from the current estimated load of 160 kg/yr down to 82 kg/yr by the year 2026. The PCBs TMDL requires approximately a tenfold reduction in the annual average mass of PCBs discharged from all stormwater[1] (i.e., urban and non-urban), from 20 kg/yr down to 2 kg/yr by the year 2028.

Those numeric load reduction targets are important to keep in mind when evaluating the load reduction benefit of any specific pilot project and comparing to other alternatives for PCB load reduction. They also show that PCB load reduction is the driver for planning control measure implementation, because the reductions required are larger than those of mercury. For this reason, SFB-RWQCB staff has guided Bay Area Stormwater Management Agencies Association (BASMAA) members to plan pilot projects with a focus on PCB load reductions, and report the mercury load reductions attained by those same pilots. Following that guidance, this FER focuses on PCBs for planning and scoping pump station pilot diversion projects; parallel load reduction calculations for mercury are included for completeness with the MRP requirements.

The MRP states that the objectives of the pilot diversion pilot studies are to:

- Evaluate the reduced loads of PCBs and mercury from diversion of dry weather and first flush urban runoff to sanitary sewers;
- Gain knowledge and experience to determine the implementation level of urban runoff diversion in subsequent permit terms; and
- Document the knowledge and experience gained through pilot implementation.

The pilot diversion projects that would result from this study are not expected to be the sole, or even most significant, actions to implement reductions in discharges for the PCBs TMDL. Although pilot diversions are expected to yield some quantifiable pollutant load reduction benefit, the most significant benefit of the pilot projects is the lessons learned about key management questions:

- Can pilot diversion of first flush and/or dry weather urban runoff significantly reduce stormwater loads of PCBs?
- What is the cost per gram of PCBs removed by the pilot diversion approach?
- How does that cost per gram for pilot diversion compare to alternatives such as pollution prevention, remediation of contaminated sites, strategies to enhance pollutant removal during sediment management, and stormwater treatment retrofits?
- What are the technical, regulatory, and institutional challenges to stormwater diversion into POTWs for the purposes of reducing PCB loads?
- What would motivate a POTW to accept stormwater for treatment?

Answering these management questions is beyond the scope of this FER. The questions above establish a framework for the final report on the pilot projects.

[1] The PCBs TMDL assumes that the non-urban contribution of PCBs is relatively small, i.e., < 0.1 kg/yr, compared to the urban contribution. If this assumption is correct, then the requirement for a 90 percent load reduction from “all stormwater sources” would have essentially the same outcome as requiring a 90 percent load reduction from urban stormwater.

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1.2 Planning Context

It is important to understand the overall planning context of this FER. Pilot diversion projects are but one facet of a broader control strategy for PCBs and mercury that involves many different activities (Figure 1-1). The implementation plans for the PCBs and mercury TMDLs are adaptive – lessons learned during the first decade of implementation will guide future emphasis on projects and activities that have relatively greater efficacy per unit cost. Projects required of stormwater dischargers to adaptively implement the mercury and PCBs TMDLs are specified in provisions of the MRP, and are briefly summarized below.

Load reductions expressed as WLAs in a TMDL are implemented by the SFB-RWQCB through provisions in adopted NPDES permits. For Bay Area stormwater dischargers, the MRP requires four general types of pilot projects and activities to show progress towards attaining WLAs for PCBs and mercury: pollution prevention, remediation of contaminated sites, strategies to enhance pollutant removal during sediment management, and stormwater treatment.

Pollution prevention activities focus on stopping PCBs and mercury from getting into stormwater in the first place. Pollution prevention for mercury focuses on collection and recycling of mercury-containing products (Provision C.11.a of the MRP). Pollution prevention for PCBs focuses on industrial inspections (Provision C.12.a), such as the evaluation and prevention of PCB release from building materials such as caulk (Provision C.12.b).

Remediation of contaminated sites and strategies to enhance pollutant removal during sediment management rely on the fact that both mercury and PCBs tend to be associated with sediments. Monitoring studies have shown that PCB concentrations are heterogenous throughout the San Francisco Bay area. Substantial concentrations of PCBs in sediments (e.g, 1 mg/kg up to 90 mg/kg) may be found today in flood control conveyances downstream of areas where PCBs were historically used and/or released (Yee and Mckee, 2010)[2]. The report by Yee and Mckee (2010) also pointed out that in many cases, identification of high PCB concentrations in sediments at one location would indicate that a "halo" of elevated PCB concentrations in sediments may be found within approximately 2500 meters of the contaminated site. Provisions C.11.c and C.12.c require pilot projects to investigate and remediate on-land locations with elevated PCB and mercury concentrations in sediment.

Provisions C.11.d and C.12.d require pilot projects to develop and pilot-test methods to enhance removal of sediment with PCBs and mercury, mainly during existing municipal street and storm drain system operation and maintenance activities. These provisions also require consideration of street flushing and routing to the sanitary sewer, an approach that overlaps with one of the scenarios evaluated in this FER (stormwater conveyance cleanouts). In addition to managing contaminated sediments through street sweeping and cleanouts of stormwater conveyances, it will be important to focus efforts on removing or capping in-place sources of contaminated sediments to streets and stormwater conveyances.

Stream maintenance and ecosystem restoration projects in streams and baylands at times involve sediment removal and/or stream bank stabilization. To the extent that those activities also remove or isolate in place contaminated sediment, they provide a load reduction benefit to the Bay. Conversely, if stream maintenance or ecosystem restoration projects mobilize previously isolated contaminated sediments, those activities would increase contaminant loads to the Bay.

[2] The summary report by Yee and Mckee compiles data from studies including: Applied Marine Sciences (AMS) Inc. (2002a); AMS 2002b; AMS, 2007; EOA (20002a); EOA (2002b); EOA (2002c); EOA (2003a); EOA (2003b); EOA (2004); EOA (2007a); EOA (2007b); and Klienfelder (2006). Those original reports are available in the supplemental CD provided with this FER.

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Stormwater treatment may be beneficial in situations where it is too late to prevent on-land pollution, and defined, controllable source areas cannot be identified. Stormwater treatment can include designing and constructing dedicated treatment retrofits to serve contaminated catchments. Pilot treatment retrofits are required under Provision C.11.e for mercury and C.12.e for PCBs.

MRP Provisions C.11/12.c., d., and e. are being implemented through a regional collaboration that is funded through a grant from the United States Environmental Protection Agency, with local cost matches (BASMAA, 2010). Alternatively, stormwater treatment can be accomplished by existing POTWs, if diversion and conveyance systems can be feasibly constructed and a local POTW can be identified that is willing and able to provide treatment services. That approach is required by Provision C.11.f for mercury and C.12.f for PCBs, and this approach is the focus of this FER.

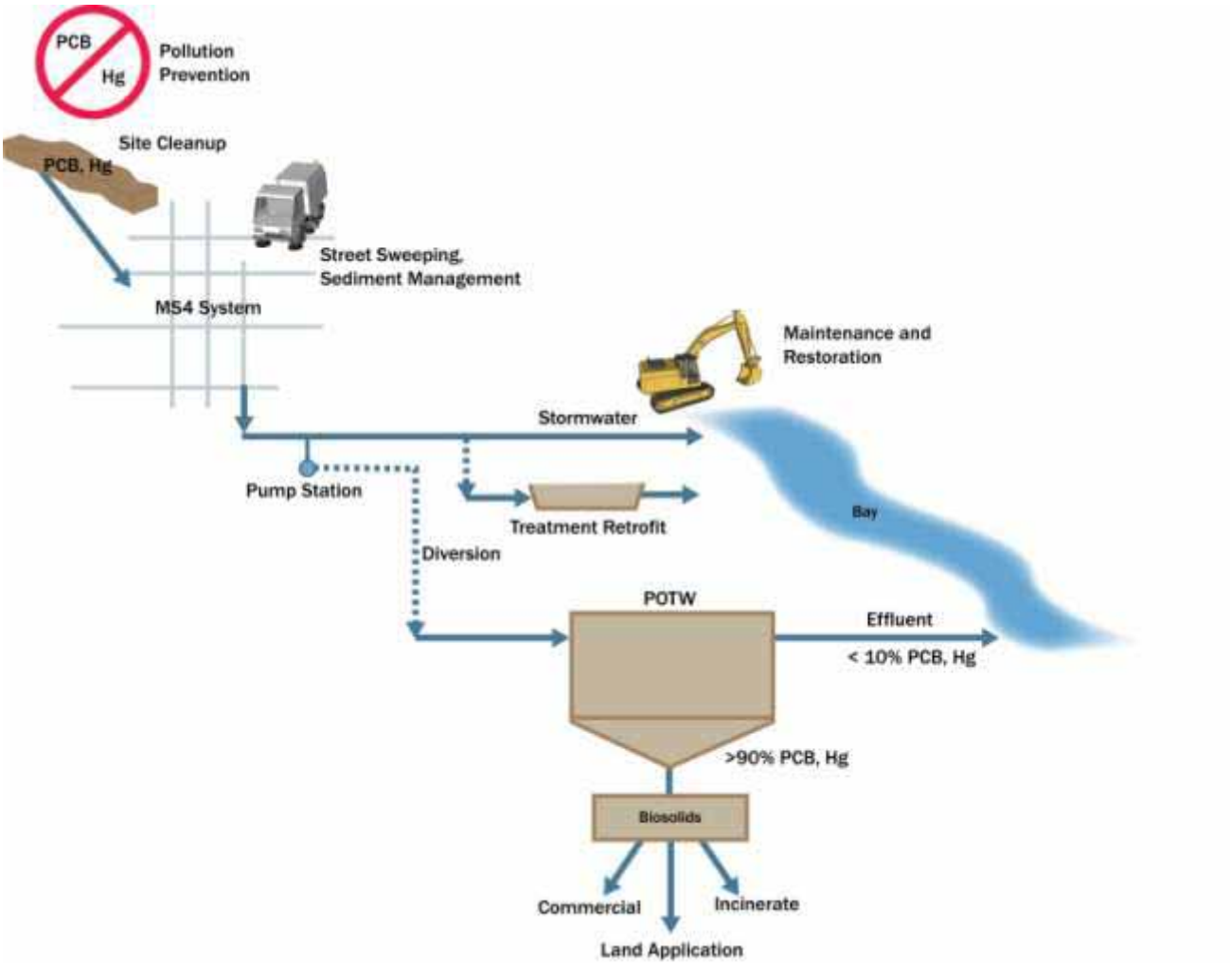

Figure 1-1. Conceptual Illustration of Pilot Stormwater Diversion to POTW Projects in Context with Other Potential Control Strategies

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Section 2

Approach

2.1 BASMAA Technical Oversight

This report has been prepared under the direction of BASMAA representatives. The scope of work was developed through a series of discussions at BASMAA Monitoring and Pollutants of Concern (MPC) committee meetings in January through March, 2010. Staff and Permittees from each countywide stormwater program began meeting once a month in June 2010 to provide technical oversight to development of this FER. This Technical Oversight Committee (TOC) will continue to advise Permittees who are scoping and implementing pilot diversion projects. The primary role of TOC during the implementation stage will be to provide consistency in effectiveness evaluation methods and peer review on the value of new information expected from pilot projects and the merits of diversion pilots as compared to other pollutant control alternatives possible at the proposed locations. The TOC for this FER also has considerable overlap with the Clean Watershed for a Clean Bay (CW4CB) grant project, providing coordination between the two experts.

2.2 Information gathered

In general, two types of information were gathered and compiled for this report: information on contaminated sediments in the Bay Area, and information about urban runoff diversion into POTWs. In addition, geographic information systems (GIS) data were made available by the San Francisco Estuary Institute (SFEI) upon completion of their Proposition-13 funded study focused on urban runoff best management practices (Yee and Mckee, 2010). Concentrations of PCBs in sediments have been superimposed on locations of pump stations and POTWs to assist in the selection of candidate locations. Maps of POTW service areas are provided alongside the GIS representations to further assist the selection[3].

2.3 Approach to Development of Selection Criteria

The approach to developing the draft selection criteria starts by looking at other programs that have scoped and/or implemented urban runoff diversion projects. The approach builds on the thought process worked out by other programs by addressing the following questions:

- What selection criteria have been used by other programs to evaluate the feasibility of urban runoff diversions into treatment plants?
- What are the most appropriate selection criteria for projects in the San Francisco Bay region that would meet the requirements of Provision C.11.f/C.12.f? Selection criteria should address relevant pump station and POTW characteristics and institutional barriers/incentives.
- What regional and site information is needed to evaluate a project using the selection criteria?
- What specific regional information is currently available that would enable use of the selection criteria?

[3] Note to BASMAA reviewers: GIS layers of POTW service areas have been recently acquired and, at the direction of the oversight committee for this report, can be incorporated directly onto the maps of contaminated sediments and pump station locations.

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- What are the known data gaps?
- How would a program that is scoping a diversion project address the data gaps?

2.3.1.1 Selection criteria used by other programs

This section summarizes selection criteria used to scope and/or implement pilot diversion projects from three case studies: California Beach communities, the Las Vegas Valley, and the California Department of Transportation.

2.3.1.1.1 California Beach Communities

During the information gathering stage of this project, the following California communities were identified that have developed diversion programs:

- Orange County
- San Diego County
- Los Angeles County
- Ventura County
- Monterey County
- Santa Cruz County

All of the counties above have beach communities. Essentially all of the dry weather diversion projects carried out in those communities have been motivated by the need to reduce or eliminate sources of bacteria to beaches and other areas used for water contact recreation. Of the programs reviewed, the Orange County Watersheds (2003) report was the only one which provided detailed documentation of their selection (or decision) criteria. The flowchart illustrating the decision criteria for dry weather diversions in Orange County is shown in Figure 1.

The Orange County selection criteria thought process illustrated in Figure 1 starts by screening against the two following general questions about dry weather discharges in coastal watersheds:

- Is there a water quality impairment to be addressed?
- Are there source control or treatment alternatives to dry weather diversions?

If the answers are yes, there is a water quality impairment and no, there are no better alternatives such as source control or onsite treatment, then the site is assessed against acceptability criteria for diversion into the Orange County Sanitation District conveyance and treatment system. Acceptability criteria used in Orange County Watersheds (2003) are:

- Local conveyance and treatment capacity;
- Potential to impact recreation or habitat by diversion;
- Other community and/or regulatory concerns.

As noted above, the Orange County Watersheds (2003) report is the most formal documentation of diversion selection criteria available. Interviews with project stakeholders from some of the above beach communities (e.g., City of Santa Cruz, Orange County Sanitation District), were conducted during the development of a draft Selenium Management Plan for Las Vegas Wash (Brown and Caldwell, 2009a). In addition, stakeholders involved in dry weather diversions in the cities of Los Angeles and Ventura were interviewed during the development of a white paper on urban runoff diversions on behalf of the Bay Area Clean Water Agencies (Carollo, 2009). Those stakeholder interviews tend to support the more formal acceptability criteria, as outlined above.

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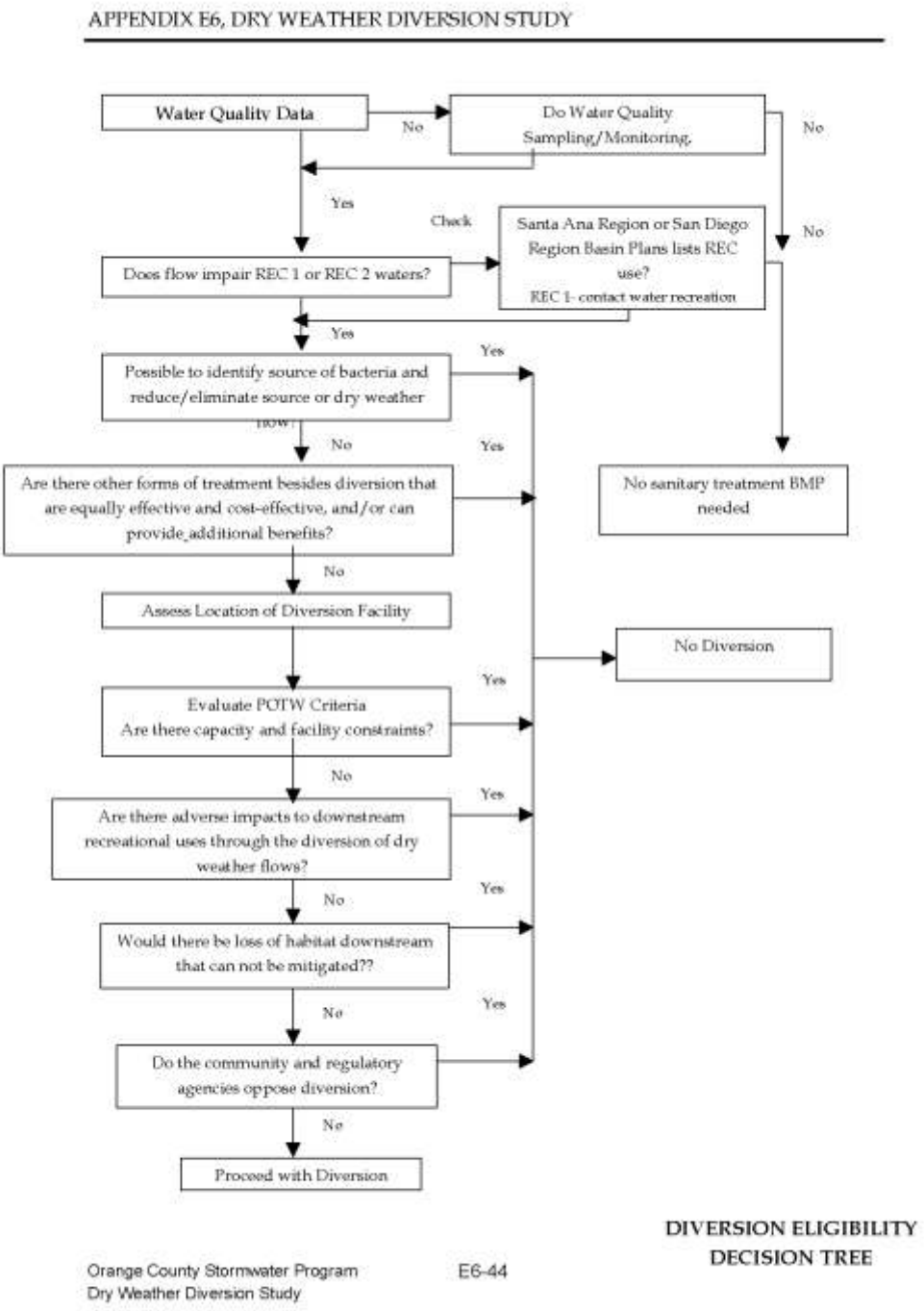

Figure 2-1. Decision Tree for Dry Weather Diversion Consideration in Orange County, California.

From Orange County Stormwater Program (2003)

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2.3.1.1.2 Las Vegas Valley

The draft Las Vegas Wash Selenium Management Plan (Brown and Caldwell, 2009a) followed an overall thought process similar to Southern California beach diversion projects, starting with water-quality needs and source area opportunities, and subsequently screening opportunity areas against capacity, constructability, cost, and community acceptance criteria. In the case of the Las Vegas Wash, the pollutant of concern was selenium in a desert wetland ecosystem, rather than bacteria in waters of swimmable beaches. The interest in reducing selenium loads was as a mitigation measure for the construction of an effluent bypass pipeline project to a deepwater outfall at Lake Mead. If constructed, the pipeline would generate electric power from the elevation drop to Lake Mead, and it would remove treated wastewater discharges from the Las Vegas Wash. These discharges provide dilution of selenium concentrations within existing groundwater seepage that enters the wash. Consequently, a means of reducing selenium loads via diversion of dewatering and seepage flows from tributaries of the wash into wastewater treatment plants would add value to the project by enabling diversion of relatively larger effluent flows from Las Vegas Wash into the pipeline, thereby creating relatively more electric power while concurrently reducing surface water impacts of treated effluent to Lake Mead, as the pipeline would allow discharge at the bottom of the lake.

The selection criteria led to diversion of selenium seepage sources into treatment plants from the base of watersheds as the most cost-effective alternative, because of the economic value of water flowing through the proposed bypass pipeline. The plan accounted for uncertainty in the alternatives analysis by proposing an adaptive approach that would initiate the more straightforward diversion projects in initial stages, while concurrently evaluating the feasibility of reducing seepage flows by changes in upland irrigation management practices or installation of onsite treatment or upstream diversion projects. The adaptive management decision tree proposed in the draft Las Vegas Wash Selenium Management Plan is illustrated in Figure 2-2 below.

Owing to declining economic conditions in the Las Vegas Valley, the bypass pipeline project has been put on hold (i.e., shelved); therefore, the draft Selenium Management Plan has not advanced beyond the planning and conceptual design/cost estimating stage. The draft plan does offer useful preliminary design and cost estimating concepts for large scale (i.e., 1 to 6 mgd) diversion projects involving varying levels of complexity in conveyance system design.

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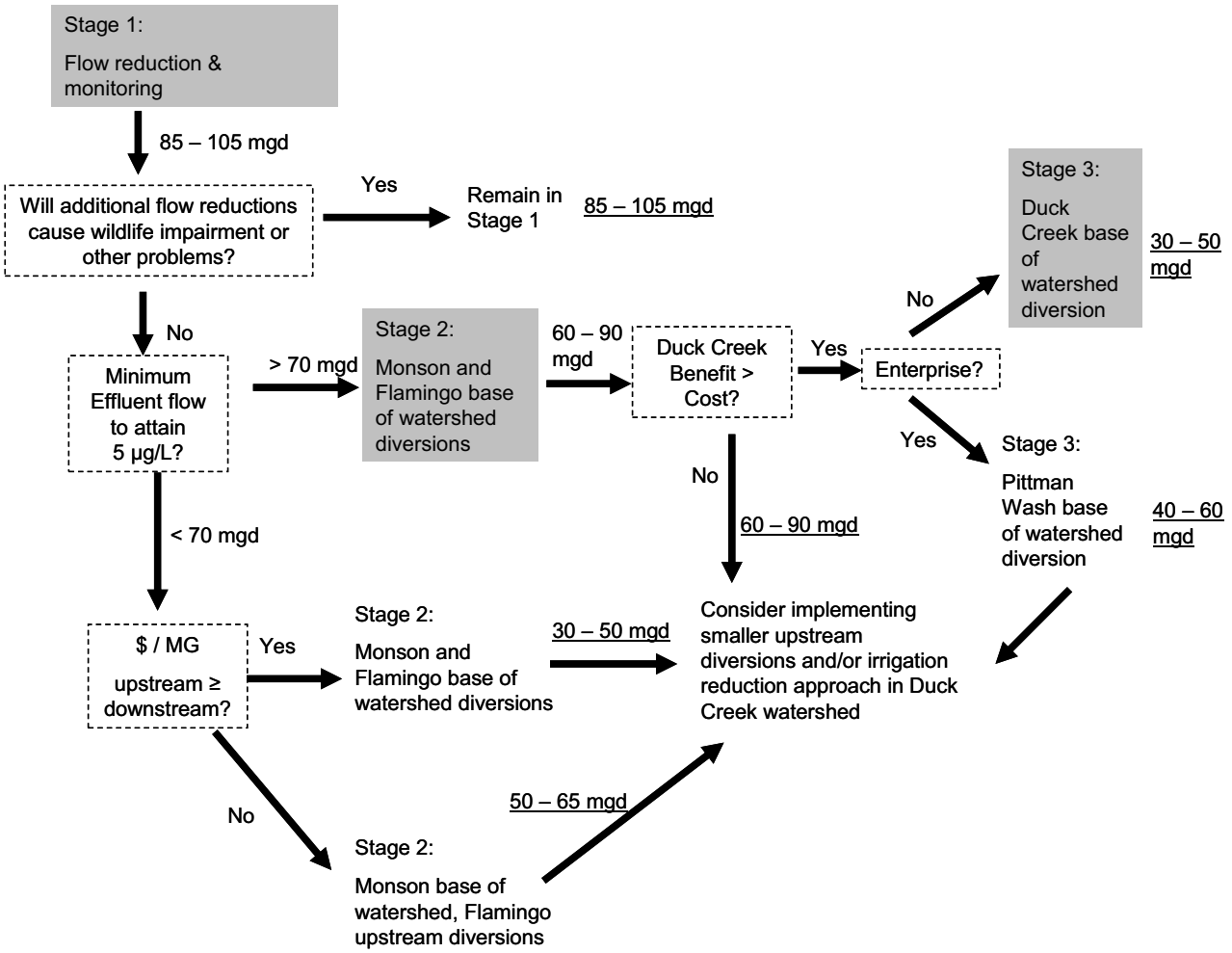

Figure 2-2. Adaptive Management Decision Tree for the Las Vegas Wash Selenium Management Plan.
Numbers associated with each arrow represent the estimated minimum effluent flow range (mgd) to attain 5 µg/L water quality standard at the completion of each stage. The goal of the plan is to attain the lowest possible effluent flow, while maintaining selenium concentrations below the water quality standard. Underlined numbers represent the estimated minimum effluent flow ranges at the completion of Plan implementation. Dashed boxes indicate decision points. Shaded boxes indicate the likely course of action based on current information.

2.3.1.1.3 The California Department of Transportation (Caltrans)

The Caltrans Stormwater Quality Handbooks' Project Planning and Design Guide (PPDG) defines a regimented process for selection of structural BMPs during the design process for major projects. Selection criteria are defined by the "T-1 Checklist," which appears in Appendix E of the PPDG. If dry weather flows are present, designers are to consider dry weather diversions. Figure 2-3 below shows the feasibility and design criteria used in the Caltrans design process to consider dry weather diversions. The Caltrans example is a useful starting point for informing more detailed selection analysis of siting and design feasibility.

One example of a dry weather diversion constructed by Caltrans is the Jamboree Road overcrossing near Interstate 5 in Orange County. In that location, dewatering discharges are sent to the Orange County Sanitation Disrtict because of concerns over nitrogen and selenium in San Diego Creek. An example of temporary diversions by Caltrans is the Caldecott Tunnel, connecting Alameda County and Contra Costa County. Power washing discharges from the tunnel are diverted to the East Bay Municipal Utility District.

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Dry Weather Flow Diversion

Feasibility

1. Is a Dry-Weather Flow Diversion acceptable to a Publicly Owned Treatment Works (POTW)? ☐Yes ☐No
2. Would a connection require ordinary (i.e., not extraordinary) plumbing, features or construction methods to implement? ☐Yes ☐No

   If "No" to either question above, Dry Weather Flow Diversion is not feasible.
3. Does adequate area exist within the right-of-way to place Dry Weather Flow Diversion devices? ☐Yes ☐No
   If "Yes", continue to Design Elements sections. If "No", continue to Question 4.
4. If adequate area does not exist within right-of-way, can suitable, additional right-of-way be acquired to site Dry Weather Flow Diversion devices and how much right-of-way would be needed? _____ (acres) ☐Yes ☐No
   If "Yes", continue to the Design Elements section.

   If "No", continue to Question 5.
5. If adequate area cannot be obtained, document in Section 5 of the SWDR that the inability to obtain adequate area prevents the incorporation of this Treatment BMP into the project. ☐Complete

Design Elements

* **Required** Design Element – A "Yes" response to these questions is required to further the consideration of this BMP into the project design. Document a "No" response in Section 5 of the SWDR to describe why this Treatment BMP cannot be included into the project design.

** **Recommended** Design Element – A "Yes" response is preferred for these questions, but not required for incorporation into a project design.

1. Does the existing sanitary sewer pipeline have adequate capacity to accept project dry weather flows, or can an upgrade be implemented to handle the anticipated dry weather flows within the project's budget and objectives? * ☐Yes ☐No
2. Can the connection be designed to allow for Maintenance vehicle access? * ☐Yes ☐No
3. Can gate, weir, or valve be designed to stop diversion during storm events? * ☐Yes ☐No
4. Can the inlet be designed to reduce chances of clogging the diversion pipe or channel? * ☐Yes ☐No
5. Can a back flow prevention device be designed to prevent sanitary sewage from entering storm drain? * ☐Yes ☐No

Figure 2-3. Feasibility and Design Criteria Used by Caltrans for Dry Weather Diversions.

From the December 2008 Update of the Caltrans PPDG, Appendix E, T-1 Checklist Part 3

Feasibility Question #2 in Figure 2-3 above references "extraordinary plumbing." By way of example, the Caltrans PPDG defines extraordinary plumbing:

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> "Sites requiring extraordinary plumbing to collect and treat runoff (e.g., jacking operations under a highway, bridge deck collection systems, etc.) may be considered infeasible due to their associated costs. Sites requiring extraordinary features or construction practices, such as retaining walls and shoring, may also be infeasible due to their associated costs relative to the cost of the BMP itself."

Other than those examples of extraordinary plumbing, the wording of the PPDG is deliberately broad to allow the designer and the District Stormwater Coordinator lattitude to make design decisions.

In summary, the most well-documented programs of urban runoff diversion into sanitary conveyance and treatment systems involve dry weather diversions of urban runoff. In both the California beaches and Las Vegas Wash examples discussed above, the evaluation criteria started with water quality needs, then looked for alternatives to diversion to POTWs, and then screened diversions against acceptability criteria including conveyance and treatment capacity, constructability, cost, and community/regulatory acceptance. In the Caltrans example, the selection criteria reviewed focused on feasibility and constructability. Some important distinctions that set the above examples apart from this FER are:

- The tangible benefits of reducing beach closures or harvesting water in a desert may be more immediate and apparent to municipal decision makers than the concept of reducing PCB loads to the Bay; and
- The technical challenges of capturing and treating first flush and other stormwater flows would require some refinements to selection criteria to be used in this FER.

With those distinctions in mind, Section 3.1 in the Findings section below builds on the framework of "needs, alternatives, acceptability" to propose screening criteria to be used in this FER.

2.4 Approach to Develop Cost/Benefit Analysis

2.4.1 Cost Estimating Tools

Cost estimates for pilot diversions can be divided into two categories: **capital costs**, and **operations and maintenance (O&M) costs**.

Capital cost estimates for each component of a pilot diversion project are shown in Table 2-1. The estimates were developed from existing case studies for different agencies. These estimates are provided to illustrate ranges and will vary substantially depending on the agency and pump station location. Construction materials and labor will vary depending on the type of pilot diversion to be constructed. A pilot diversion which requires no additional pumps and is adjacent to a sanitary sewer line with excess capacity will have relatively small construction costs, while a pilot diversion which requires large quantities of large diameter pipe will cost much more. Connection fees will also vary depending on the sanitation agency and location of the pilot diversion. Diversions to POTWs with excess plant and sanitary sewer capacity will cost less than locations which require upgrades to sanitary sewers and treatment plants. Right-of-way (ROW) acquisition would depend on the type and quantity of land which is acquired. For the purposes of this analysis, it is assumed that ROW acquisition (or overly complex easement agreements) or treatment plant upgrades would lead to the conclusion that a pilot diversion project is not feasible. Supervisory control and data acquisition (SCADA) control costs will vary depending on the type of monitoring and control equipment specified. Some form of monitoring and controls would likely be required in all cases.

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Table 2-1. Planning Cost Estimates for Pilot Diversion Project Components

Component	Cost Range ($1000's)	Factors Affecting Cost
Construction Materials and Labor	25 – 750	Type of pilot diversion, length
Connection Fees	9 – 18/1,000 gpd	Sanitary sewer capacity, plant capacity, sanitary sewer ordinance requirements, discharge/sanitary sewer use fees
Right of Way	Variable	Size, land use, location
SCADA/Safety Controls	10 – 50	Type of monitoring/control
Capital Support (Permits, Planning and Design)	40 percent of construction costs	Complexity of diversion

Cost estimates based on information from Brown and Caldwell (2009a); Brown and Caldwell (2009b); Sacramento Stormwater Quality Partnership (2006); Orange County Stormwater Program (2003); San Francisco Estuary Partnership (2010).

Another significant consideration affecting capital costs would be the need to re-route existing utilities to accommodate the diversion. This has been a major cost factor in determining acceptable locations for treatment measures targeted at other pollutants, e.g. large in-line trash capture devices. For the purposes of this FER, those additional costs are not considered for pilot projects, as significant re-routing is assumed to be outside the scope of a pilot project.

O&M Costs are primarily related to the annual cost of electricity to operate pumps (if needed), monitoring the diversion to ensure proper function, scheduled and emergency maintenance of pumps and diversion structure, and the treatment fees established by the receiving POTW. Cost estimates for these activities and items are summarized in Table 2-2 below. The annual costs of electricity, inspections and maintenance are derived from monthly O&M costs reported by the Orange County Stormwater Program (2003) for small diversions ranging from 0.01 MGD to 0.3 MGD. By comparison, the Sacramento Stormwater Quality Partnership (2006) estimated annual O&M costs of $40,000 for similarly sized diversions. The lower range of treatment fees is based on the estimated "chemicals and electricity only" costs for a large Las Vegas Valley treatment plant estimated by Brown and Caldwell (2009a). The upper range is based on the "whole plant operational costs" estimated by Brown and Caldwell (2009a). The actual fee charged will depend on the individual POTW, and the jurisdictional relationship between the POTW and the stormwater discharger and local sanitary sewer use ordinance requirements. For comparison, treatment fees estimated by the Sacramento Stormwater Quality Partnership (2006) are approximately $340 per MG treated; The San Jose /Santa Clara Water Pollution Control Plant reports O&M costs of approximately $400 per MG treated.

Table 2-2. Planning O&M and Treatment Cost Estimates for Pilot Diversion Projects

Pump electricity, inspections and maintenance ($/year)	10,000 – 60,000
Treatment fees ($/MG gallons treated)	300 – 2400

Cost estimates based on information from Brown and Caldwell (2009a); Brown and Caldwell (2009b); Sacramento Stormwater Quality Partnership (2006); Orange County Stormwater Program (2003).

Electricity costs would be reduced for intermittent pumping, in proportion to the planned run time. For planning purposes, it can be assumed that a minimum of $5,000 per year is required for inspections and maintenance.

Table 2-3 shows the estimated costs for different potential pilot diversion scenarios. It is important to note that these cost estimates are based on simplifying assumptions and existing information. Actual costs can vary heavily depending on site/diversion specific characteristics.

For non-constructed pilot diversions there are no capital costs as the pilot diversion occurs by rented equipment and hired labor. The operation costs will vary depending on how the pilot diversions are

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staged. For pilot diversion and cleanouts staged during dry weather, scheduling and availability of equipment and staff is easier, thus lower costs are achieved, as opposed to increased costs attributed to mobilizations in response to wet weather events. The expected capital costs of constructed pilot diversions will vary depending on conveyance distance, pipe size, and if additional hydraulic head is required to divert stormwater.

Two types of constructed pilot diversions are potentially available. The type employed would depend on the location of the pump station (Figure 2-4). The one type (Option 1) would involve the installation of an additional pump (or pumps) within the wet well to divert flow directly to the sanitary sewer. This type of diversion provides inherent control of the quantity of water that can be diverted to the sanitary sewer, but involves higher initial costs due to pump station reconfiguration. However, the use of dedicated pumps selected to match the specific head requirements of the conveyance system would allow that system to be optimized, i.e., smaller pipe sizes can be used. This could result in cost saving for the conveyance system, which could be of particular importance for systems that require long conveyance pipes. Operation and maintenance would vary depending on the type and size of the pilot diversion. Another option (Option 2) would be a gravity-fed flow system using the existing pumps and capacity of the station. All stormwater discharged after the pumps would be diverted using only gravity flow to the sanitary sewer. A weir or other control device would be needed to prevent overloading of the sanitary sewer during large storm events. This type of pilot diversion requires larger-sized pipes, but no additional pumps. Gravity flows and passive pilot diversions would require less O&M while larger flows and pumps would regularly fall on the higher end of the expected range.

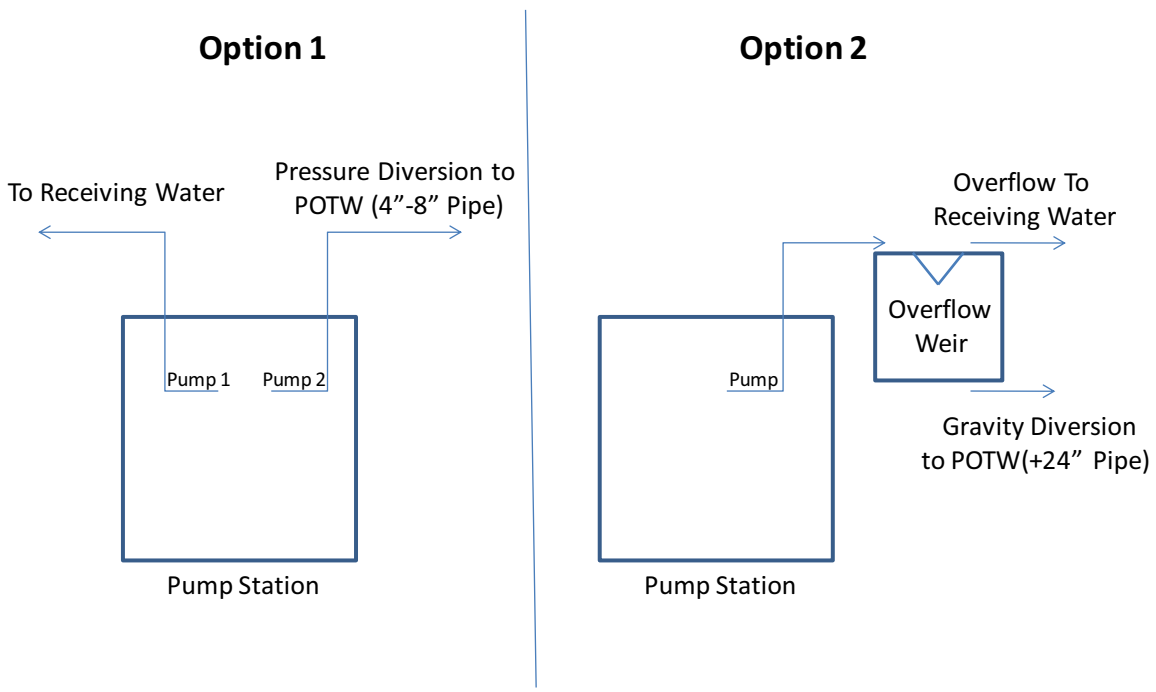

Figure 2-4. Conceptual diagram of two different options for pump station diversions.

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Table 2-3. Estimated Costs for Different Pilot Diversion Approaches

Pilot Diversion Approach	Capital Cost ($1,000)	O&M Cost ($1,000/yr)
Non-constructed pilot diversion using all rented equipment for strategic cleanout (7 days duration)	0	28
Non-constructed pilot diversion using all rented equipment in dry weather (90 days duration)	0	360
Non-constructed pilot diversion using all rented equipment in wet weather (30 days duration)	0	180
Constructed pilot diversion adjacent to sanitary sewer large enough to support gravity feed	100	10 – 60
Constructed pilot diversion adjacent to sanitary sewer requiring pumped feed	500	10 – 60
Constructed pilot diversion with moderate connection distance (<500 ft) to sanitary sewer large enough to support gravity feed	500 – 1,500	10 – 60
Constructed pilot diversion with moderate connection distance (<500 ft) to sanitary sewer via small diameter conveyance requiring pump	500 – 1,000	10 – 60
Constructed pilot diversion with long connection distance (>500 ft) to sanitary sewer large enough to support gravity feed	1,500 – 3,000+	10 – 60
Constructed pilot diversion with long connection distance (>500 ft) to sanitary sewer via small diameter conveyance requiring pump	500 – 1,500	10 – 60

Temporary pilot diversion costs assume $4,000 per day for labor during dry weather pilot diversions (four person crew) and equipment (one 20,000 gallon storage tank, three pumps, two support trucks, temporary check dams, and incidental equipment). Temporary pilot diversion costs are assumed to be 50 percent higher ($6,000 per day) during wet weather because of difficulties introduced by scheduling, safety and logistics.

2.4.2 Load Estimating Tools

The potential PCB load reduction benefits attainable from pilot diversion projects can be estimated based on either expected average PCB concentrations in stormwater, or expected average PCB concentrations in sediments captured by the pilot diversion. This section provides planning tools to assist with this estimation.

The first approach starts by asking “how much water is expected to be diverted into the POTW,” and “what is the average PCB concentration in that diverted water?” Water volumes can be estimated from the design storm perspective and the conveyance and treatment capacity perspective. The design storm perspective would multiply the catchment area (acres) by the design storm event (inches of rain) to derive the treatment volume, after unit conversion. However, in most cases, the limiting factor on treatment volume would be storage, conveyance and treatment capacity. Therefore, it makes most sense, for scoping purposes, to base treatment volume estimates on constraints established by the conveyance system, available storage capacity (if any), and limits on the treated volume that are either set by the POTW or that necessarily result from treatment costs. A similar approach would apply to dry weather diversions; rather than design storm considerations the flow question for a dry weather diversion would be “what is the average expected dry weather flow.”

For reference, a typical portable water tank can hold approximately 20,000 gallons. A diversion pump running at 75 gpm would move approximately 100,000 gallons in a day. If a 50 MGD treatment plant accepted up to 500,000 gallons of stormwater per day, the pilot diversion would use about 1 percent of the treatment capacity of the plant. Flows spanning this range are used to estimate loads.

PCB concentrations in stormwater can be estimated based on limited case study information available. The Ettie Street Pump Station Supplemental Environmental Project report (EBMUD 2010) serves as a useful benchmark for PCB concentrations in stormwater from a highly contaminated catchment of about 8 square kilometers comprised of mixed urban land uses with a predominantly industrial history. The report also provides data from Cerrito Creek, which is a similar sized catchment having an open creek in a suburban location that recieves stormwater flows from upstream residential and commercial areas.

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- Average PCB concentrations in dry weather from the Ettie Street Pump Station ranged from 3 ng/L to 5 ng/L at the pump station, and approximately 1 ng/L at the reference creek (Cerrito Creek).
- Average first flush stormwater concentrations ranged from 16 ng/L in Cerrito Creek to as much as 50 ng/L in the first flush and wet weather influent to the Ettie Street Pump Station.
- Episodic measurements as high as 200 ng/L were observed.
- That concentration range is used as a basis for estimating PCB loads removed by pilot diversions ranging from 20,000 gallons to 500,000 gallons in Table 2- below.

Table 2-4 highlights the fact that dry weather diversions would not yield substantial load reduction benefits if the PCB concentrations are relatively low (e.g., 1 ng/L). A dry weather diversion of 0.1 mgd would yield between 0.0004 to 0.004 grams of PCBs per day, or 0.1 to 1 grams per year if dry weather flows were pumped 250 days out of the year. That is equivalent to 0.0006 to 0.006 percent of the total PCB load reduction (18 kg) required from urban stormwater by the TMDL. To attain 10 percent of the total PCB load reduction (i.e., 1.8 kg), a total of 3.5 billion gallons per year of dry or wet weather runoff having an average concentration of 50 ng/L would be required.

For storm events that yield higher PCB concentrations in runoff, more substantial load reductions may be attained. If 100,000 gallons of water having 200 ng/L PCBs were diverted from a single storm event, a total mass of 0.08 grams of PCBs could be diverted from discharge to the Bay. If 500,000 gallons could be diverted during a single event, it would be equivalent to 0.4 grams of PCBs, or 0.002 percent of the 18 kg load reduction required of urban stormwater by the TMDL.

The equation used to calculate values in Table 2-4 is:

$$PCB(g) = PCB\left(\frac{ng}{L}\right) \times Volume\,(gal) \times \frac{3.785\ L}{gal} \times \frac{1g}{10^9 ng}$$

Table 2-4. PCB Load Estimating Tool (grams)

Diverted Volume (gal)	PCB Concentration in Stormwater (ng/L)				
	1	10	50	100	200
20,000	0.0001	0.0008	0.0038	0.0076	0.015
50,000	0.0002	0.0019	0.0095	0.019	0.038
100,000	0.0004	0.0038	0.019	0.038	0.076
200,000	0.0008	0.0076	0.038	0.076	0.15
400,000	0.0015	0.015	0.076	0.15	0.31
500,000	0.0019	0.019	0.095	0.19	0.38
1,000,000	0.0038	0.038	0.19	0.38	0.76

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For context, the expected range of PCB concentrations in stormwater can be estimated based on assumed concentrations of PCBs in sediments and total suspended sediments (TSS) concentrations (Figure 2-5). Typical PCB concentrations in sediments within the urban landscape range from 0.1 mg/kg to 1 mg/kg; contaminated sediments found in localized areas can be as high as 10 mg/kg or more. It is assumed that highly contaminated sediments would be addressed through sediment management or site remediation, and that diversion projects would address more diffuse contamination areas where the average first flush concentration of PCBs on suspended sediments is 1 mg/kg or less. Under typical TSS concentrations in stormwater (< 500 mg/L), PCB concentrations would tend to be 200 ng/L or less.

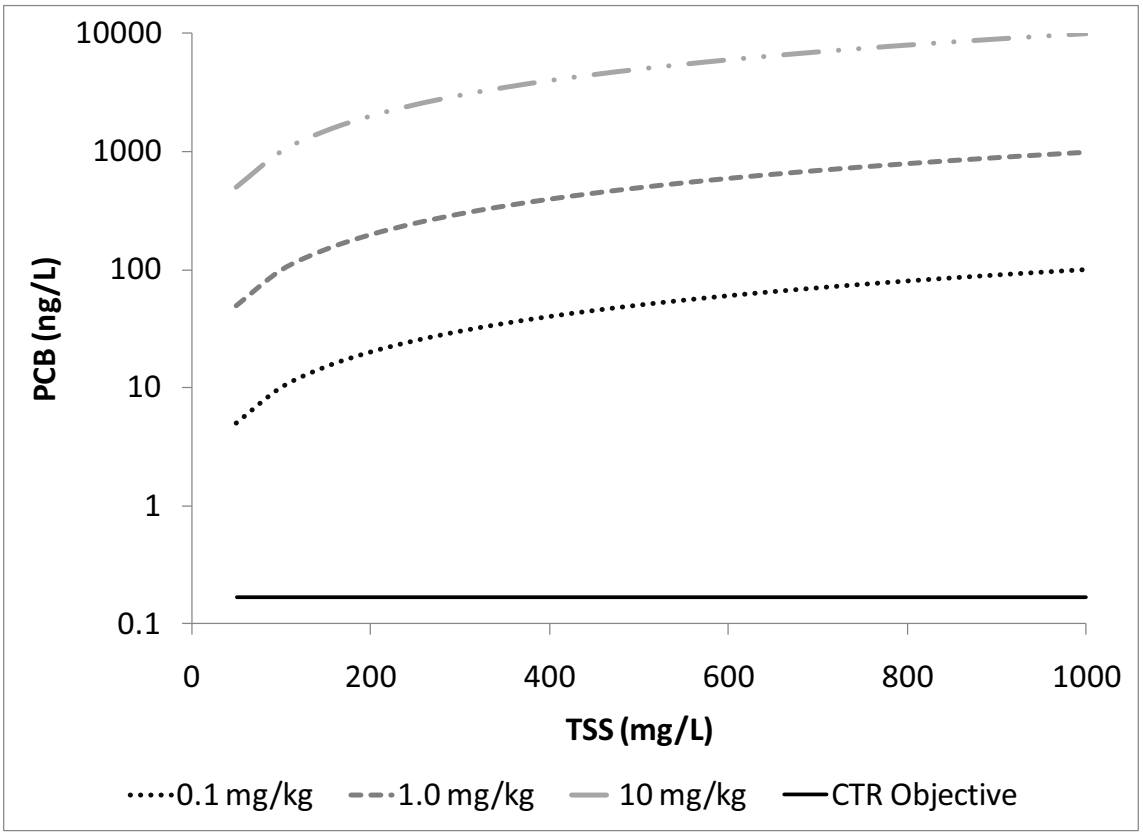

Figure 2-5. Concentrations of PCB vs. TSS under different assumed concentrations of PCBs in sediment.

Solid line indicates the California Toxics Rule (CTR) water quality objective (0.17 ng/L)

Tools similar to those used for PCBs can also be applied to estimating mercury loads avoided (Table 2-5, Figure 2-6). The higher range of mercury concentrations in stormwater (< 2,000 ng/L) reflects the assumption that mercury concentrations in suspended sediments from contaminated areas could be as high as 10 mg/kg.

This approach to load estimating is used to develop the cost-benefit analysis of example pilot diversion scenarios in Section 3.2.

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Table 2-5. Hg Load Estimating Tool (grams)

Diverted Volume (gal)	Hg Concentration in Stormwater (ng/L)				
	1	10	50	500	2000
20,000	0.0001	0.0008	0.0038	0.0379	0.1514
50,000	0.0002	0.0019	0.0095	0.0946	0.3785
100,000	0.0004	0.0038	0.0189	0.1893	0.7570
200,000	0.0008	0.0076	0.0379	0.3785	1.5140
400,000	0.0015	0.0151	0.0757	0.7570	3.0280
500,000	0.0019	0.0189	0.0946	0.9463	3.7850
1,000,000	0.0038	0.0379	0.1893	1.8925	7.5700

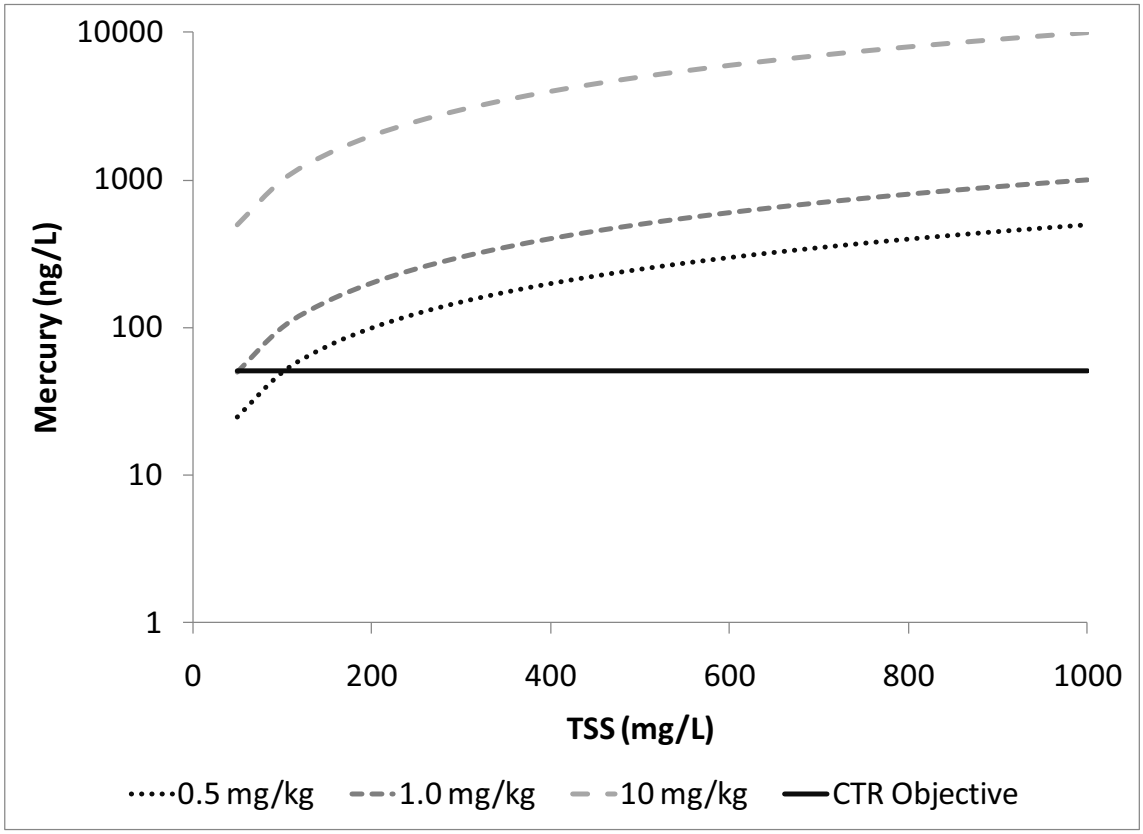

Figure 2-6. Concentrations of Hg vs. TSS under different assumed concentrations of Hg in sediment.

Solid line indicates the California Toxics Rule (CTR) water quality objective (0.50 ng/L)

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Section 3

Findings

3.1 Recommended Selection Criteria

This section proposes screening criteria that are developed around the framework of needs, alternatives, and acceptability outlined in the previous sections. These criteria are intended to inform the selection of pilot diversion sites, but may not include all considerations that would need to be taken into account as potential pilot diversion sites are evaluated.

3.1.1 Needs

The overall water quality need is a reduction in the load of PCBs and mercury discharged from urban areas into the Bay. Guidance from the SFB-RWQCB further specifies that pilot diversion projects should focus on abating discharges of PCBs from contaminated drainages, and concurrently evaluate the added value of mercury load reductions achieved by PCB-focused projects. That is, project siting decisions should be led primarily by PCB loads.

Watershed load reduction goals help put PCB loads into context as a selection criterion. The CW4CB grant recently awarded to BASMAA sets forth the ambitious goal of reducing PCB loads by 0.3 to 1.5 kg per year through a series of coordinated investigation, reporting, potential remediation, and treatment retrofit projects. If the goal is achieved, the load reduction would be about one to seven percent of the currently estimated 20 kg per year of PCBs discharging from Bay Area urban storm systems.

It is proposed that individual pilot diversion projects that reduce the current PCB load to the Bay by one percent or more per year (i.e., reduce PCBs by 0.2 kg/yr or more) could be considered meaningful steps towards attainment of the PCB wasteload allocation for urban stormwater. In contrast, pilot projects that attained load reductions on the order of 0.01 kg/year (ten grams) or less would not yield significant progress, by themselves. Small pilots could be useful if they can be cost-effectively replicated numerous times throughout the watershed, or if they provide information that can be scaled up to evaluate the costs and benefits of larger projects.[4]

The selection criteria based on water quality needs are summarized by the following two questions:

Will the project yield a substantial PCB load reduction? An important tool for answering this question is an understanding of the spatial distribution of PCBs in sediments of the San Francisco Bay watersheds. The most recently available synthesis of PCB monitoring data is available in the grant-funded study by Yee et al (2010), titled "Concentrations of PCBs and Hg in soils, sediments and water in the urbanized Bay Area: Implications for best management." Figures and tables in that report highlight urbanized areas of the Bay with the highest PCB concentrations in sediments collected from catch basins and street curbs.

Provisions C.11.f and C.12.f strongly emphasize existing stormwater pump stations as the most likely areas for pilot diversion projects. Pump station inventory reports have been submitted to the SFB-RWQCB and compiled in tabular and GIS formats. Matching areas of high PCB concentrations in sediments with the known spatial distribution of pump stations is a useful step to efficiently make an

[4] The SFB-RWQCB has stated that diversion projects may have other benefits unrelated to PCBs and Hg (e.g., reductions in discharges of low DO water, bacteria, etc.

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initial screening of likely candidate pump stations based on potential for load reductions. Figures 3-1 through 3-6 below show the locations of pump stations, measured PCB concentrations in storm drain sediments, and POTW service areas. For illustration purposes, only sediment samples with detectable PCB concentrations are included in the figures. These planning tools can be used to assist in the evaluatation of the water quality needs criteria.

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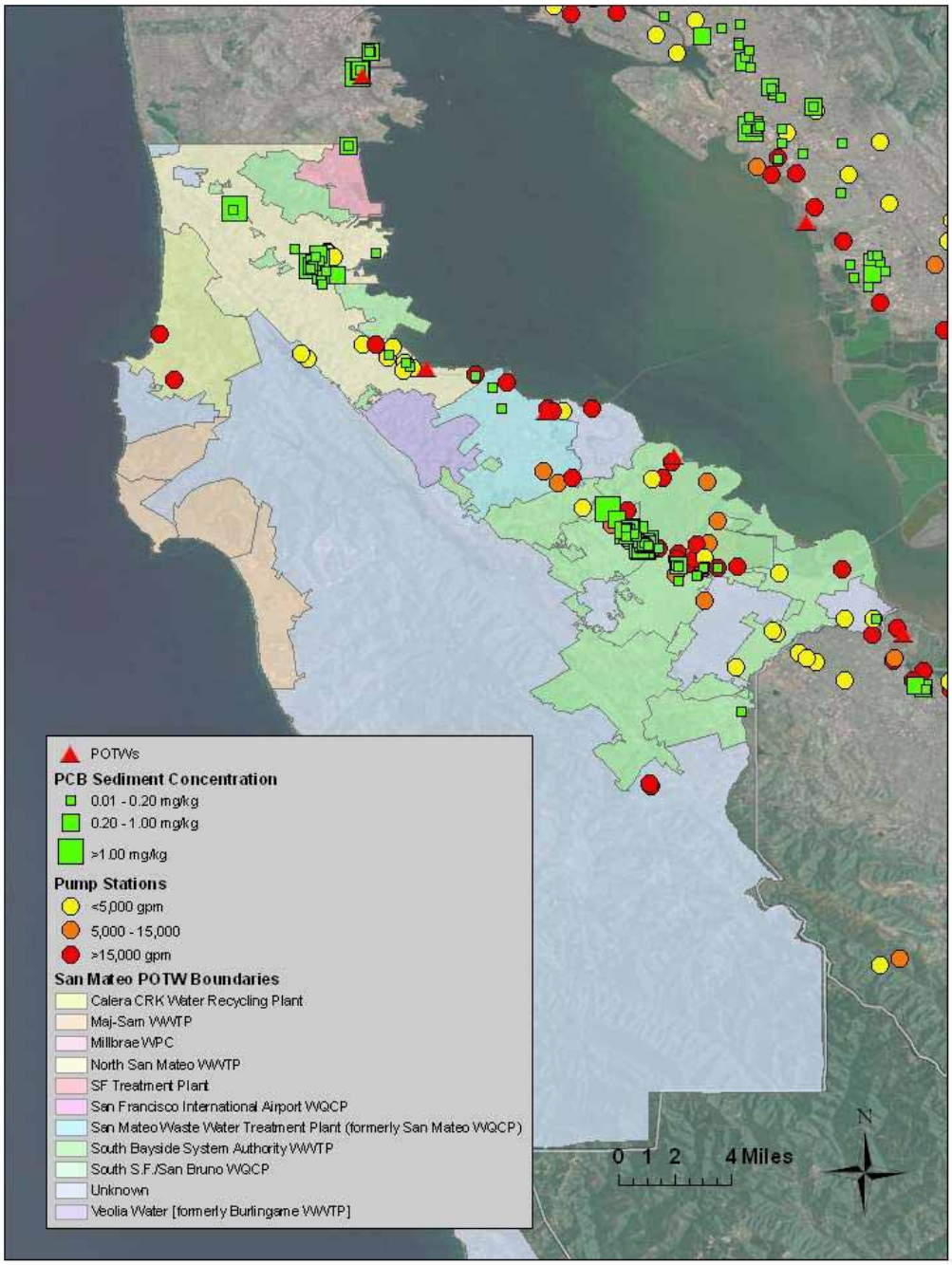

Figure 3-1. Map of Pump Station Locations, PCB concentrations in Sediments, Locations of POTWs, and POTW Service Areas in San Mateo County.

GIS layers for PCBs in sediments and pump stations courtesy SFEI. GIS layers for POTW service areas courtesy Caltrans District 4. All GIS information is preliminary; Brown and Caldwell and the GIS information providers make no guarantees as to the accuracy of GIS information provided in this report.

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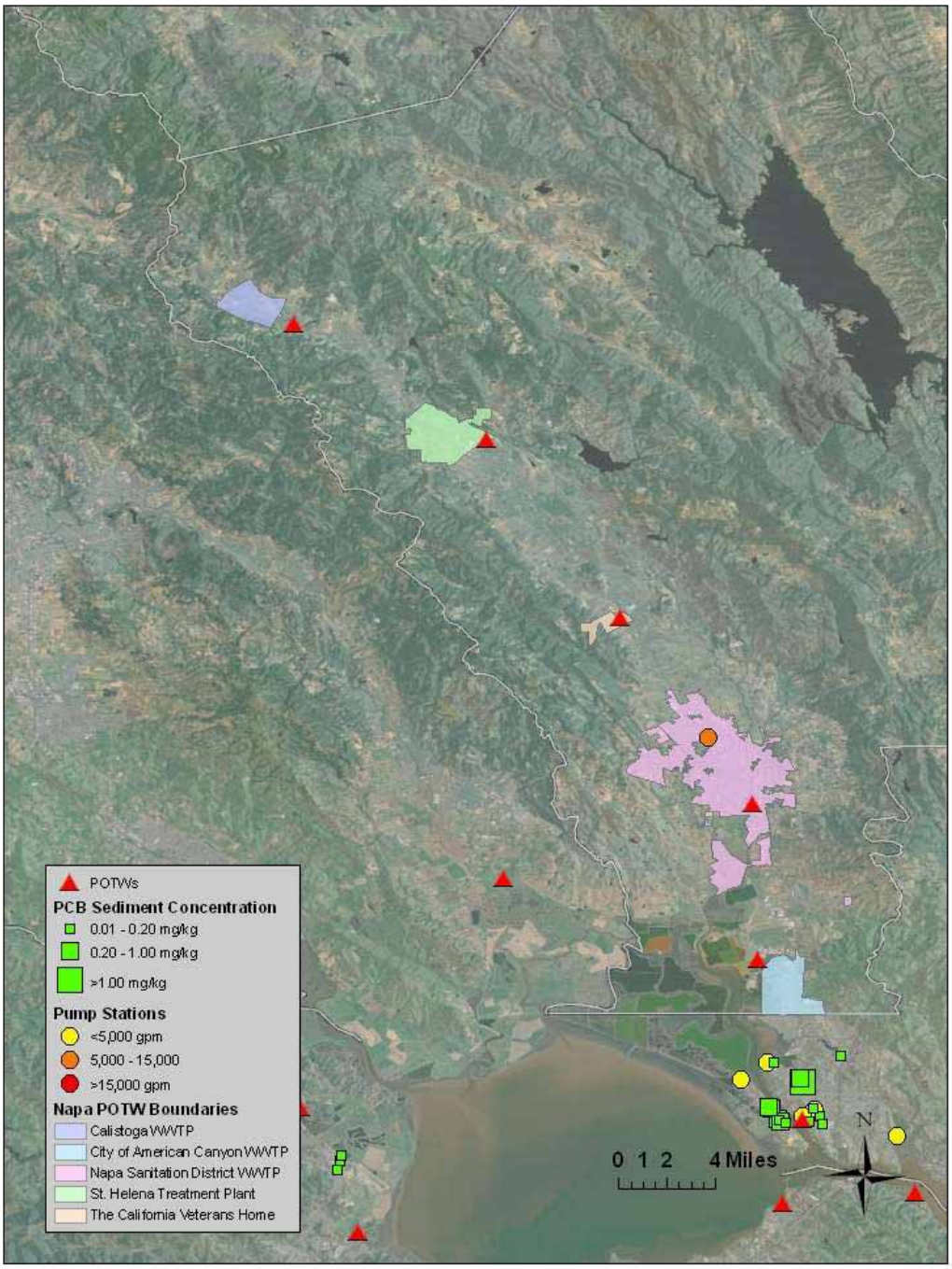

Figure 3-2. Map of Pump Station Locations, PCB concentrations in Sediments, Locations of POTWs, and POTW Service Areas in Napa County.

GIS layers for PCBs in sediments and pump stations courtesy SFEI. GIS layers for POTW service areas courtesy Caltrans District 4. All GIS information is preliminary; Brown and Caldwell and the GIS information providers make no guarantees as to the accuracy of GIS information provided in this report.

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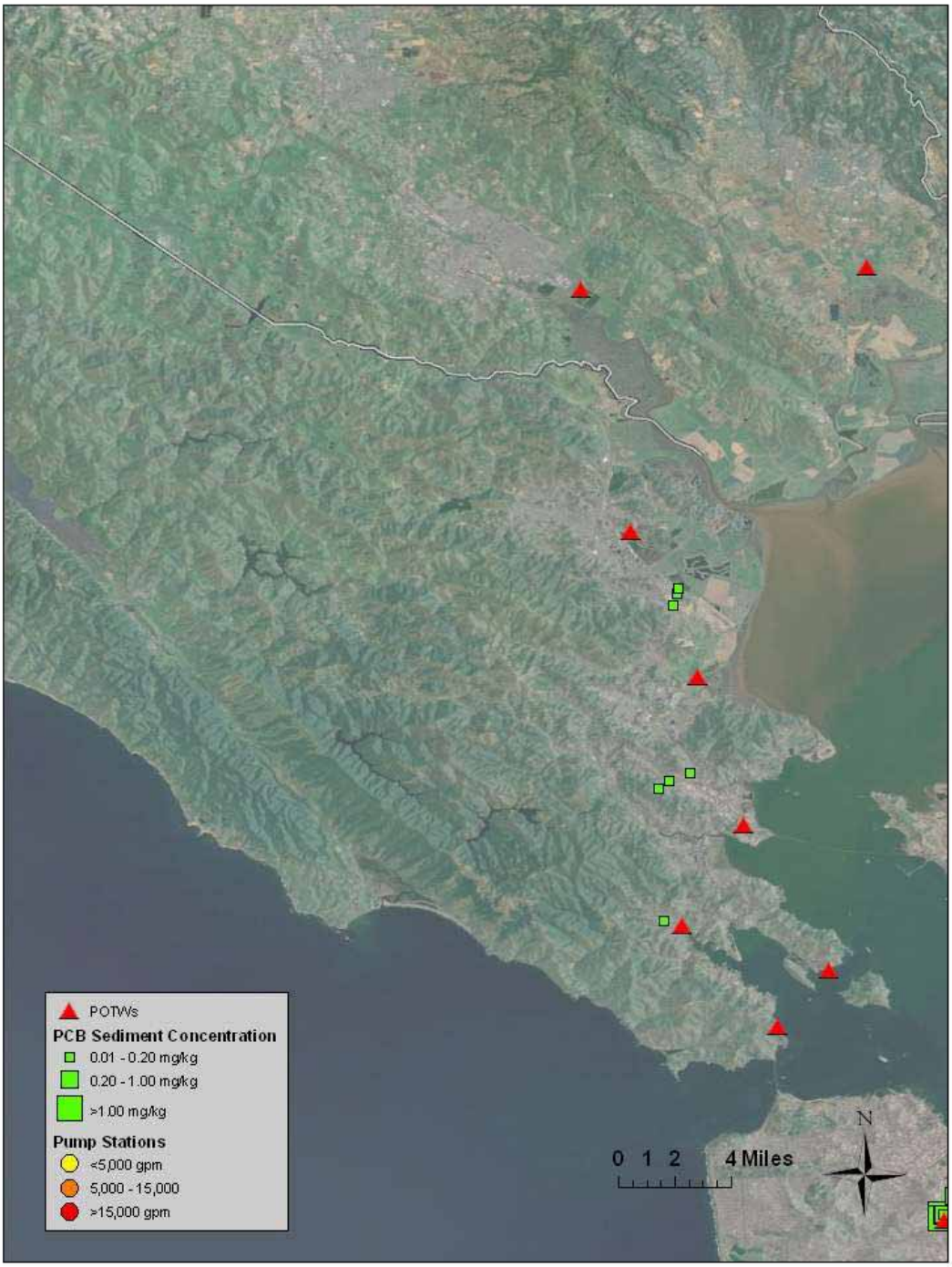

Figure 3-3. Map of Pump Station Locations, PCB concentrations in Sediments, Locations of POTWs, and POTW Service Areas in Marin County.

GIS layers for PCBs in sediments and pump stations courtesy SFEI. All GIS information is preliminary; Brown and Caldwell and the GIS information providers make no guarantees as to the accuracy of GIS information provided in this report.

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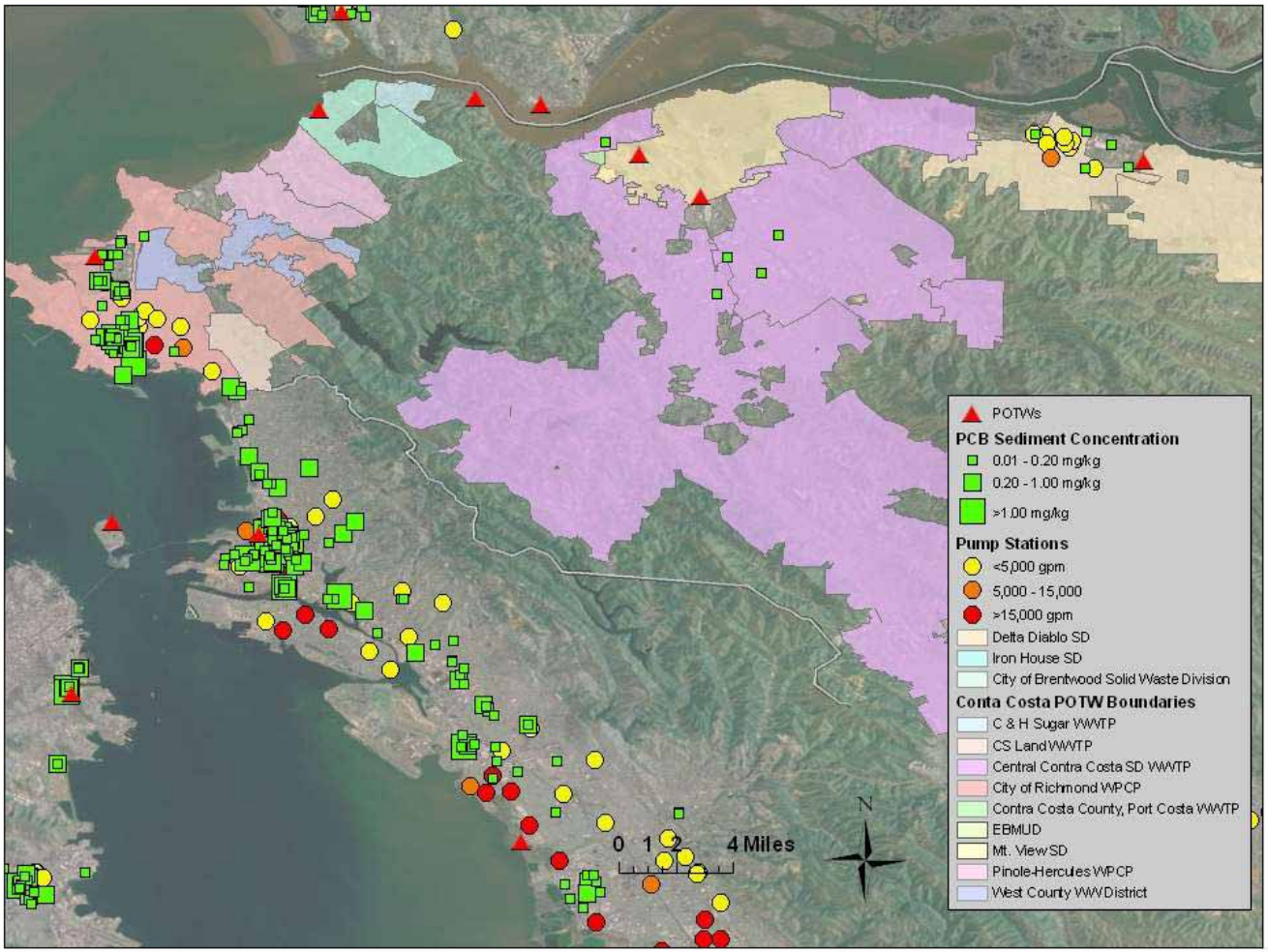

Figure 3-4. Map of Pump Station Locations, PCB concentrations in Sediments, Locations of POTWs, and POTW Service Areas in Contra Costa County.

GIS layers for PCBs in sediments and pump stations courtesy SFEI. GIS layers for POTW service areas courtesy Caltrans District 4. All GIS information is preliminary; Brown and Caldwell and the GIS information providers make no guarantees as to the accuracy of GIS information provided in this report.

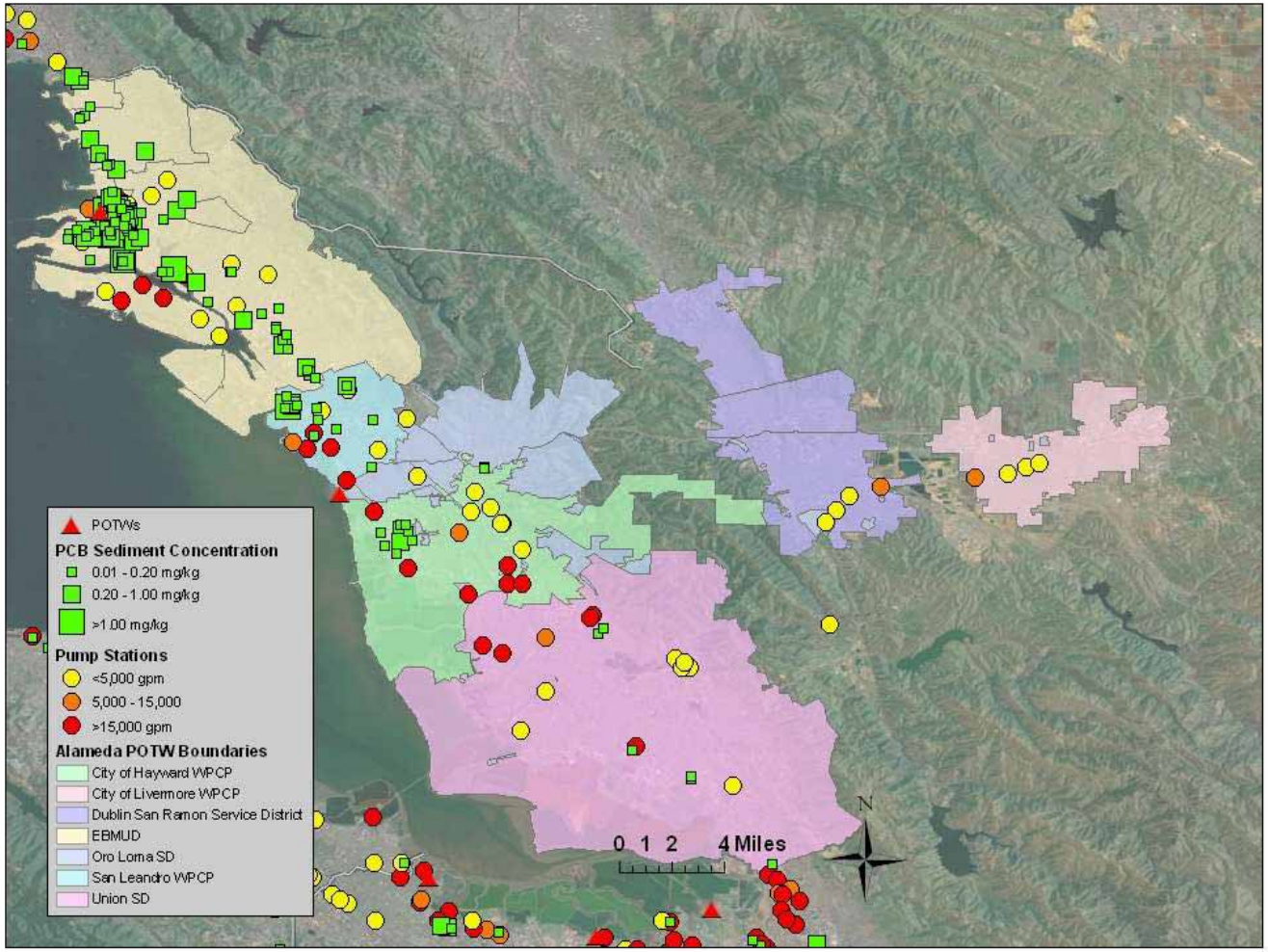

Figure 3-4. Map of Pump Station Locations, PCB concentrations in Sediments, Locations of POTWs, and POTW Service Areas in Alameda County.

GIS layers for PCBs in sediments and pump stations courtesy SFEI. GIS layers for POTW service areas courtesy Caltrans District 4. All GIS information is preliminary; Brown and Caldwell and the GIS information providers make no guarantees as to the accuracy of GIS information provided in this report.

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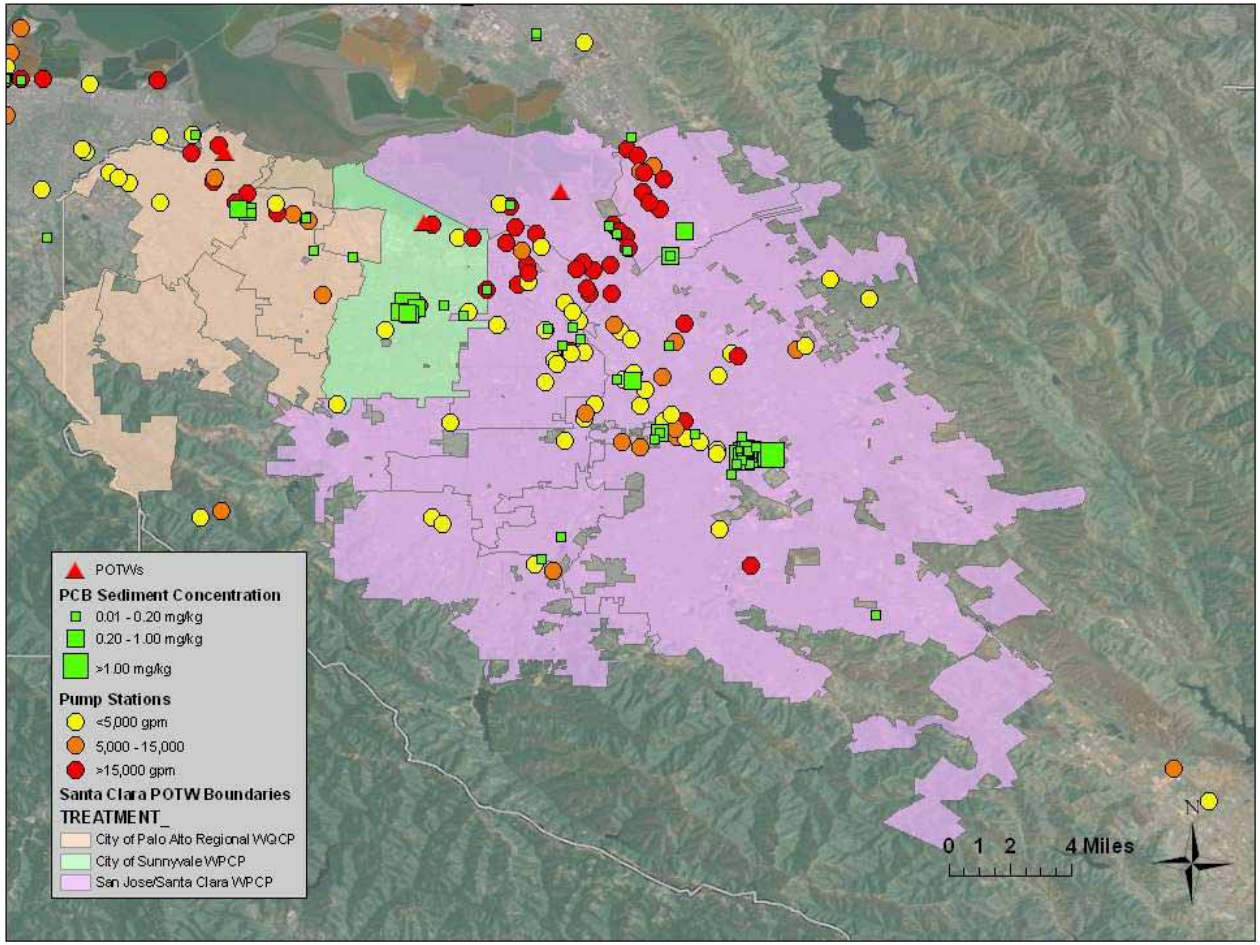

Figure 3-5. Map of Pump Station Locations, PCB concentrations in Sediments, Locations of POTWs, and POTW Service Areas in Santa Clara County.

GIS layers for PCBs in sediments and pump stations courtesy SFEI. GIS layers for POTW service areas courtesy Caltrans District 4. All GIS information is preliminary; Brown and Caldwell and the GIS information providers make no guarantees as to the accuracy of GIS information provided in this report.

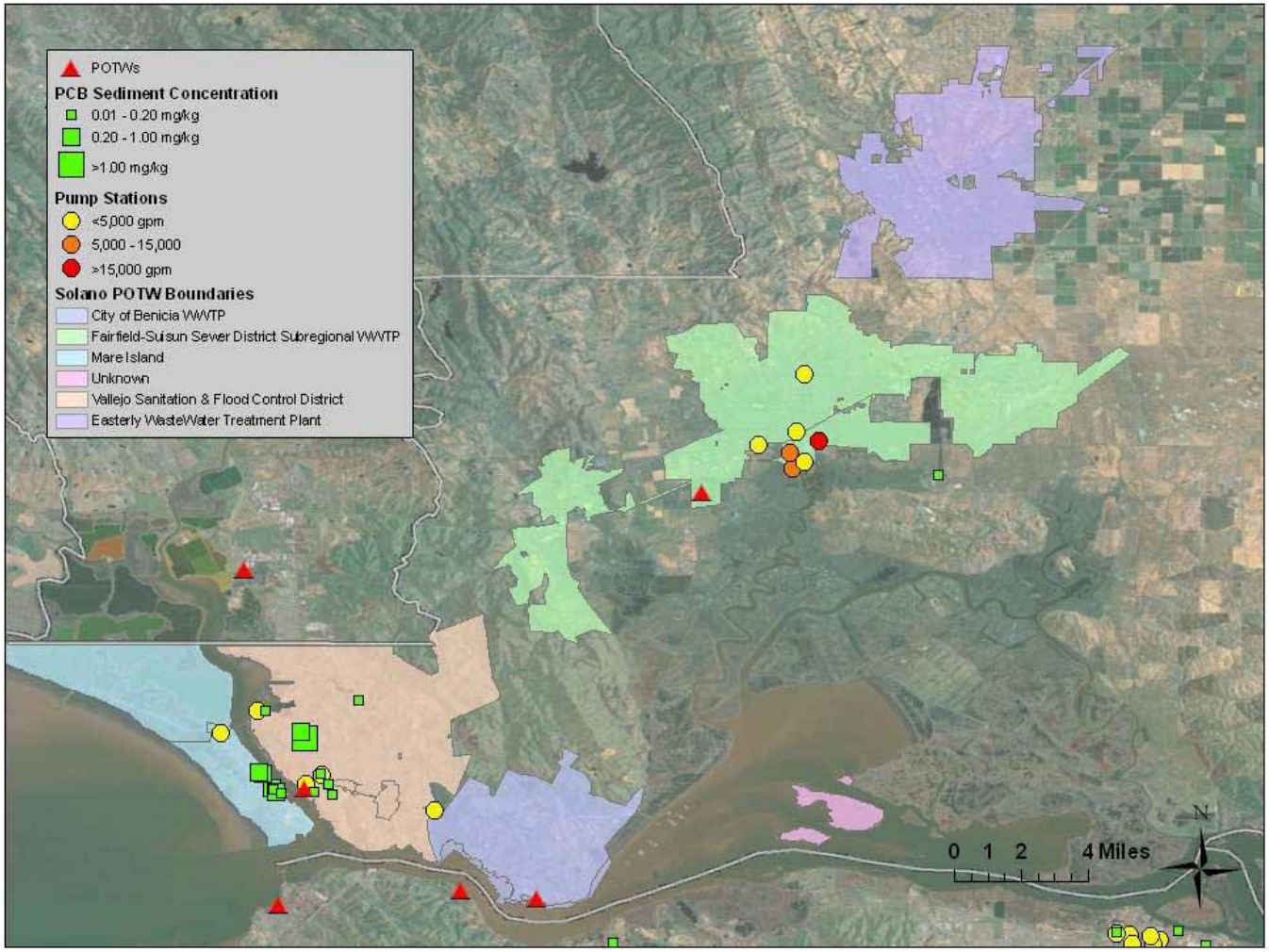

Figure 3-6. Map of Pump Station Locations, PCB concentrations in Sediments, Locations of POTWs, and POTW Service Areas in Solano County.

GIS layers for PCBs in sediments and pump stations courtesy SFEI. GIS layers for POTW service areas courtesy Caltrans District 4. All GIS information is preliminary; Brown and Caldwell and the GIS information providers make no guarantees as to the accuracy of GIS information provided in this report.

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Will the project provide unique or new information? This is a more subjective question that would require input from the Technical Oversight Committee, including the SFB-RWQCB, to properly screen. It is an important question because, given the compliance time frame and inherent scale of pilot projects, they will most likely be small and temporary in nature. Therefore, in addition to targeting opportunity areas where pump stations serves drainage areas that have high PCB concentrations, pilot projects should be designed with the intent of producing information that will be useful to assess the costs and benefits of full scale implementation.

3.1.2 Costs and Alternatives

Overall cost is an important screening crtieria for pilot projects. Some simple planning tools for determining whether or not a pilot project is cost prohibitive are presented in Section 2.4.1 above. In general, pilot projects that would require significant new conveyance infrastructure or incur significant treatment costs may be less attractive than pilot projects with relatively simple diversion connections located in jurisdictions where reduced or waived treatment costs could be negotiated.

Alternatives to diversion, such as pollution prevention, street sweeping, sediment management, and stormwater treatment retrofits, should always be considered in conjunction with diversion to POTWs. This FER is developed to comply with an MRP requirement that also prescribes five pilot projects; therefore, consideration of alternatives is not a specific screening criterion for pilot projects, although it would be an important screening criteria for additional implementation beyond the pilot stage. The oversight committee will provide input and feedback on diversion sites considering the broader regional context of pilot-testing a variety of pollutant control strategies in the Bay Area.

3.1.3 Acceptability

There are two screening criteria that should be evaluated to determine whether diversion into POTWs is acceptable:

Is there an accessible POTW willing and able to provide treatment service? A key piece of information to help identify the POTW which serves an area of interest s a map of POTW service areas, such as the examples shown in Figures 3-1 through 3-9. Additionally, Pump station inventory data compiled by the SFB-RWQCB includes partial listings of the nearest POTW. The best way to assess the willingness, existing ability and challenges of a POTW to accept a diversion is to begin discussions with the appropriate staff and collectively explore opportunities and constraints of the potential diversion in question. Because of the likely change needed to existing POTW procedures, policies, and principles, it is expected that inevitably, decision makers representing the POTW will also need to be involved and approve the pilot diversion. In order for a POTW decision maker to evaluate the request, they would need certain information, including the amount to be diverted, the expected timing and duration of the pilot diversion, and the loads of PCBs, mercury, suspended sediment, dissolved solids, and biochemical oxygen demand expected. Some of the concerns of POTWs are briefly summarized in Section 3.3 below and by the Bay Area Clean Water Agencies (Carollo, 2009)

Can the pilot diversion be sited within acceptable design criteria? This criterion would be evaluated using maps, diagrams, a site walk, and other resources necessary to complete a pre-design checklist comparable to the one illustrated in Figure 2-3. A more pertinent checklist has been developed for this FER and is shown in Table 3-1.

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Table 3-1. Proposed Checklist for Evaluating Engineering Feasibility of Pilot Diversions	
1	Does the POTW in question have existing capacity during wet weather?
2	Does the POTW in question have existing capacity during dry weather?
3	What is the distance to any potential sanitary sewer pilot diversion connections (linear feet)?
4	Does the potential connection require any land acquisition or easements?
5	Does the POTW fully own or control the sanitary sewer system?
6	Is the POTW willing to accept discharge from a stormwater pilot diversion project?
7	What is the capacity of the pump station (gpm)?
8	What is the wet weather capacity of the sanitary sewer system downstream of the potential pilot diversion connection?
9	What percentage of the pump station flow can be diverted to the sanitary sewer system if at all?
10	Does the pump station have sufficient area in either the wet well or after the pump to build a pilot diversion?
11	Would the pump station convey flow to the sanitary sewer system via gravity flow or an additional pump.

Questions 1 and 2 initially determine the feasibility of a POTW to accept stormwater flow. POTWs with little excess capacity will not likely take on stormwater discharges. If it is possible to divert water, questions 3, 4, and 5 consider the route necessary to convey water to the sanitary sewer system. Longer distance pilot diversions will likely be cost prohibitive, as well as routes which require acquisition of land or easements for construction. If the POTW does not own the sanitary sewer system, or shares ownership, negotiations for sanitary sewer capacity and the timing of discharges would involve more parties, and likely be more complex. Questions 6, 7, and 8 determine the capacity of the sanitary sewer system at a chosen pilot diversion point, to accept, some, all, or none of the wet or dry weather flow from the diversion. Of particular concern is whether accepting a diversion would increase the risk of a Sanitary Sewer Overflow (SSO). Finally, questions 9 and 10 determine whether the pump station itself is amenable to retrofit for pilot diversion. Pump stations in small areas with limited space for expansion would likely be ill-suited to build a flow control device for gravity flow to a sanitary sewer connection. In stations with small wet well capacity it would be difficult to install new pumps for conveyance.

Table 3-2 below summarizes the selection criteria, and the information needed to apply the criteria.

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Table 3-2. Proposed Selection Criteria and Information Needed		
Criteria		Information Needed
Needs	Will the project yield a significant PCB load reduction?	PCB concentrations in sediments from the local drainage; Pump station inventories in GIS and tabular formats Event-mean PCB concentrations in stormwater; TSS and flow measurements; Drainage area assessments
	Will the project provide unique or new information?	Peer review from Technical Oversight Committee
	Does a pilot project fit into the broader regional context of pilot-testing a range of pollutant control strategies, including pollution prevention, site remediations, enhanced sediment management, and stormwater treatment retrofitting strategies?	Peer review from Technical Oversight Committee
Costs and Alternatives	Are the capital and operation and maintenance costs associated with diversion prohibitive?	Site investigations Conceptual designs and drawings Preliminary site-specific cost estimates Treatment and connection costs/charges.
	Are there ways to control upstream sources of PCBs through remediation, removal, isolation, or run-on diversion?	Source identification studies Peer review from Technical Oversight Group
	Can onsite treatment or infiltration retrofits be implemented?	Site investigations, including right-of-way mapping
Acceptability	Is there an accessible POTW willing and able to provide treatment service?	POTW service area map Communication with POTW managers
	Can the pilot diversion be sited within acceptable design criteria?	Pre-design checklist assessment (Table 1)

3.2 Cost and Benefit Analysis of Three Scenarios

This section evaluates three hypothetical scenarios to estimate the costs, grams of PCBs removed, and resulting cost per gram. These scenarios are hypothetical, based on untested assumptions and may not represent actual conditions or costs associated with stormwater pump station diversions in the Bay Area. Additionally, these scenarios are intended to only represent a range of possible costs and benefits that may be expected. Costs and benefits are evaluated in the context of three types of scenarios that are inherently different in scale and implementation timeframes. For those scenarios with longer implementation timeframes, costs can be spread out accordingly and therefore provide an unequal comparison against scenarios with shorter implementation durations. For these reasons, costs should not be used to directly compare the cost efficiencies between scenarios presented, but rather used to assess the range of costs that may be expected for an individual scenario. Constructed Pilot Diversions

Under this scenario, it is assumed that a pilot diversion is constructed which includes operational controls that allow selective pilot diversion of first flush and wet weather events. The pilot diversion is assumed to require minimal distance to tie into the sanitary sewer system. The pilot diversion is assumed to be a gravity feed into a large capacity sewage line, requiring minimal annual O&M costs due to electricity. The receiving POTW has agreed to accept one million gallons per 24-hour storm event no more than eight times during the storm season. It is assumed, for this hypothetical scenario, that the

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POTW has agreed to waive treatment fees[5]. A pilot diversion and pump system has been constructed which can convey large volumes of flow (750 gpm to deliver one million gallons in 24 hours). Based on Table 2-1, the capital outlay for this project is assumed to be $750,000. The removal effectiveness for PCBs and Hg is assumed to be >95 percent.

If the average PCB concentration in diverted stormwater were 50 ng/L, each million gallons diverted would reduce PCB loads discharged directly to the Bay by 0.2 grams (see Table 2-4). Eight such events each year would annually reduce PCB loads by 1.6 grams. Over twenty years, this would correspond to 32 grams of PCBs (assuming concentrations would remain unchanged over this timeframe).

Assuming that a ten-fold higher stormwater mercury concentration (500 ng/L), this would correspond to a load reduction of 16 grams of mercury per year, or 320 grams over twenty tears.

If the treatment plant provides treatment service for free, then achieving a total load reduction of 32 grams PCBs and 320 grams mercury over twenty years by this approach would result in a capital outlay and operation and maintenance cost of approximately $23,500 per gram of PCBs reduced, and $2,350 per gram of mercury reduced. This estimate is a very crude, demonstrative example that does not consider life-cycle costs, net present worth cost adjustments, or other complexities. The cost per gram would increase substantially if the hypothetical pilot diversion were to be terminated in less than twenty years.

3.2.1 Non-constructed Pilot Diversions

Under this scenario, it is assumed that a wet weather pilot diversion project that does not require the construction of diversion structures, but rather is implemented using check dams and pumps to divert storm flows into storage tanks, and subsequently routing into a sanitary sewer when there is sufficient capacity. Because no capital costs incurred under this scenario, municipalities diverting stormwater have less financial risk compared to the first scenario described. It is assumed that sufficient site area is available to locate ten storage tanks, and that the site area has pavement competent to withstand the weight of ten full tanks. The project is assumed to last for thirty days, and the daily cost of equipment rental and staffing is $6,000, for a total project cost of $180,000 (per Table 2-3). As with the constructed pilot diversion scenario above, treatment fees are assumed to be waived for this scenario[5]. The project is assumed to occur in the wettest months (i.e., January – February), and for the purposes of this scenario is assumed to capture a total of three major storm events, diverting a total of 600,000 gallons of wet weather flows (200,000 gallons each event) having an average PCB concentration of 50 ng/L.

Referring to Table 2-4, each 200,000 gallon pilot diversion event would capture 0.04 grams of PCBs, for a total of 0.12 grams diverted into the POTW. Again assuming 95 percent removal, this would yield a net load reduction of 0.11 grams, or 0.0006 percent of the total currently estimated PCB stormwater load. Although the total project cost is lower compared to construction of a constructed pilot diversion, the cost per gram removed is significantly higher: approximately $1,600,000 per gram of PCBs removed.

Assuming a ten-fold higher Hg concentration (500 ng/L), the net load reduction would be 1.1 grams for this scenario, at a cost of $160,000 per gram.

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[5] The simplifying assumption that a POTW waives treatment fees is, in fact, unlikely. In most cases, wastewater and stormwater programs are funded through separate sources, and so institutional factors may make such a waiver problematic. As noted in Tables 2-1 and 2-2 above, connection fees typically range from $9,000 to $18,000 per thousand gallons per day, and treatment fees typically range from $300 to $2,400 per MG treated. As a result, these cost estimates for the hypothetical scenarios are llikely underestimated. Other charges may also be assessed, such as East Bay MUD's "wastewater capacity fee" of at least $97.40 per 100 cubic feet per month, or $130,000/MG/month. See, for example: http://www.ebmud.com/our-water/wastewater-treatment/wastewater-treatment-programs/wastewater-rates-charges-and-fees

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3.2.2 Conveyance System Cleanout

Under this scenario, it is assumed that a sediment sampling and visual inspection has identified a conveyance with contaminated sediments. A cleanout of the impacted portion of the system takes place over a period of seven days, at a lower cost ($4,000 per day) than the wet weather pilot diversion because the dry weather work can be more easily scheduled. A total of ten kilograms of contaminated sediments having an average PCB concentration of ten parts per million (10 mg /kg) is flushed from the system and captured in a single, 20,000 gallon storage tank, and then discharged into the sanitary sewer. Again, treatment fees are assumed to be waived for this analysis[5]. Under this scenario, the total mass of PCBs removed would be 100 mg, or 0.1 grams. If 95 percent of the PCB load discharge to the POTW is removed by treatment, the net load reduction benefit to the Bay would be 0.095 grams. The total project cost is $28,000. The cost per gram of PCBs removed under this scenario would be approximately $300,000 per gram.

Under this scenario, it is assumed that sediment with 10 mg/kg PCBs have mercury concentrations of 1 mg/kg. This assumption reflects the observations that sediments from old industrial areas that are substantially contaminated with PCB are not typically found in the same locations as sediments impacted by mining waste that have mercury concentrations of 10 mg/kg or more. The corresponding load reduction of mercury would be 0.01 grams, at a cost of $3,000,000 per gram.

Although this third scenario is the most cost-effective, in terms of cost per gram, and also one of the most likely scenarios to be acceptable to a POTW, the overall load reduction is still relatively small – again about 0.0005 percent of the total stormwater PCB load to the Bay. Additionally, this scenario (and non-constructed diversions) allow municipalities to be more adaptive in directing resources where they are most needed. This scenario could, however, be a useful diagnostic tool. If, after conducting the cleanout, follow-up inspections show that contaminated sediments are again found in the conveyance system after the rainy season ends, that would suggest a need to look upstream to possibly identify areas where sediment removal, capping, and/or run-on pilot diversion could be implemented to protect the stormwater conveyance system.

3.3 POTW and Collection System Agency Constraints/Concerns

A draft white paper developed by the Bay Area Clean Water Agencies presents a summary of constraints faced by POTWs when deciding whether or not to accept stormwater discharges for treatment (BACWA, 2009). Those issues have been raised in previous technical reports submitted to the SFB-RWQCB (e.g., Applied Marine Sciences, 2003).

Some of the main constraints faced by POTWs include:

Treatment capacity and conveyance system capacity - The BACWA (2009) white paper noted that most treatment and conveyance system capacity issues could be addressed by restricting diversion flows. Restirctions could be achieved through the design of orifices, weirs, and pumps. As noted in the cost / benefit analysis, treatment and conveyance and capacity issues may limit the load reduction benefits attainable.

Conveyance system ownership and permission of all owners - Not all POTWs own the collection and conveyance systems that serve them. If a different entity than the POTW owns the collection system, it would require another negotiation to enable the diversion. If there are multiple collection system owners, the negotiation could be more complex.

Ordinance prohibitions - The BACWA (2009) white paper notes that:

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> "There are few existing agreements and local laws (e.g. ordinances) that relate to stormwater diversions, including a POTW's ability to accept, deny or condition the acceptance of stormwater diversions (e.g. flow restrictions, pretreatment requirements). Most wastewater agencies operating separate sanitary sewers currently forbid the discharge of stormwater into the sanitary system. However, many wastewater agencies have a stipulation in their rules that allow discharges to the sanitary system with the permission of the POTW."

Potential to upset biological processes, especially in advanced treatment plants. Introduction of heterogeneous surface waters puts a POTW at risk of treatment system upsets, particularly in advanced plants where inoculations of foreign bacteria can interfere with microbial communities essential to the treatment process.

Effect of PCB loads on effluent - In its report on the Ettie Street Pump Station diversion project (EBMUD, 2010), EBMUD noted that PCB loads to influent are not 100% removed by the treatment process. As a result, EBMUD stated that the compliance with respect to "PCBs and other pollutants for which the Bay is impaired would require particularly close evaluation for diversion potential." There is only a small, preliminary amount of data available on current concentrations of PCBs in treated effluent (SFRWQCB, 2008) . However, the limited amount of information available indicates that PCB concentrations in treated effluent are likely to be above water quality objectives for PCBs established in the California Toxics Rule.

Effect of PCB loads on biosolids - Initial discussions with the Technical Oversight Committee (July 14, 2010) led to the conclusion that PCB loads from pilot diversion projects may be sufficiently small that they would not significantly change the PCB concentration of biosolids. The preliminary load calculations in Section 3.2 tend to support this – conveyance system and treatment plant capacity would likely become limiting factors before PCB concentrations in biosolids would be a constraint. However, it is worth noting that deliberate introduction of PCBs into sewage treatment systems has strong potential to cause perception problems related to biosolids. For example, a recent incident in Milwaukee, Wisconsin led to the inadvertent introduction of PCB contaminated sediments in to the municipal sewage treatment system during a sanitary sewer system rehabilitation project (Behm, 2009). As a result, commercial production and sale of biosolids from the treatment plant was halted for several months. Recovery from the incident caused the Milwaukee Metropolitan Sewerage District approximately $4 million.

3.4 Conceptual Framework for Crediting PCB Load Reductions

The MRP requires that this FER include "a proposed method for distributing PCBs load reductions to participating wastewater and stormwater agencies." proposed approach for crediting mercury and PCB load reductions to POTWs. This section proposes a method for illustrative purposes, in order to comply with the NPDES permit. Any program of incentives or credits to POTWs would need to be developed with POTW involvement.

The effect of a diversion on compliance would be of particular concern. For example, in its report on the Ettie Street Pump Station pilot diversion project (EBMUD, 2010), EBMUD noted that PCB loads to influent are not 100 percent removed by the treatment process. As a result, EBMUD stated that the compliance with respect to "PCBs and other pollutants for which the Bay is impaired would require particularly close evaluation for pilot diversion potential."

There is only a small, preliminary amount of data available on current concentrations of PCBs in treated effluent (SFB-RWQCB, 2008) . However, the limited amount of information available indicates that PCB concentrations in treated effluent are likely to be above water quality objectives for PCBs established in the California Toxics Rule. The San Francisco Bay PCBs TMDL has established WLAs for PCBs in treated effluent that add up to 2 kg per year for all Bay Area wastewater dischargers combined. The estimated current loads are slightly higher, 2.3 kg per year. The SFB-RWQCB has stated that it expects PCB

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concentrations in effluent to decrease over time as a result of the fact that PCBs are no longer manufactured or used. Recognizing that pilot diversion projects would increase PCB loads to POTWs, the SFB-RWQCB also included a 1 kg per year WLA to be made available to individual POTWs who agree to accept stormwater for discharge.

IN the staff report accompanying the San Francisco Bay PCBs TMDL, the explanation for the 1 kg per year WLA available for stormwater treatment is as follows:

> "A potential means to reduce urban stormwater runoff PCBs loads will be to strategically intercept and route runoff to municipal wastewater treatment systems. We propose a separate wasteload allocation for discharges associated with urban stormwater runoff treatment via municipal wastewater treatment systems, since such actions will result in increased PCBs loads from municipal wastewater dischargers, and the proposed individual wasteload allocations for municipal wastewater dischargers reflect current performance levels. We propose a wasteload allocation of 0.9 kg/yr, which is the difference between the TMDL of 10 kg/yr and the sum of the other proposed wasteload and load allocations."

The proposed method is to credit the participating stormwater permittee for the estimated load diverted as progress towards attainment of the TMDL wasteload allocation. Participating POTWs would likely seek some form of regulatory protection from effluent limit exceedances or system upsets caused by the pilot diversions. The SFB-RWQCB could consider offering some of the 1 kg per year WLA as an incentive for POTW participation. A crediting ratio could be proposed to allow a small increase in POTW loads in comparison to the stormwater loads removed. For example, if the crediting ratio were 10:1, then the 1.6 grams of PCBs removed annually under Scenario 1 above would allow the participating POTW to increase loads by 0.16 grams per year. A crediting ratio of 10:1 would allow for a 90 percent removal efficiency by the POTW: for every ten additional grams of PCBs in stormwater treated by the POTW, an addtiional one tenth of a gram would be discharged, resulting in a net PCB load reduction. The SFB-RWQCB would likely need to seek input and buy-in on this concept from the United States Environmental Protection Agency, as well as local environmental stakeholders, to incorporate this or any other crediting framework into NPDES permits.

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Section 4

Process and Schedule for Pilot Project Implementation

A proposed timeline for pilot project implementation is shown in Table 4-1 below. This FER completes Task 1, which is led by a BASMAA as a regional project. Task 2.0 will begin upon submittal of this FER. Copermittees, with some assistance from BASMAA as needed, would use this report to propose five candidate and five alternate pump stations for pilot projects. A technical memorandum summarizing the candidate and alternate pump stations would be submitted to the SFB-RWQCB by September 15, 2011. After that time, preliminary designs and cost estimates for the pilot diversions would be advanced.

Sampling and analysis plans would be developed though a regional project. Progress would be summarized in Annual Reports submitted by BASMAA to the SFB-RWQCB. The MRP requires a final report to be completed by March 15, 2014.

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Table 4-1. Proposed Schedule for Pilot Project Implementation

Task	Programs/ Permittees	Regional	Suggested Start Date	Suggested End Date
1.0 – Feasibility Evaluation				
1.1. Develop draft list of criteria that should be considered when selecting areas or stormwater pump stations for potential pilot diversions to POTWs, and associated data/information needed to apply the criteria.	A	X	May 15, 2010	July 21, 2010
1.2 Develop a preliminary cost and benefit assessment for three (?) types/configurations of areas or pump stations using existing data and information	A	X		
1.3 Develop draft methodologies for distributing loads between POTWs and stormwater programs when diverting areas or pump station discharges to POTWs.	A	X		
1.4 Summarize criteria, cost benefit analysis, and loads methodology in a report and include a time schedule for selection and implementation of pilot diversions.	A	X		Draft – August 11, 2010 Final – September 15, 2010
2. 0 Pump Station Retrofits				
2.1 Apply criteria developed in Task 1.1 and select a minimum of 5 primary and 5 alternate pump stations or areas (2 per county) that will be considered for pilot diversion.	X	A	September 8, 2010	February 28, 2011
2.2. Develop memorandum summarizing pump stations or areas selected in task 2.1 above and a refined cost benefit assessment for these pump stations or areas.	A	X	March 1, 2011	Draft – May 15, 2011; Final – August 15, 2011
2.3 Further scope pilot diversion infrastructure needs, and develop preliminary/conceptual design (5 percent) and engineering for pump stations or areas selected in Task 2.1.	X	A	June 1, 2011	December 1, 2011
2.4 Refine conceptual design into 30 percent level of design and acquire permits/agreements as needed.	X	A	December 1, 2011	December 11, 2012
2.5 Retrofit existing pump stations or areas to allow for pilot diversion to POTW (i.e., construction) under predefined conditions	X	A	January 21, 2013	June 1, 2013
3.0 Monitoring				
3.1 Develop regional sampling and analysis plan (Including a QAPP and SOP) and data reporting templates	A	X	July 1, 2011	June 30, 2013
3.2 Monitor diversions (early implementation may be possible at some stations)	X	A	July 1, 2013	January 31, 2014
3.3 Conduct QA/QC, data analyses	A	X	July 1, 2013	February 28, 2014
4.0 Reporting				
4.1 Summarize pilot diversion project status/progress in Annual Report	X	A	July 1, 2010	September 15, 2014
4.2 Prepare summary report for inclusion in integrated report	A	X	January 2, 2014	March 15, 2014

Notes: A = Assist; X = Task Lead. Monitoring results produced after December 1, 2013 may not appear in the March 15, 2014 Integrated Report submittal.

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Section 5

Limitations

This document was prepared solely for the BASMAA in accordance with professional standards at the time the services were performed and in accordance with the contract between BASMAA and Brown and Caldwell dated June 3, 2010. This document is governed by the specific scope of work authorized by BASMAA; it is not intended to be relied upon by any other party except for regulatory authorities contemplated by the scope of work. We have relied on information or instructions provided by BASMAA and other parties and, unless otherwise expressly indicated, have made no independent investigation as to the validity, completeness, or accuracy of such information.

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Attachment 1. List of Major POTWs in the Bay Area							
NPDES Permit	POTW	Area	Outfall	Agencies	Service Population	Dry Weather Design Flow (mgd)	Biosolids Disposal Methods
CA0038318	SF International Airport Mel Leong Treatment Plant	San Mateo County	NBSU	SF International Airport	Commercial Airport	2.20	Landfill
CA0038130	Cities of South San Francisco and San Bruno WQCP	San Mateo County	NBSU	City of S. San Francisco, San Bruno, Daly City, Colma	106,000	13.00	Landfill
CA0038369	South Bayside System Authority WWTP	San Mateo County	Same	West Bay Sanitary District, City of Belmont, San Carlos, Redwood City, Woodside and San Mateo County	217,000	29 mgd	Landfill
CA0037532	City of Millbrae WPCP	San Mateo County	NBSU	City of Millbrae	22,000	3.00	Landfill/Land Application
CA0037788	City of Burlingame WWTF	San Mateo County	NBSU	Burlingame, Hillsborough, San Mateo County	37,000	5.50	Landfill/Land Application
CA0037541	San Mateo WWTP	San Mateo County	Same	City of San Mateo, Foster City, Hillsborough, Belmont; San Mateo County	137,000	15.70	NA
CA0037613	Dublin/San Ramon Services District	Alameda County	LAVWMA/EBDA	DSRSD, City of Pleasanton	NA	17.00	NA
CA0038008	Union Sanitary District Alvarado WWTP	Alameda County	EBDA	City of Fremont, Newark, Union City	320,000	33.00	Landfill
CA0038008	Livermore WRP	Alameda County	LAVWMA/EBDA	City of Livermore, Ruby Hill (Pleasanton)	NA	8.50	Landfill/Land Application
CA0037869	Hayward WPCF	Alameda County	EBDA	City of Hayward	140,000	16.50	Landfill/Land Application
CA0037869	San Leandro WPCP	Alameda County	EBDA	City of San Leandro	50,000	7.60	Landfill
CA0037869	Oro Loma/Castro Valley Sanitary Districts WPCP	Alameda County	EBDA	San Lorenzo, Ashland, Cherryland, Fairview, Castro Valley; City of San Leandro and Hayward	126,000	14.90	Landfill
CA0037702	EBMUD WPCP	Alameda County	Same	City of Albany, Alameda, Berkeley, Emeryville, Oakland, Piedmont; Stege Sanitary District	636,635	120.00	Landfill/Land Application
CA0037834	Palo Alto Regional WQCP	Santa Clara County	Same	City of Los Altos, Los Altos Hills, Palo Alto, Mountain View, East Palo Sanitary District; Stanford University	228,500	39.00	Incineration

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Attachment 1. List of Major POTWs in the Bay Area							
NPDES Permit	POTW	Area	Outfall	Agencies	Service Population	Dry Weather Design Flow (mgd)	Biosolids Disposal Methods
CA0037842	San Jose/Santa Clara WPCP	Santa Clara County	Same	City of San Jose, Santa Clara, Milpitas; SCC CSD No. 2 and 3; WVSD, Campbell Los Gatos, Monte Sereno, Saratoga; and Cupertino, Burbank and Sunol Sanitary Districts	1,365,000	167.00	Landfill/Land Application
CA0037621	Sunnyvale WPCP	Santa Clara County	Same	City of Sunnyvale, Rancho Rinconada, Moffett Field	136,000	29.50	Landfill/Land Application
	South County RWWT Authority	Santa Clara County					
CA0037826	Rodeo Sanitary District WPCF	Contra Costa County	Same	City of Rodeo and Tormey	NA	1.14	NA
CA0037648	Central Contra Costa Sanitary District WWTP	Contra Costa County	Same	Contra Costa County	445,000	53.80	NA
CA0038539	West County Wastewater District Treatment Plant	Contra Costa County	West County Agency (WCA) Common Outfall	City of Richmond, San Pablo, Tara Hills, Rollingwood, Bayview, El Sobrante, Pinole, CC County	90,000	12.50	NA
CA0037796	Pinole/Hercules WPCP	Contra Costa County	Rodeo Sanitation District	City of Pinole and Hercules	NA	4.06	Landfill
CA0005240	C&H Sugar WWTP	Contra Costa County	Same	C&H Sugar, Crockett Community Services District	NA	0.30	Off-site disposal
CA0038539	Richmond Municipal Sewer District WPCP	Contra Costa County	West County Agency (WCA) Common Outfall	City of Richmond, Richmond Municipal Sewer District No. 1	68,000	16.00	NA
CA0037770	Mt. View Sanitary District WWTP	Contra Costa County	Same	Mt. View Sanitary District	25,000	3.20	NA
CA0038547	Delta Diablo Santitation District WWTP	Contra Costa County	Same	Pittsburg, Antioch, Baypoint	189,000	16.50	Landfill/Land Application
CA0037885	Port Costa WWTP	Contra Costa County	Same	Port Costa	182	0.03	CCCSD
CA0038024	Fairfield-Suisun Sewer District WWTP	Solano County	Same	City of Fairfield, City of Suisun, Solano County	132,500	17.5	Landfill/Land Application
CA0037699	Vallejo Sanitation and Flood Control District WWTP	Solano County	Same	NA	NA	15.50	NA

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A5

Methods for Quantifying Mercury and PCB Loads Reduced From Urban Stormwater Runoff

Assessing municipal stormwater program progress towards TMDL wasteload allocations through control measure implementation

Working Draft Technical Memorandum

DRAFT

Prepared for

Bay Area Stormwater Management Agencies Association (BASMAA)

Prepared by:
EOA, Inc.
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September 10, 2010

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List of Abbreviations

BASMAA	Bay Area Stormwater Management Agencies Association
LA	TMDL Load Allocations
MPC	Monitoring and Pollutants of Concern
MRP	Municipal Regional Stormwater NPDES Permit
MS4s	Municipal Separate Storm Sewer Systems
NPDES	National Pollutant Discharge Elimination System
PCBs	Polychlorinated Biphenyls
POTWs	Publicly owned Treatment Works
SFEI	San Francisco Estuary Institute
TMDL	Total Maximum Daily Load
WLAs	TMDL Wasteload Allocations

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PREFACE

This working draft technical memorandum (TM) was developed under the direction of the Bay Area Stormwater Management Agencies Association (BASMAA) and its associated member agencies. This TM is a working draft that is only intended to demonstrate initial concepts regarding methods for quantifying mercury and PCB loads reduced from urban stormwater runoff in the San Francisco Bay Area. This TM should not be construed as a complete or finalized product, but rather a work-in-progress. Methods discussed in the TM are a result of a preliminary review of applicable literature and initial loads reduced formula development. The literature review will continue and loads reduced formulas will be updated in the future based on comments received from stakeholders.

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EXECUTIVE SUMMARY - TO BE COMPLETED

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1.0 INTRODUCTION

Municipalities in the San Francisco Bay Area (Bay Area) implement numerous measures at the local level in an attempt to control pollutants (e.g., mercury, PCBs, trash and pesticides) from entering urban stormwater runoff and receiving water bodies (e.g., local creeks, the Bay, and Pacific Ocean). Additionally, through tracking, lobbying and direct participation in task forces and committees, municipalities support and influence the development of pollutant control measures[1] that are implemented at the State or national level through regulatory solid and hazardous waste programs (e.g., mercury product recycling programs). These control measures serve as the best management practices (BMPs) municipalities and flood control agencies can implement to reduce potential adverse impacts to beneficial uses (e.g., fish consumption, recreation, and fisheries habitat) of water bodies in the region.

The effectiveness of these control measures can be evaluated in many ways (CASQA 2007, Strecker et al. 2001), but generally requires the collection and/or tracking of data and information that is directly related to the desired result or outcome of implementing the control. With regard to urban stormwater runoff, the effectiveness of a control measure is generally measured using one or more of following three methods:

1. Increases in Awareness/Behavior - Estimating or quantifying changes in awareness, knowledge or behavior of individuals or populations of individuals;
2. Loads Reduced from Sources - Quantifying reductions in the mass (loads) of pollutants from sources entering stormwater; and
3. Runoff and Receiving Water Improvements - Empirical measurements of water quality (stormwater or receiving water) improvements.

Since stormwater pollution is an issue generally created by the actions of residents or businesses, Bay Area urban stormwater management programs (stormwater programs) have historically used surveys and inspections to assess changes in awareness or behaviors, or water quality monitoring data to evaluate improvements in runoff or receiving water quality. As an alternative approach, this technical memorandum presents preliminary methodologies to quantify the load reductions for priority Pollutants of Concern (POCs) from specific urban stormwater runoff control measures. These methodologies are presented here in preliminary form, as a way to assess progress towards regulatory goals promulgated as Total Maximum Daily Load wasteload allocations for mercury and polychlorinated biphenyls (PCBs) and incorporated into Provisions C.11 and C.12 of the Municipal Regional Stormwater Permit (MRP).

1.1 Regulatory Background

1.1.1 PCBs and Mercury Total Maximum Daily Loads (TMDLs)

Based on a determination of water quality impairment of the San Francisco Bay by Polychlorinated Biphenyls (PCBs) and mercury, the San Francisco Bay Regional Water Quality Control Board (Regional Board) recently developed Total Maximum Daily Loads (TMDLs) for these pollutants. The purpose of the TMDLs is to attain water quality standards that will protect sport fishing, human health, aquatic organisms, wildlife and rare and endangered species in the San Francisco Bay. To attain water quality

[1] For the purpose of this document, control measures defined as pollution prevention practices, source controls and treatment controls that Permittees conduct or cause to be conducted.

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standards, the TMDLs set regulatory targets and a maximum total allowable pollutant load from all sources combined (i.e., TMDL). Loads reductions needed to obtain the TMDLs are assigned to sources through wasteload (point sources) and load (nonpoint sources) allocations. Urban stormwater runoff was identified as a pollutant source in both the PCBs and mercury TMDLs and was therefore assigned wasteload allocations accordingly.

On February 12, 2008, the federal Environmental Protection Agency approved a Basin Plan amendment incorporating a Total Maximum Daily Load (TMDL) for mercury in San Francisco Bay (Mercury TMDL) and an implementation plan to achieve the TMDL. The amendment was formerly adopted by the Regional Board, the State Water Resources Control Board, and the state Office of Administrative Law. Mercury TMDL targets include: 1) a Baywide suspended sediment mercury concentration of 0.2 mg mercury per kg dry sediment; 2) a large fish target of 0.2 mg mercury per kg fish tissue that applies striped bass; and, 3) a small fish target of 0.03 mg mercury per kg fish for protection of wildlife (i.e., piscivorous birds).

The U.S. Environmental Protection Agency approved a TMDL for PCBs in the San Francisco Bay on March 29, 2010. The Basin Plan amendment incorporating this TMDL and an implementation plan to achieve the TMDL was formerly adopted or approved by the Regional Board, the State Water Resources Control Board, and the state Office of Administrative Law. The PCBs TMDL includes one target, a fish tissue target of 10 ng of Total PCBs[2] per g of fish tissue (white croaker or shiner surfperch).

TMDL Wasteload Allocations

To reach the TMDL targets described above and obtain water quality standards in the Bay for mercury and PCBs, the pollutant reductions are required from each source causing or contributing to Bay impairment. For mercury, a 43% reduction of total mercury discharged to the Bay from all sources combined is required. The largest mercury reductions are required from the Guadalupe River (legacy mining), Central Valley watershed, and urban stormwater runoff. For PCBs, a 24 kg/yr (~70%) load reduction of total PCBs in discharges to the Bay is required from all sources combined to obtain water quality standards. The largest PCB load reductions are required from the Central Valley watershed and stormwater runoff.

The PCBs and mercury TMDL Staff Reports (Regional Board 2006, 2008) provide estimates of pollutants loads from urban stormwater runoff. Additionally, wasteload allocations (i.e., allowable annual discharges) for urban stormwater runoff are assigned by county to Bay Area stormwater programs. Stormwater programs identified in the TMDLs that represent Permittees to the Municipal Regional Stormwater NPDES Permit (see next section) include:

- Santa Clara Valley Urban Runoff Pollution Prevention Program
- Alameda Countywide Clean Water Program
- Contra Costa Clean Water Program
- San Mateo Countywide Water Pollution Prevention Program
- Fairfield-Suisun Urban Runoff Management Program
- City of Vallejo & Vallejo Sanitation and Flood Control District

[2] Based on the use the term "Total PCBs" in the PCBs TMDL, Total PCBs is defined as either: 1) sum of Aroclors; 2) sum of the individual congeners routinely quantified by the Regional Monitoring Program (RMP) for Water Quality in the San Francisco Estuary; or 3) sum of the National Oceanic and Atmospheric Administration (NOAA) 18 congeners converted to total Aroclors.

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Mercury and PCB TMDL loads, wasteload allocations (WLA), and load reductions assigned to these stormwater programs are included in Table 1-1. Pollutant load reductions represent the goal that stormwater programs should strive to attain through stormwater control measure implementation.

Table 1-1. Mercury and PCB loads, wasteload allocations and load reduction goals for Bay Area Phase I stormwater programs.

Entity	Mercury (kg/yr)			PCBs (kg/yr)		
	Load (2003)	Wasteload Allocation	Required Load Reduction[4]	Load (2003)	Wasteload Allocation	Required Load Reduction[4]
Santa Clara Valley Urban Runoff Pollution Prevention Program	44	23	**21**	5.5	0.5	**5.0**
Alameda County Clean Water Program	39	20	**19**	4.9	0.5	**4.4**
Contra Costa Clean Water Program	22	11	**11**	2.7	0.3	**2.4**
San Mateo County Water Pollution Prevention Program	16.4	8.4	**8**	2.1	0.2	**1.9**
City of Vallejo and VSFCD[1]	3.2	1.6	**1.6**	1.0[3]	0.1[3]	**0.9**[3]
Fairfield-Suisun Urban Runoff Management Program[2]	3.1	1.6	**1.5**			

[1]Vallejo Sanitation and Flood Control District
[2]Includes the City of Fairfield and Suisun City
[3]The PCB TMDL assigns a combined allocation to "Solano County", which only includes discharges from the cities of Vallejo, Fairfield, Suisun City
[4]Load reductions presented in the table were calculated for each stormwater program by subtracting the applicable WLA (originally based on relative populations) from the pollutant load (originally based on relative population).

Wasteload allocations (WLAs) for urban stormwater runoff programs presented in Table 1-1, implicitly include all current and future permitted discharges within the geographic boundaries of municipalities and unincorporated areas. Permitted discharges include those covered under municipal stormwater NPDES permits, and discharges attributable to the California Department of Transportation (Caltrans) roadways and non-roadway facilities and rights-of-way, atmospheric deposition onto the surface of the watershed, public facilities (e.g., schools), properties adjacent to stream banks, industrial facilities, and construction sites.

1.1.2 Municipal Regional Stormwater Permit Requirements

On December 1, 2009, the Municipal Regional Stormwater NPDES Permit (Order R2-2009-0074), also known as the Municipal Regional Permit (MRP), became effective. The MRP applies to all 76 large and medium municipalities (cities and counties) and flood control agencies in the San Francisco Bay Region. In provisions C.11 and C.12, the MRP requires Permittees to implement a series of control measures at full or pilot-scale that are intended to reduce mercury and PCBs in urban stormwater runoff . These control measures include:

- Collection and Recycling of Mercury-containing Devices (Mercury)
- Investigations and Abatement of Sources in Drainages (Mercury & PCBs)
- Evaluations of Enhanced Municipal Sediment Management Practices (Mercury & PCBs)
- Evaluations of On-Site Stormwater Treatment via Retrofits (Mercury & PCBs)

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- Diversions to Publicly Owned Treatment Works (Mercury & PCBs)
- Regional Risk Reduction Program Implementation (Mercury & PCBs)
- Identification of POCs During Industrial Inspections (PCBs)
- Evaluations of PCB-Containing Material Manage Practices during Building Demolition and Renovation (PCBs)

In addition to these, Permittees have historically and continue to implement control measures that provide additional reduction in pollutant loads. These control measures include:

- Street Sweeping;
- Stormwater Drainage System Maintenance (e.g., removal of material and sediments from catch basin, drop inlet and pump stations);
- Sediment Management in Channels and Water Bodies;
- New and Redevelopment Controls (e.g. low impact development);
- Public Outreach and Participation; and,
- Tracking and Participating in Regulatory Processes (e.g., bans and recycling requirements of pollutant-containing devices)

Provisions C.11.g and C.12.g require Permittees to develop and implement a monitoring program to quantify mercury and PCB loads reduced through the implementation of these (and other) control measures. Consistent with the TMDLs, load reductions and progress toward urban stormwater runoff WLAs may be demonstrated through one of three methods:

1. Quantify through estimates the average annual mercury load reduced by implementing pollution prevention, source control and treatment control efforts required by the provisions of this permit or other relevant efforts; or
2. Quantify the mercury load as a rolling five-year average using data on flow and water column mercury concentrations; or
3. Quantitatively demonstrate that the mercury concentration of suspended sediment that best represents sediment discharged with urban runoff is below the target of 0.2 mg mercury/kg dry sediment.

Permittees are moving forward on studies to demonstrate loads reduced and WLA progress using each of the methods described above. Water quality monitoring activities conducted through the *Regional Monitoring Program for Water Quality in the San Francisco Bay (RMP)* and the *Bay Area Stormwater Management Agencies (BASMAA) Regional Monitoring Coalition (RMC)* are currently attempting to estimate changes in pollutant loads (Method #2) and concentrations (Method #3). However, due to the diffuse nature of mercury and PCBs in the San Francisco Bay watershed, observable trends in loads and concentrations in creeks and rivers draining to the Bay could take decades. Quantification of loads reduced through pollution prevention, source controls and treatment controls (Method #1) is the focus of this memorandum.

1.2 Purpose and Scope

Methodologies presented in this document are intended to comply with Provisions C.11.g and C.12.g of the MRP. Additional purposes of the loads reduced quantification methods described in this memorandum include:

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- Providing MRP Permittees with methodologies to assess progress towards WLAs assigned to urban stormwater runoff in the PCBs and mercury TMDLs;
- Assessing the effectiveness of pollution prevention programs, source control activities and treatment controls currently implemented in the Bay Area; and,
- Developing concepts for developing baseline levels of control measure implementation and commensurate load reductions, which will allow "new or enhanced" load reduction to be quantified.

1.3 Memorandum Organization

This technical memorandum is organized into four sections: 1) Introduction, background and purpose; 2) Mercury and PCB uses, sources and loadings; 3) Loads quantification methods overview, key assumptions and guiding principles; 4) Factsheets for each control measure that include quantification methods, formulas, assumptions, and data inputs and tracking needs; and, 5) References for all citations.

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2.0 MERCURY AND PCB USES, SOURCES AND LOADINGS

2.1 Historical and Current Uses and Sources

2.1.1 Polychlorinated Biphenyls (PCBs)

Polychlorinated biphenyls are mixtures of up to 209 individual chlorinated compounds (known as congeners). PCBs were manufactured in the United States and used widely from the late 1920s through the 1970s. Due to their non-flammability, chemical stability, high boiling point and electrical insulating properties, PCBs were used in hundreds of industrial and commercial applications including electrical, heat transfer, and hydraulic equipment; as plasticizers in paints, plastics and rubber products; in pigments, dyes and carbonless copy paper and many other applications. Because of their persistent qualities, and physical and chemical characteristics, PCBs are found in environmental media worldwide, including air, sediment from street sweeping and stormwater conveyance systems, sediment and water from flood control channels and receiving waters, and urban stormwater runoff.

The U.S. total production of PCBs by Monsanto has been reported to be approximately 640,000 metric tones (de Voogt and Brinkman 1989). Production peaked in 1970 at approximately 30,000 tones or about 6% of the total U.S. production (Figure 2-1). Approximately 57% of total production occurred between 1960 and 1974 and 73% of the U.S. production occurred between 1955 and 1977. Overall, it appears that total production is proportional to total consumption in the U.S. (Breivik et al, 2002). However, although total consumption of PCBs in the U.S. (and Bay Area) continues to be at zero due to the ban in 1977, PCBs still remain in use in certain equipment and devices (e.g., transformers) and may possibly continue to contribute to urban stormwater runoff in the near future.

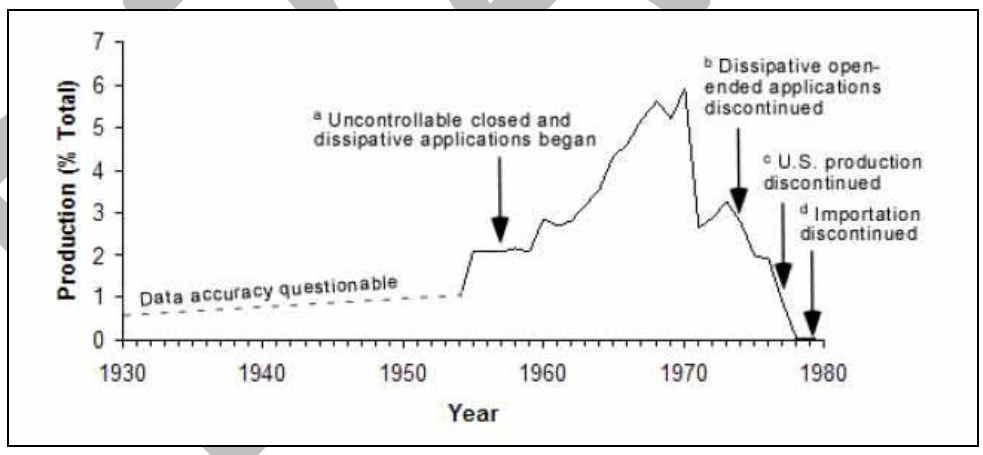

Figure 2-1. Annual production of PCBs in the U.S. from 1930 to 1970 (USEPA 1987).

2.1.2 Mercury

Mercury is a naturally occurring persistent, bioaccumulative metal that can be present in the elemental, inorganic or organic forms in the environment. Historically, mercury has been used in a variety of products. Primary among the over 3,000 historical industrial uses in the U.S. were battery manufacturing and chlorine-alkali production. Paints and industrial instruments have also been among the major uses. Mercury is also used in laboratories for making thermometers, barometers, diffusion pumps, and many other instruments, including mercury switches and other electrical apparatuses. Mercury is used as an

electrode in some types of electrolysis and in some types of batteries (mercury cells). Gaseous mercury is used in mercury-vapor lamps (e.g., fluorescent tubes) and advertising signs. Mercury is also the basis of dental amalgams and preparations, and can be a byproduct of burning fossil fuels and refining petroleum.

Mercury production and consumption in the U.S. have decreased dramatically since its use in gold production peaked in the mid/late 1800's (Figure 2-2). In the Bay Area, production was almost entirely from the mercury-rich New Almaden Mining District in Santa Clara County. Consumption of mercury in the U.S. has a similar trend as production. As illustrated in Figure 2-3, mercury consumption has also reduced substantially from 1970 to 2000 (Sznopek 2000), and the mass of mercury in the most current products and devices such as light bulbs and auto switches appear to also be decreasing (NEWMOA 2008). These decreases in mercury uses may assist MRP Permittees in reducing loads of mercury to the Bay.

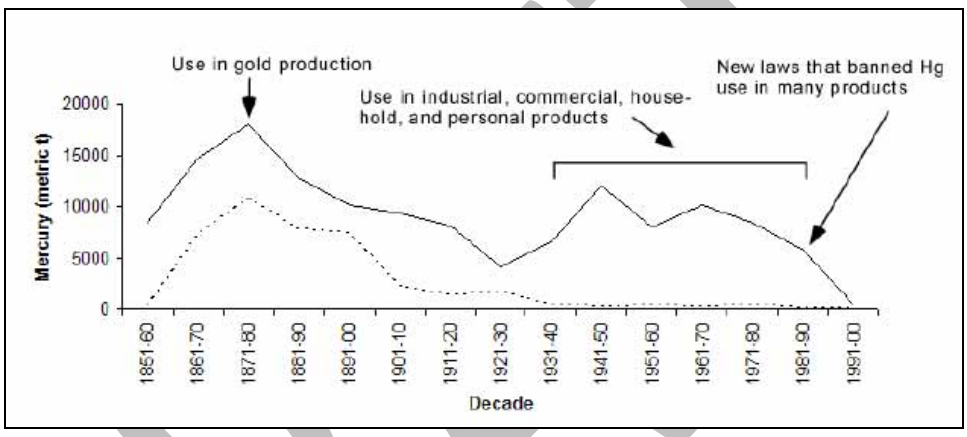

Figure 2-2. Mercury production in the U.S. (dark line) and New Almaden Mining District (dotted line) between 1850 and 2000.

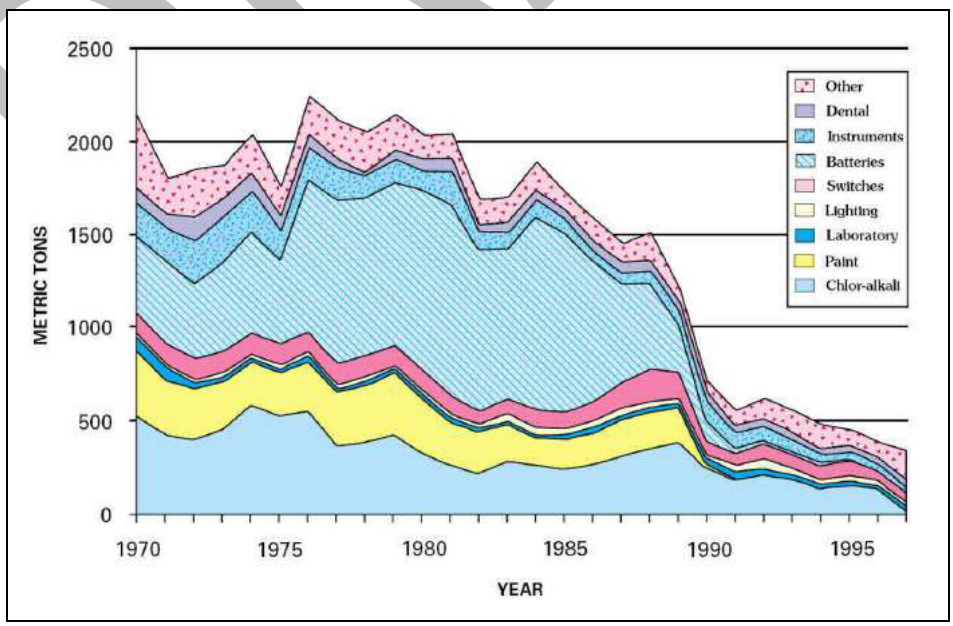

Figure 2-3. Mercury use in the U.S. between 1970 and 2000 (Sznopek 2000).

2.2 Contributions of Pollutant Mass to Stormwater from Sources

In collaboration with BASMAA member agencies, McKee et al. (2006) conducted a thorough literature review on sources and loads of mercury and PCBs entering urban stormwater and developed a mass balance (or conservation of mass) conceptual model based on this information. The intent of the model was to assist managers by providing a framework for identifying the most important mercury and PCBs uses and sources that likely impact Bay Area stormwater runoff. Although disparate information was used to develop the model, it provides the current best estimate of the mass of PCBs and mercury that is contributed to urban stormwater under a steady state scenario. The model also serves as context for management decisions, especially for mercury given its ongoing use (although reduced) in the urban environment and transport via atmospheric deposition. The following sections present the inventory of mercury and PCB sources to urban stormwater runoff based on the current understanding of PCB and mercury uses and linkages to stormwater.

2.2.1 PCBs

As illustrated in Figure 2-4, McKee et al. (2006) estimate that erosion from the surface of the urban watershed is the largest source of PCBs to Bay Area urban stormwater. Watershed surface erosion includes diffuse sources of sediment in urban areas associated with construction sites, vacant lots, unpaved foot paths, and wear debris from road and building surfaces, and represents the mass of PCBs associated with 50+ years of legacy accumulation on the surface of the watershed. Building demolition and remodeling, PCBs that continue to be in use in equipment and devices, and transformers and large capacitors represent the next largest sources. Smaller sources include atmospheric deposition and identified industrial contaminated areas.

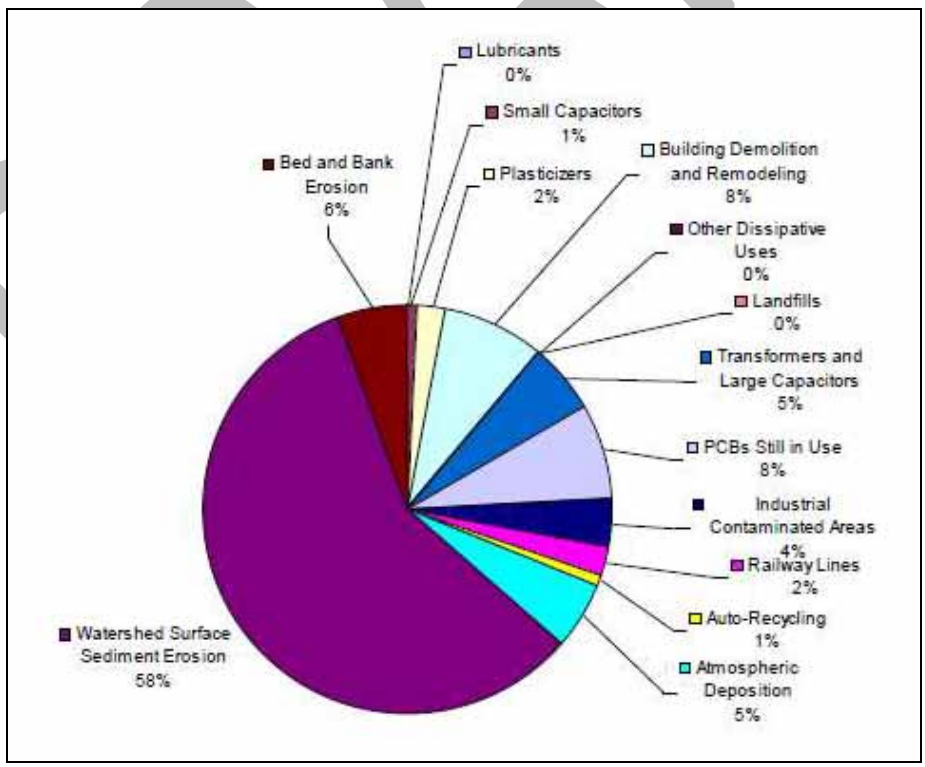

Figure 2-4. Comparison of relative mass inputs of PCBs to Bay Area urban stormwater runoff based on estimates from McKee et al. (2006).

2.2.2 Mercury

Similar to PCBs, McKee et al. (2006) estimate that erosion from the surface of the urban watershed is also the largest source of mercury to Bay Area urban stormwater (Figure 2-5). However, unlike PCBs, atmospheric deposition of mercury to the Bay watershed is estimated to provide a much larger proportion (27%) of the total load to urban stormwater. This suggests that mercury from atmospheric deposition may continue to play an important role in loadings of mercury to the Bay from stormwater. Accidental breakage during transport or disposal of instruments such as barometers, hydrometers, manometers, pyrometers, sphygmomannometers and thermometers, or switches and thermostats that contain relatively large masses of mercury is also suggested to be a large source of mercury to stormwater. Based on these estimates, fluorescent lamps and identified industrial sites with relatively elevated mercury concentrations are far less of a source to stormwater.

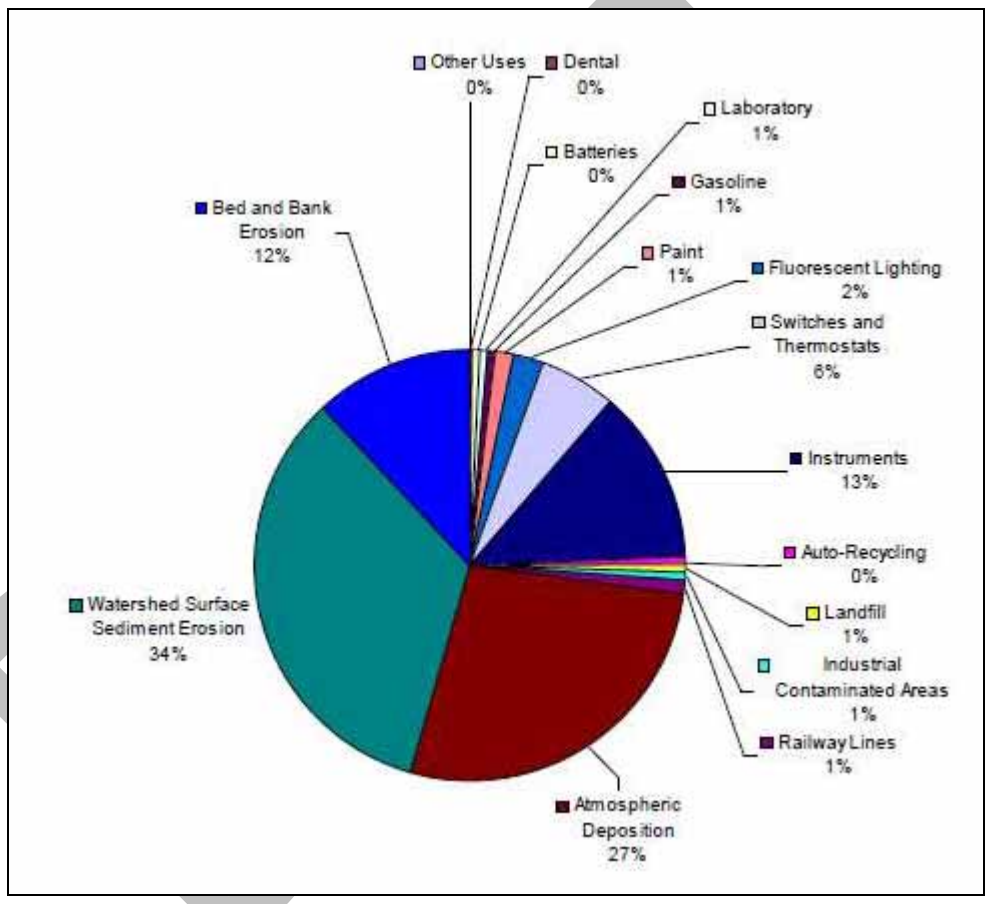

Figure 2-5. Comparison of relative mass inputs of mercury to Bay Area urban stormwater runoff based on estimates from McKee et al. (2006).

One property that distinguishes mercury from PCBs is the fact that mercury bioaccumulation occurs primarily after transformation to methylmercury (methylation). Recent scientific studies have identified monitoring tools to quantify the fraction of mercury most susceptible to methylation – the "reactive mercury" fraction of the total mercury measurement (Marvin-DiPasquale et al. 2009). Studies have also shown that mercury from atmospheric deposition is primarily reactive mercury (Butler 2007). This could mean that stormwater may contain a relatively larger fraction of reactive mercury compared to purely terrestrial sources. If so, water quality benefits could be attained in receiving waters by measures that

reduce the fraction of reactive mercury present in the total load. Although there is not sufficient monitoring data at present to make the case for loads reduced or avoided based on reducing the fraction of reactive mercury, that information may be developed over time and submitted to the Water Board for consideration.

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3.0 METHODS OVERVIEW, GUIDING PRINCIPLES AND KEY ASSUMPTIONS

This section provides an overview of key concepts, guiding principles and assumptions incorporated into quantitative methods presented in section 4.0 for determining mercury and PCB loads reduced due to control measure implementation. Quantitative methods for evaluating the effectiveness of urban runoff stormwater programs and control measures have been documented by CASQA (2007) and Strecker et al. (2001). These methods were reviewed and incorporated to the extent possible into loads reduced quantification methods presented in the next section. Additionally, information gained through previous evaluations of urban stormwater control measures for PCBs and mercury, sediment and water quality data collected in the Bay Area, and mercury and PCB use and source information described below were heavily utilized.

3.1 Literature Review

3.1.1 Evaluations of Urban Stormwater BMPs for PCBs and Mercury

The San Francisco Estuary Institute (SFEI) received a grant under the Proposition 13 Coastal Nonpoint Source Program to review and evaluate available existing literature on: 1) historical and current PCB and mercury uses, sources, and transport pathways to urban stormwater runoff; 2) PCB and mercury concentrations in stormwater, including considerations of sediment particle sizes; and, 3) current and potential implementation of best management practices (BMPs) used to reduce loadings of sediment-associated contaminants in urban stormwater. In a series of reports completed as part of the project, uses, sources and conceptual models of mercury and PCB in the urban environment and stormwater (McKee et al. 2006; Rothensberg et al. 2010); geographical distributions of mercury and PCBs in Bay Area sediments (Yee and McKee 2010); and realized and potential control measure effectiveness (Mangarella et al. 2008; SFEI 2010) were documented. Additionally, factors that affect the treatability of these pollutants and the efficacy of treatment devices in removing mercury and PCB from stormwater in the drainage network were summarized (Yee and McKee 2010; SFEI 2010). These studies provide the most complete picture on the effectiveness of pollution prevention, source and treatment control measures of control measures to reduce mercury and PCBs in urban stormwater runoff, and therefore associated results and conclusions were heavily relied upon in the development of quantification methods presented in this technical memorandum.

3.1.2 Pollutant Characterization Studies

As described above, geographical distributions in concentrations of mercury and PCBs in watershed sediments throughout the Bay area are summarized in Yee and McKee (2010). A portion of these data were collected by municipal stormwater programs through initial studies (EOA 2002, ACCWP 2002) and follow up case studies focused on PCBs (Citiations), and evaluated during the development of quantification methods. These data were most useful in developing average concentrations of PCBs and mercury in sediment within stormwater drainage systems (e.g., catch basins, drop inlets and pump stations), which were need to quantify average loads of these pollutants removed via drainage system maintenance (i.e., sediment removal).

3.1.3 Street Sweeping Studies

Throughout the past three decades, scientists and engineers have conducted numerous studies designed to assess the effectiveness and efficiencies of municipal street sweeping programs (EOA 2007). These studies have been previously summarized by EOA (2007) as part of a study designed to calculate

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pollutant loads removed via street sweeping in Contra Costa County, and Mangarella et al. (2008) as part of a desktop evaluation of control measure scenarios to reduced PCBs and mercury in bay Area stormwater. Lessons learned from these studies were incorporated into loads reduced calculations for street sweeping that are presented in section 4.0. Additional information on PCB and mercury concentrations in materials collected by street sweepers in the Bay Area, composition of the material, sediment particle sizes, and geographical distributions based on land uses and age-of-urbanization were also heavily utilized.

3.1.3 Additional Mercury and PCB Use and Source Information

Information on current and historical uses of mercury and PCBs was also obtained during the literature review. Specifically, to develop load reduction estimates for pollution prevention activities (e.g., recycling programs) the number and volume of devices, equipment and materials that contain mercury and PCBs, and the current and historical mass of these pollutants in each device was obtained. Information from reports on mercury flow analyses (Barr Engineering 2001), device recycling rates (ALMR 2003, DTSC 2008, USEPA 2009, CIWMB 2009), content (NEMA 2008, DTSC 2008) and emissions (Barr Engineering 2001, USEPA 2008) were utilized. Bay Area specific air emission and deposition rates of mercury were also obtained (Rothensberg 2010; Tsai and Hoieneke 2001) to assess load reductions due to improved deposition of mercury onto the Bay watershed.

3.2 Control Measures Evaluated

The following sections briefly describe the control measures initially identified by Permittees as those that should be considered for development of loads reduced methodologies. Based on the availability of information on baseline, current and anticipated implementation levels, pollutant concentrations associated with loads removed, and control measure effectiveness, Permittees may choose to develop quantification methods for additional control measures.

3.2.1 Pollution Prevention

Pollution prevention programs and activities are intended prevent pollutants that are present within materials, devices and equipment from entering the environment and contributing to stormwater pollution. Pollution prevention control measures specific to mercury and PCBs are those that reduce the quantities of these pollutants in products and equipment through voluntary or regulatory approaches (e.g., mercury thermometer recycling programs), prevent accidental release or spills into the environment (e.g., industrial facility inspections), or assist in the recycling of materials that contains these pollutants (e.g., fluorescent lamps, switches, thermostats and transformers). These controls are implemented either directly by Permittees and associated solid waste programs in the Bay Area, or by other regulatory programs in which Permittees actively support, advocate or assist in implementing. More specific descriptions of pollution prevention measures anticipated for implementation are included in section 4.0.

Loads reduced quantification methods for the following pollution prevention control measures are included in this document:

- Fluorescent Lamp Recycling (Mercury)
- Thermostat Recycling (Mercury)
- Reduction of Pollutants from Local Atmospheric Sources (Mercury)

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The effectiveness of these measures with respect to stormwater runoff is not easily evaluated given that it is difficult to determine to what extent such mercury and PCBs in these materials would enter urban stormwater compared to other disposal options (e.g., landfills, sanitary sewer system). Therefore, uncertainties remain in loads reduced estimates for pollution prevention measures. Additional control measures for which loads reduced quantification methods may be developed in the future include: stormwater inspections at industrial and commercial facilities (PCBs and mercury), thermometer and auto switch recycling (mercury) and building demolition and renovation waste management (PCBs).

3.2.2 Source (Institutional) Controls

There is no universally accepted definition of "source control" as it pertains to stormwater management. Some practitioners refer to source controls as "non-structural controls", and many times they are confused with pollution prevention measures described in the previous section. For the purpose of this document, source controls are defined as institutional non-treatment measures that remove pollutants directly from streets, contaminated properties, stormwater conveyance systems, channels or receiving waters once they have already entered the environment.

For decades, MS4s have implemented source controls that have directly or indirectly helped to improve water quality in the Bay Area. For example, street sweeping on roads and parking lots, although mainly targeted at removing trash and other road related debris, also removes pollutants like PCBs and mercury that strongly attach to particles. Source controls have also helped to establish (and limit) the baseline load condition depicted in the PCB and Mercury TMDLs through load and wasteload allocations. Loads reduced quantification methods for the following source (institutional) control measures are included in section 4.0:

- Street Sweeping (Mercury and PCBs)

Quantification methods will also likely be developed for stormwater conveyance system maintenance, sediment management in channels and water bodies, hydromodification controls and low impact development (LID). Methods for quantifying contaminated property remediation (mercury and PCBs) may also be developed as additional data on the effectiveness of this control measure is evaluated through pilot projects implemented as part of BASMAA's Clean Watersheds for a Clean Bay (CW4CB) project that is intended to comply with MRP requirements.

Because these actions physically remove pollutants from the environment, the process of quantifying the effectiveness of source controls is much more straight-forward and intuitive than pollution prevention activities. Additionally, as described in the previous section, scientist and engineers have conducted many studies aimed at quantifying the effectiveness of source controls. These studies provide numerous datasets and information to base loads reduced quantification tools described in this document.

3.3.3 Treatment Controls

Stormwater treatment controls are engineered devices or systems that can be installed or built in place to enhance the capture of pollutants. Treatment controls have a variety of modes of operation including those that slow down the movement of water, remove sediment and associated contaminants through filtering, settling, or otherwise separating sediment from flowing water, or adsorb and incorporate the substance into some kind of media (e.g. carbon, resin, or living plant material). For the purposes of this document, treatment controls include both those installed or built on-site or within a public right-of-

way, and diversions of stormwater (wet and dry weather) runoff to publically owned treatment works (POTWs).

A variety of treatment controls have been implemented throughout the Bay Area to control stormwater impacts on receiving waters (LFR 2004). The impetus for implementation of these controls, however, was not associated with concerns of PCBs or mercury and effectiveness monitoring was generally not conducted in a manner to yield load reduction estimates. Additionally, little to no data are available outside of the Bay Area on the effectiveness of treatment controls to reduce PCBs or mercury in urban runoff (McKee et al. 2006), other than scenarios described in Mangarella et al. (2008) that were based on their current understanding of demonstrated performance of various treatment controls for reductions of total suspended solids (Winer 2000, CASQA 2003, CalTrans 2004, ASCE and USEPA 2008, CalTrans 2010) and PCB and mercury settling studies (Yee and McKee 2010). Based on these sources, Figure 3-1 provides the estimated median BMP effluent concentrations of a number of stormwater treatment controls and is provided here primarily to represent the relative effectiveness of these controls types.

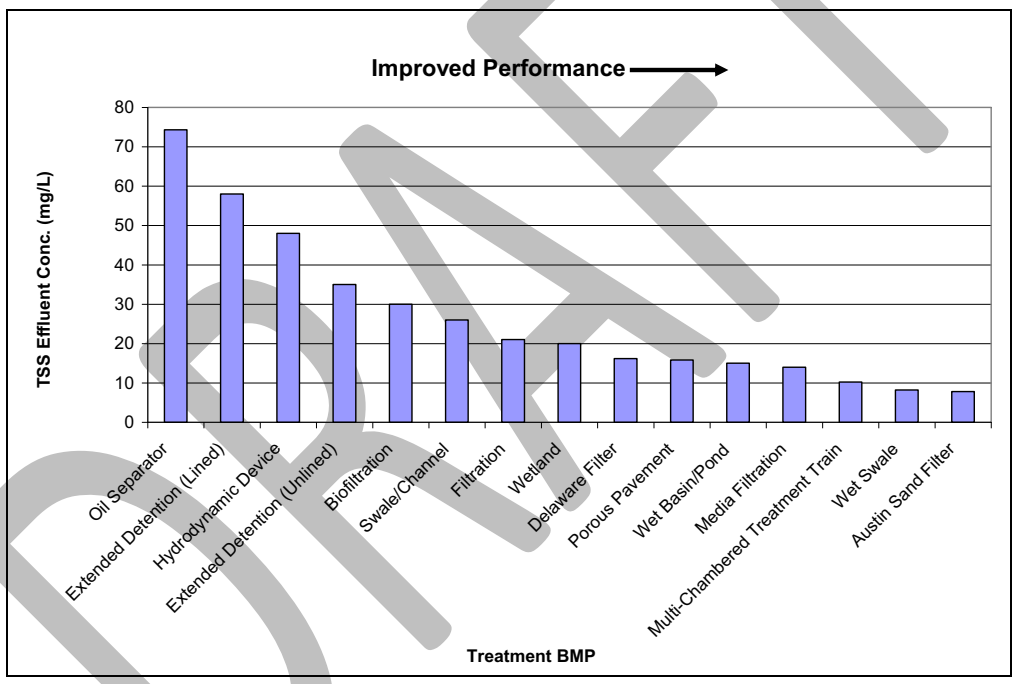

Figure 3-1. Estimated concentrations of total suspended solids (TSS) for various stormwater treatment controls (Mangarella et. al 2008).

Based on the limited data available on treatment controls with regard to their effectiveness in reducing PCB and mercury loads in urban stormwater runoff, quantitative methods for these control measures are not included in this technical memorandum at this time. That said, as described in section 1.1.2, Permittees will be implementing a variety of BMP effectiveness projects, treatment controls and diversions to POTWs at pilot-scales during the term of the MRP through the CW4CB project. Information collected on the effectiveness of these control will assist Permittees in developing load reduction quantification methods. As information becomes available, Permittees, stormwater programs or BASMAA may choose to update section 4.0 with fact sheets describing methods for quantifying the loads reduced via treatment controls.

3.4 Load Reduced Quantification Methods Overview

Quantification methods for assessing mercury and PCBs loads reduced that are presented in section 4.0 were based on a robust review of published and grey literature conducted through this and previous projects (see section 3.1). Quantification methods are intended to assist MRP Permittees in assessing loads of mercury and PCBs reduced through control measures that they have directly implemented (e.g., street sweeping, or assisted in causing the control measure to be implemented (e.g., changes in regulations). This section provides an overview of the guiding principles, key assumptions and concepts behind the methods presented in section 4.0. As quantification methods evolve through trial implementation, assumptions and concepts presented in this section should be adjusted accordingly.

3.4.1 Guiding Principles

Reductions in pollutant loads can be quantified in many ways. To provide transparency in the thought process behind the quantification methods presented in section 4.0, principles that guided the development of these methods are presented below.

- **Quantification methods are constrained by the extent of information available** – Only the information readily available on control measure effectiveness, degree of control measure implementation, concentrations and masses of pollutants in materials/devices/equipment, and baseline loads and loads reduced can be used to develop quantification methods and track annual load reductions. In some cases, information is very limited and assumptions therefore have to be made. Although these assumptions create uncertainties in load reduction calculations, if stated clearly and transparently, assumptions can be tested and revised accordingly as methods evolve.
- **Methods should be as simple and data inputs as tractable as possible** – As a general principle in creating the loads reduced formulas presented in section 4.0, the amount of information that Permittees are required to track as inputs to the formula was considered. In most cases, data that Permittees or stormwater programs will need to track and input into the loads reduced formulas consists of information they collect and submit to the Water Board as part of their Annual Reports. In limited cases, additional information included in reports submitted to State of California by other public agencies or private entities may need to be obtained to provide a complete picture of loads reduced from urban stormwater runoff during a specific year. Such cases are identified in the fact sheets.
- **Pollutant loads reduced targets serve as the goal to achieving WLAs** – The mercury and PCB TMDLs include both baseline loads (circa 2003) and wasteload allocations (WLAs) for urban stormwater runoff. The difference between the two is assumed to be the pollutant load that stormwater programs (and associated Permittees) need to reduce on an annual basis (see section 1.1.1) through control measure implementation. Realistically, however, the pollutant load discharged from urban stormwater runoff to the Bay fluctuates (possibly higher or lower) between years depending rainfall/runoff patterns, pollutant mobility, changes in sales and content of pollutant containing devices, and the degree of control measure implementation. Methods that can be used to estimate annual loads include mass-balances, empirical monitoring and simple or dynamic modeling. That said, given the inherent variability and uncertainties in quantifying urban runoff loads to the Bay on an annual basis, regardless of the method used , it is assumed for the purposes of assessing progress toward WLAs that the annual average loads of PCBs and mercury included in the TMDLs provides the baseline for which loads reduced will be measured, at least until new monitoring and modeling approaches developed through the

Regional Monitoring Program (RMP) Small Tributary Loading Strategy (STLS) yield updated loads information for PCBs and mercury.

- **Baseline levels of control measures implemented at the time loading estimates were developed (i.e., 2003) are implicitly incorporated into pollutant load estimates from urban runoff to the Bay** – Sediment and water quality data used to establish baseline loads in the TMDLs were collected circa 2003. As a simplifying assumption, control measures implemented (at associated pollutant loads reduced) at the time these data were collected are assumed to establish the baseline level of implementation for loads reduced by new or enhanced controls are compared. As described below, future enhancements of control measures implemented in 2003, or new control measures that target products/equipment/material that contain mercury or PCBs that are reasonably liable to enter urban stormwater will help further reduce PCB/mercury loads to the Bay and assist Permittees in addressing WLAs.
- **New and enhanced control measures implemented within the geographical boundaries of the Permittees may be quantified as loads reduced, regardless of the implementing entity** – As described in the PCB and Mercury TMDLs (Water Board 2006, 2008), WLAs for urban runoff implicitly include all current and future permitted discharges within the geographic boundaries of municipalities and unincorporated areas including, but not limited to, California Department of Transportation (Caltrans) roadways and non-roadway facilities and rights-of-way, atmospheric deposition, public facilities, properties proximate to stream banks, industrial facilities, and construction sites. Although implementation of control measures to reduce PCBs and mercury in many of the discharges listed above are outside of the direct jurisdiction of MRP Permittees, load reductions attributable to these control measures need to be accounted for in the context of WLAs assigned to stormwater programs. As such, quantification methods presented in section 4.0 (as well as future methods developed) include actions taken by public agencies and private entities that are assumed to directly affect loads of PCBs and mercury in urban stormwater runoff.

3.4.2 Key Assumptions

In addition to the guiding principles above, the key assumptions described below were included in load reduction quantification methods and results. Control measure specific assumptions are included in each fact sheet presented in section 4.0.

- **Control measures are assumed to be independent of each other** – In some cases, the implementation of one control measure could affect the effectiveness of another. For example, reducing mercury air emissions from local sources could affect pollutant accumulation on streets, which in turn could reduce the mass of pollutants available to source controls such as street sweeping. Evaluating the potential interaction of these controls quantitatively was beyond the level of analysis conducted herein, although potential interactions between control measures are identified and discussed in the fact sheets where appropriate.
- **Baseline conditions and control measure effectiveness are assumed to be geographically uniform**– Conditions vary among the various geographical areas that contribute runoff and pollutants to San Francisco Bay. Thus, projecting results obtained by studies conducted at specific locations may not be representative all areas. As a practical matter, however, we assumed that projections to the whole watershed, based on area, land use, or population, were adequate for the development of the proposed methods. As input data are collected to

populate formulas presented, considerations should be given to the spatial representativeness of these data and disaggregated or aggregated as needed.

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4.0 LOADS REDUCED QUANTIFICATION FACT SHEETS

This section includes a series of fact sheets that document preliminary loads reduced quantification methods. Fact sheets were developed for a limited number of pollution prevention and source controls, where a reasonable amount of information was obtained through the literature review to develop methods. As such, methods presented in these fact sheets are based on the most currently available information, and are intended to evolve as additional information becomes available. Much of the information reviewed was collected in the San Francisco Bay Area and therefore is applicable to Permittees. Other information used in quantification method development was collected as part of studies conducted in other areas of the U.S., but appear to be applicable to the Bay Area through scaling based on population.

Each fact sheet in this section includes: 1) a brief description pollutant source, 2) summaries of applicable control measures, 2) loads reduced formulas, 3) assumptions and data inputs, 4) future data tracking needs, and 5) references used to establish the methods. Fact sheets in this section include:

<u>Pollution Prevention</u>

- PP-1: Fluorescent Lamp Recycling (Mercury)
- PP-2: Thermostat Recycling (Mercury)
- PP-3: Reduction of Pollutants from Local Atmospheric Sources (Mercury)

<u>Source (Institutional) Controls</u>

- SC-1: Street Sweeping (Mercury and PCBs)

As this technical memorandum evolves through additional review and revisions, fact sheet for other control measures will be included. In particular, fact sheets for stormwater conveyance system maintenance, sediment management in channels and water bodies, hydromodification and low impact development (LID), stormwater treatment controls, and other controls may be developed to document methods.

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PP-1: Fluorescent Lamp Recycling (Mercury)

There are two main categories of lamps (i.e., light bulbs) currently used in large quantities in the United States (U.S.) - incandescent and luminescent gaseous discharge lamps (e.g., fluorescent and low-pressure sodium). Incandescent lamps do not contain mercury. Fluorescent lamps, however, contain mercury and are generally available in two types – tubular or compact. Tubular fluorescent lamps are mostly used in commercial or institutional buildings and usage is believed to have generally remained consistent over time. Compact fluorescent lamps (CFLs), however, are mostly used as energy-saving alternatives to incandescent lamps in homes and have their use has increased substantially in recent years (DTSC 2008).

Recycling of mercury in lamps is the primary control measure used to reduce mercury in the environment from this source. Technologies to reclaim mercury from spent lamps through recycling were developed in the U.S. starting in 1989. However, recycling did not drastically increase until the U.S. EPA announced the addition of lamps to the Universal Waste Rule (UWR) in 1999 (ALMR 2003). The State California's UWR became effective on February 8, 2002 and today prohibits the disposal of fluorescent lamps into landfills, regardless of the waste generator (household or business). The California Department of Toxic Substances Control (DTSC) has adopted regulations that require safe management and recycling of fluorescent lamps.

Applicable Control Measures

Methods describe in this fact sheets are applicable to the following urban stormwater runoff control measures, and as such may be used by Bay Area Permittees to assess progress towards WLA established in TMDLs:

- HHW Collection - Household fluorescent lamp recycling in the Bay Area is available at household hazardous waste (HHW) facilities, which are managed by cities, counties and special districts. A list of Bay Area household hazardous waste facilities that currently (2010) provide fluorescent lamp collection/recycling is attached. Information on the number and types of lamps recycled is available through the HHW facility or the California Integrated Waste Management board (CIWMB).
- Collection at Participating Businesses – Businesses throughout the Bay Area (e.g., IKEA, Home Depot and Orchard Supply) are beginning to accept spent fluorescent lamps from customers. Although tracking may be difficult, recycling provided by these businesses could be quantified by Permittees.
- Private Recycling Contractors - Recycling by small and large businesses occurs through private recycling contractors that coordinate directly with businesses that generate large and small quantities of lamps. The availability of information necessary to quantify loads reduced attributable to this control measure is currently unknown.

Loads Reduced Formula

Based on a review of available data and information gained through literature reviews, the following set equations will allow MRP Permittees to determine the mass of total mercury reduced from stormwater as a result of fluorescent lamps recycling conducted in a given year. Please note that the equations are unit-less and will need to be converted appropriately based on standard conversion rates (e.g., milligrams to kilograms).

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$$\mathbf{Reduction_{Lamps} = Current_{Lamps} - Base_{Lamps}}$$

where:

$Reduction_{Lamps}$	=	Mass of total mercury reduced from urban stormwater (above baseline), as a result of fluorescent lamp recycling in year of interest
$Baseline_{Lamps}$	=	Average annual mass of total mercury diverted from Bay Area stormwater during a baseline year(s) due to fluorescent lamp recycling
$Current_{lamps}$	=	Mass of total mercury diverted from Bay Area stormwater due to fluorescent lamp recycling in a year of interest

and;

$$\mathbf{Base_{Lamps}} = Lamps_{Base\#} \bullet Lamps_{BaseMass} \bullet Lamps_{Runoff}$$

$$\mathbf{Current_{Lamps}} = Lamps_{Current\#} \bullet Lamps_{CurrentMass} \bullet Lamps_{Runoff}$$

where:

$Lamps_{Base\#}$	=	Average annual number of fluorescent lamps recycled in baseline year(s)
$Lamps_{BaseMass}$	=	Average mass of total mercury in fluorescent and compact fluorescent lamps recycled in baseline year(s)
$Lamps_{Current\#}$	=	Number of fluorescent lamps recycled in a year of interest
$Lamps_{CurrentMass}$	=	Average mass of total mercury in fluorescent and compact fluorescent lamps recycled in a year of interest
$Lamps_{Runoff}$	=	% of total mercury mass in fluorescent lamps that contributes to the urban stormwater load of mercury to the Bay when the lamp is broken (see below)

and;

$$\mathbf{Lamps_{Runoff}} = Dep_{Lamps} \bullet Trans$$

where:

$Dep_{\mathbf{Lamps}}$	=	Average % of total mercury in fluorescent and compact fluorescent lamps that is deposited onto the surface of the watershed when the lamp is broken
Trans	=	Average % total mercury deposited onto the surface of the watershed when the lamp is broken that is transported by stormwater to the Bay

Assumptions and Data Inputs

Baseline Loads Reduced (2003)

- Baseline Level of Recycling ($Lamps_{Base\#}$) - The average annual number fluorescent lamps recycled from 2000 through 2003 provides the baseline number of lamp that were recycled prior to the TMDL baseline year of 2003. Estimated total number of fluorescent lamps recycled by in the U.S. businesses and households in 2003 are based on estimates by ALMR (2003). Estimates for the U.S. were normalized by population to the geographical area covered by the Municipal Regional Permit (MRP). Table 4-1 provides baseline (2003) recycling rates.

- Baseline Mercury in Lamps ($Lamps_{BaseMass}$) – The mass of mercury (kg) in lamps can vary based on the lamp type, size, manufacturer and date manufactured. Considerations are given to changes in the mass of mercury per bulb that has likely occurred between 2003 and the year of interest by including a baseline concentration ($Lamps_{BaseMass}$) and a concentration for the current year of evaluation ($Lamps_{CurrentMass}$). The mass of total mercury in lamps in 2003 are assumed to average 21 mg per lamp (US EPA 1998).

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Table 4-1. Estimated baseline (2000-2003) number of fluorescent lamps recycled in the jurisdictional boundaries of Bay Area MS4s.

Geographical Area/Entity	Households (20%)	Businesses (80%)	Total
United States	*2,680,000*	*150,080,000*	*152,760,000*
Alameda Countywide Clean Water Program	153,393	613,572	766,965
Contra Costa Clean Water Program	105,109	420,436	525,545
San Mateo County Water Pollution Prevention Program	73,226	292,902	366,128
Santa Clara Valley Urban Runoff Pollution Prevention Program	176,217	704,868	881,085
City of Vallejo and VSFCD[1]	12,460	49,841	62,301
Fairfield-Suisun Urban Runoff Management Program[2]	13,494	53,977	67,471

[1]Vallejo Sanitation and Flood Control District
[2]Includes the City of Fairfield and Suisun City

Current Loads Reduced (Year of Interest)

- Current Mercury in Lamps ($Lamps_{CurrentMass}$). The average mass of mercury in a lamp appears to have decreased post-2003 (baseline) due to the increase in CFL usage by households. Specifically, the National Electrical Manufacturers Association (NEMA) announced that under the voluntary commitment, effective April 15, 2007, participating manufacturers will cap the total mercury content in CFLs that are under 25 watts at 5 milligrams (mg) per unit, and CFLs that use 25 to 40 watts of electricity will have total mercury content capped at 6 mg per unit (NEMA 2009). Based on this substantial decrease in mercury mass in CFLs, each bulb recycled is assumed to have an average mass of 5.5 mg. New fluorescent tubes are also assumed to have 5.5 mg on average.
- Current Level of Recycling ($Lamps_{Current\#}$) – The number of fluorescent lamps recycled in the year of interest represents the current level of effort towards meeting WLAs assigned in the TMDL. Recycling efforts are managed by HHWs, participating stores, and private companies for small and large waste generators (US EPA 2009). Recycling efforts are expected to increase substantially over the next decade (US EPA 2009, DTSC 2008).

Baseline and Current Loads Reduced

- % Mercury from Broken Lamps that is Deposited on Watershed (Dep_{Lamps}) – The percentage of mercury in a broken lamp that is assumed to be deposited onto the surface of the watershed is based on a Barr Engineering (2001) study conducted in Minnesota and Wisconsin that focused on the fate of mercury from household products, combined with a partitioning analysis. The authors estimated 37% of the amount of mercury in lamps volatizes into the atmosphere, resulting from breakage, transfer and transit, as well as air emissions following disposal in landfills, combustion, and incineration. For the purposes of loads reduced calculations, we assume that 100% of the mercury that volatilizes into the atmosphere is deposited onto the surface of the watershed.
- % of Mercury Transport by Stormwater (Trans) – the average % imperviousness of Bay Area is an important factor because imperviousness is one of the key mechanisms for stormwater transport. Runoff coefficients are based on the % of imperviousness of a given land use. Based on the literature review conducted in support of this technical memorandum development, there remains a need for an average runoff coefficient for the "urban portion of the Bay" to

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complete this variable. As an initial percentage, we suggest using a 32% estimate based on modeling conducted as part of a Mercury Air Deposition Study by Tsai and Hoenicke (2001).

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PP-2: Thermostat Recycling (Mercury)

Thermostats are commonly used in most homes and commercial facilities to regulate room temperature. Older mechanical thermostats often contained elemental mercury in glass bulbs called ampoules. Through the mishandling of thermostats during demolition and waste transport, ampoules can break and mercury can be emitted to the surface of the watershed. Once in the watershed, mercury is available for transport to the Bay via urban stormwater runoff.

The sale of mercury thermostats was prohibited in California beginning on January 1, 2006 (SB 633). Based on this prohibition, the mass of mercury available to urban stormwater from thermostats is expected to decrease overtime. That said, there are roughly 19.8 million mercury thermostats currently in service in California (TRC 2009), suggesting that near-term contributions of mercury to urban stormwater runoff from thermostats may be important.

Applicable Control Measures

Loads reduced through the implementation of the following urban stormwater runoff control measures may be quantified and used by Bay Area MS4s to assess progress towards WLA established in TMDLs:

- HHW Thermostat Collection - Mercury thermostat recycling has been available through HHW facilities for a number of years and continues to be utilized by residents in the Bay Area.
- Recycling by Wholesalers/Retailers - California's *Mercury Thermostat Collection Act of 2008* (AB 2347) requires that by 2009 manufacturers establish a collection and recycling program for out-of-service mercury-added thermostats. The Thermostat Recycling Corporation (TRC) serves as the collection and recycling program for manufacturers in California (TRC 2010). The TRC provides collection containers to HVAC wholesalers, thermostat retailers, and HVAC contractors for a one-time charge. Collection containers are provided by the TRC to HHW facilities at no cost.
- Other Recycling Efforts – Although likely limited, other recycling activities conducted within the geographical boundaries of the MS4 may be quantified.

For the purposes of assessing progress towards urban stormwater runoff TMDL wasteload allocations, mercury thermostat recycling that occurs through any of these mechanisms described above may be included in loads reduced calculations.

Loads Reduced Formula

Based on a review of available data and information gained through literature reviews, the following set equations will allow MRP Permittees to determine the mass of total mercury reduced from stormwater as a result of thermostat recycling conducted in a given year. Please note that the equations are unit-less and will need to be converted appropriately based on standard conversion rates (e.g., milligrams to kilograms).

$$\mathbf{Reduction_{Therm} = Current_{Therm} - Base_{Therm}}$$

where:

$Reduction_{Therm}$	=	Mass of total mercury reduced from urban stormwater (above baseline), as a result of mercury thermostat recycling in year of interest
$Base_{Therm}$	=	Average annual baseline mass (kg) of total mercury diverted from Bay Area stormwater due to mercury thermostat recycling

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$Current_{Therm}$ = Mass of total mercury diverted from Bay Area stormwater due to mercury thermostat recycling in year of interest

and;

$$\mathbf{Base_{Therm}} = Therm_{Base\#} \bullet Therm_{BaseMass} \bullet Therm_{Runoff}$$

$$\mathbf{Current_{Therm}} = Therm_{Current\#} \bullet Therm_{CurrentMass} \bullet Therm_{Runoff}$$

where:

$Therm_{Base\#}$ = Average annual number of mercury thermostats recycled in baseline year(s)

$Therm_{BaseMass}$ = Average mass of total mercury in mercury thermostats recycled in baseline year(s)

$Therm_{Current\#}$ = Number of mercury thermostats recycled in year of interest

$Therm_{CurrentMass}$ = Average mass of total mercury in mercury thermostats recycled in year of interest

$Therm_{Runoff}$ = % of total mercury mass in mercury thermostat that contributes to the urban stormwater when a mercury thermostat is broken (see below)

and;

$$\mathbf{Therm_{Em}} = Dep_{Therm} \bullet Trans$$

where:

Dep_{Therm} = Average % of total mercury in thermostats that is deposited onto the surface of the watershed when the thermostat is broken

Trans = Average % total mercury deposited onto the surface of the watershed that is transported by stormwater

Assumptions and Data Inputs

Baseline Loads Reduced

- Baseline Level of Recycling ($Therm_{Base\#}$) – The average annual number of mercury thermostats recycled from 2000 through 2003 provides the baseline number of thermostats that were recycled prior to the TMDL baseline year (i.e., 2003). The annual average number of mercury thermostats that were recycled by U.S. businesses and households during this time is based on data from TRC (2008). Estimates for the U.S. were normalized by population to the geographical area covered by the Municipal Regional Permit (MRP). Table 1 provides baseline (2000-2003) recycling rates.

Table 4-2. Estimated baseline (2000-2003) number of thermostats recycled in the jurisdictional boundaries of Bay Area MS4s.

Geographical Area	# Recycled
United States	***67,891***
California	***3,420***
Alameda County Clean Water Program	341
Contra Costa Clean Water Program	234
San Mateo County Water Pollution Prevention Program	163
Santa Clara Valley Urban Runoff Pollution Prevention Program	392
City of Vallejo and VSFCD[1]	28
Fairfield-Suisun Urban Runoff Management Program[2]	30

[1]Vallejo Sanitation and Flood Control District
[2]Includes the City of Fairfield and Suisun City

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Current Loads Reduced (in Year of Interest)

- Current Level of Recycling ($Therm_{Current\#}$) **–** The number of thermostats recycled in the year of interest represents the current level of effort towards meeting WLAs assigned in the TMDL. Recycling efforts managed by a combination of the TRC, wholesalers and HHWs within areas covered under the MRP may be counted towards this effort.

Baseline and Current Loads Reduced

- Mercury in Thermostats ($Therm_{Base/CurrentMass}$) – the amount of mercury in a thermostat is determined by the number of ampoules. There are generally one or two ampoules per thermostat (average is 1.4) and each ampoule contains an average of 2.8 grams of mercury (TRC 2008). Therefore, each thermostat recycled is assumed to contain approximately 4.0 grams of mercury.

- % Mercury in Thermostats that is Deposited on Watershed (Dep_{Lamps}) – The percentage of mercury in a thermostat that when broken is assumed to be deposited onto the surface of the watershed is based on a Barr Engineering (2001) study conducted in Minnesota and Wisconsin that focused on the fate of mercury from household products, combined with a partitioning analysis. The authors estimated 37% of the amount of mercury in lamps volatizes into the atmosphere, resulting from breakage, transfer and transit, as well as air emissions following disposal in landfills, combustion, and incineration. For the purposes of loads reduced calculations, we assume that 100% of the mercury that volatilizes into the atmosphere is deposited onto the surface of the watershed.

- % of Mercury Transport by Stormwater (Trans) – the average % imperviousness of Bay Area is an important factor because imperviousness is one of the key mechanisms for stormwater transport. Runoff coefficients are based on the % of imperviousness of a given land use. Based on the literature review conducted in support of this technical memorandum development, there remains a need for an average runoff coefficient for the "urban portion of the Bay" to complete this variable. As an initial percentage, we suggest using a 32% estimate based on modeling conducted as part of a Mercury Air Deposition Study by Tsai and Hoenicke (2001).

References

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PP-3: Local Atmospheric Sources (Mercury)

Local (e.g., crematoria) and global (e.g., coal power plants in Asia) emissions of mercury can enter the Bay Area air basin and deposit directly onto the San Francisco Bay or on land surfaces within the local San Francisco Bay watershed. Mercury from air emissions may also be exported beyond the San Francisco Bay Area. The mass of mercury deposited onto the Bay is explicitly accounted for in the Mercury TMDL. Mercury deposited onto the surface of the watershed, however, is included in the urban stormwater load and associated wasteload allocation in the TMDL.

Based on an assessment of local air sources in the Bay Area conducted by the San Francisco Estuary Institute (SFEI) through a Proposition 13 grant, local air sources of mercury (e.g., crematoria and Portland cement plants) may be significant contributors of mercury found in urban stormwater runoff. The total estimated emissions of mercury from all air local sources within the San Francisco air basin are estimated at 214 kg/yr (CARB 2010). The emissions from the one Bay Area portland cement manufacturer (i.e., Lehigh Hanson Permanente Cement Plant) located in western Santa Clara County are estimated at 61 kg/yr (Rothenberg et al. 2010). Annual emissions from the approximately 40 crematoria in the nine county San Francisco Bay Area[3] have been estimated to range from a most probable value of 12 kg/yr to a worst case of 47 kg/yr (Lindquist and Bateman 2000). The primary source of the mercury in the crematoria emissions is assumed to be dental fillings.

Applicable Control Measures

Loads reduced through the implementation of the following control measures that directly affect mercury loads from urban stormwater runoff may be quantified and used by Bay Area MS4s to assess progress towards WLA established in the Mercury TMDL:

- New Emission Standards for Portland Cement Plants – The U.S. EPA has proposed *National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry* that is currently under review. BASMAA and SCVURPPP have provided comment letters to U.S. EPA regarding the proposed adoption regarding the potential nexus between emissions at the plant and mercury in urban stormwater runoff.
- Reduction in Mercury Emissions from Crematoria - Mercury has been widely used in the dental industry in amalgam fillings for teeth for decades. Substantial decreases in the use of mercury in dental amalgam due to increased consumer awareness of mercury use in fillings and the availability of more viable alternatives has been documented since 2003 (IMERC 2010). Continued reductions in the use of dental amalgam over time, may in turn reduce mercury emissions from crematoria/

Load Reduced Formula

Based on a review of available data and information gained through literature reviews, the following set equations will allow MRP Permittees to determine the mass of total mercury reduced from stormwater as a result of reductions in air emissions conducted in a given year. Please note that the equations are unit-less and will need to be converted appropriately based on standard conversion rates (e.g., milligrams to kilograms).

[3] Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, Solano and Sonoma

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$$\mathbf{Reduction_{AirEm} = Base_{AirEm} - Current_{AirEm}}$$

where:

$Reduction_{AirEm}$	=	Mass of total mercury reduced from urban stormwater baseline attributable to mercury air emission reductions in a year of interest
$Base_{AirEm}$	=	Average annual baseline mass of total mercury in Bay Area stormwater attributable to local mercury air emissions
$Current_{AirEm}$	=	Mass of total mercury in Bay Area stormwater attributable to local mercury air emissions during the year of interest

and;

$$\mathbf{Base_{AirEm}} = AirEm_{Base\#} \bullet AirEm_{BaseMass} \bullet Dep_{AirEm} \bullet Trans$$

$$\mathbf{Current_{AirEm}} = AirEm_{Current\#} \bullet AirEm_{CurrentMass} \bullet Dep_{AirEm} \bullet Trans$$

where:

$AirEm_{Base\#}$	=	Number of crematory or portand cement manufacturers in baseline year(s)
$AirEm_{BaseMass}$	=	Average annual mass of total mercury emitted from crematory or portand cement manufacturers in baseline year(s)
$AirEm_{Current\#}$	=	Number of crematory or portand cement manufacturers in year of interest
$AirEm_{CurrentMass}$	=	Mass of total mercury (kg) emitted from crematory or portand cement manufacturers in year of interest
Dep_{AirEm}	=	Average % of total mercury mass in emissions from crematory or portand cement manufacturers that is deposited onto the surface of the watershed
Trans	=	Average % of total mercury mass deposited onto the surface of the watershed that runs off into urban stormwater (based on runoff coefficients)

Assumptions and Data Inputs

Baseline Loads

- Baseline Number of Air Emission Facilities ($AirEm_{Base\#}$) – In 2003, there were 31 crematoria (see Table 4-3) and one portand cement manufacturer in the geographical area subject to the MRP.
- Mass of Mercury Emitted from Facilities during Baseline Years ($AirEm_{BaseMass}$) - Emission estimates for crematoria are based on dental statistics and the average amount of mercury used in amalgams. Annual emissions from the approximately 40 crematoria in the nine county San Francisco Bay Area are assumed to be 12 kg/yr (most probable number), or an average of 0.3 kg/yr of mercury per crematoria (Lindquist and Bateman 2000). Mercury emissions from the Lehigh Hanson Permanente Portland Cement Plant located are estimated at 61 kg/yr in 2009 (Rothenberg et al. 2010). For the purposes of establishing baseline, this mass of mercury in 2009 was assumed to also be emitted in 2003.

Current Loads (in Year of Interest)

- Number of Air Emission Facilities in Year of Interest ($AirEm_{Current\#}$) – Due to the closing of crematoria or portland cement manufacturing plants, the number of facilities emitting mercury in the Bay Area may change overtime. Tracking of these businesses should be conducted accordingly to insure the most up-to-date information is used in loads reduced calculations.
- Mass of Mercury Emitted from Facilities during Year of Interest ($AirEm_{CurrentMass}$) – Mercury in crematoria emission may change in the future due to the reduction in the number and size of mercury amalgam fillings used. If literature suggests that the number or size of mercury-based

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filling decreases, the estimated 0.3 kg/yr should be refined to account for this decrease. Likewise, if regulations go into place for portland cement manufacturers, the estimated mass of mercury emitted from this source should be revised. In the absence of new information or regulation, the baseline mass of mercury emitted from these facilities should be used to calculate the mass emitted during the year of interest.

Baseline and Current Loads Reduced

- % of Total Mercury in Emitted that is Deposited onto the Watershed (Dep_{AirEm}) – Based on our understanding of air deposition of contaminants, only a percentage of local mercury emissions are deposited onto the surface of Bay watershed. Predicting this percentage through field sampling or modeling, however, is extremely complex and results are typically highly variable and uncertain (USEPA 2001). Therefore, we provide a conservative assumption of 20% of the mercury emitted from these sources is deposited on the surface of the watershed in the Bay Area.
- % of Total Mercury Mass Deposited that Runs Off (Trans) – the average % imperviousness of Bay Area is an important factor because imperviousness is one of the key mechanisms for stormwater transport. Runoff coefficients are based on the % of imperviousness of a given land use. Based on the literature review conducted in support of this technical memorandum development, there remains a need for an average runoff coefficient for the "urban portion of the Bay" to complete this variable. As an initial percentage, we suggest using a 32% estimate based on modeling conducted as part of a Mercury Air Deposition Study by Tsai and Hoenicke (2001).

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Table 4-3. Crematories within the geographic boundaries of MRP Permittees in 2009 (CARB 2010).

CARB ID	County	Name	Address	City	Zip Code	2003	2008
2501	ALA	LIVERMORE CREMATORY	3833 EAST AVENUE	LIVERMORE	94550	X	x
3314	ALA	ROSELAWN CEMETERY	1240 N Livermore Ave	LIVERMORE	94550	X	x
3576	ALA	BAY AREA CREMATORY	1051 HARDER ROAD	HAYWARD	94542	X	x
3786	ALA	CHAPEL OF THE CHIMES	4499 Piedmont Ave	OAKLAND	94611	X	x
3809	ALA	MOUNTAIN VIEW CEMETERY ASSOCIA	5000 PIEDMONT AVE	OAKLAND	94611	X	x
4122	ALA	CEDAR LAWN MEMORIAL PARK & MOR	48800 WARM SPRING BLVD	FREMONT	94539	X	x
4134	ALA	IRVINGTON MEMORIAL CEMETERY	41001 Chapel Way	FREMONT	94538	X	x
4735	ALA	SENTINEL CREMATION SOCIETIES I	4080 Horton Street	EMERYVILLE	94608	X	x
5148	ALA	JESS C SPENCER MORTUARIES INC	21228 Redwood Road	CASTRO VALLEY	94546	X	x
6390	ALA	EVERGREEN CEMETERY	6450 Camden Street	OAKLAND	94605	X	x
8227	ALA	PACIFIC INTERMENT SERVICE	1094 Yerba Buena Ave	EMERYVILLE	94608	X	x
8399	ALA	CHAPEL OF THE CHIMES MEMORIAL	32992 Mission Blvd	HAYWARD	94544	X	x
10794	ALA	WFG-FULLER FUNERALS INC	4647 INTERNATIONAL BLVD	OAKLAND	94601	X	x
19321	ALA	ALAMEDA CREMATIONS	2900 MAIN ST, SUITE 1161	ALAMEDA	94501		x
9712	ALA	DIRECT FUNERAL SERVICES	2900 Main St, Suite 1161	ALAMEDA	94501	X	
2320	CC	OAK VIEW MEMORIAL PARK	2500 E 18th Street	ANTIOCH	94509	X	x
2634	CC	OAKMONT MEMORIAL PARK	2099 RELIEZ VALLEY RD	LAFAYETTE	94549	X	x
7394	CC	SUNSET VIEW CEMETERY ASSOCIATI	101 Colusa Avenue	EL CERRITO	94530	X	x
7564	CC	ROLLING HILLS MEMORIAL PARK	4100 Hilltop Drive	RICHMOND	94803	X	x
11155	CC	HULL'S WALNUT CREEK CHAPEL	1139 Saranap Avenue	WALNUT CREEK	94595	X	x
1426	SCL	GAVILAN HILLS CREMATORY	910 1ST STREET	GILROY	95020	X	x
4205	SCL	OAK HILL MEMORIAL PARK & MORTU	300 Curtner Avenue	SAN JOSE	95125	X	x
11268	SCL	ALTA MESA IMPROVEMENT COMPANY	695 ARASTRADERO ROAD	PALO ALTO	94306	X	x
11459	SCL	VCA JOHNSON ANIMAL HOSPITAL	524 N Santa Cruz Ave	LOS GATOS	95030	X	x
12958	SCL	LOS GATOS MEMORIAL PARK	2255 Los Gatos Almadn Rd	SAN JOSE	95124	X	x
19204	SCL	WYANT & SMITH CREMATORY	174 N SUNNYVALE AVE	SUNNYVALE	94086		x
12867	SCL	WYANT & SMITH FUNERAL HOME	174 N SUNNYVALE AVE	SUNNYVALE	94086	X	
1299	SM	SKYLAWN MEMORIAL PARK	10600 Skyline Blvd	SAN MATEO	94402	X	x
2932	SM	CYPRESS LAWN CEMETERY ASSOCIAT	El Camino Real	COLMA	94014	X	x
5638	SM	OLIVET MEMORIAL PARK	1601 HILLSIDE BLVD	COLMA	94014	X	x
8020	SM	WOODLAWN CEMETERY	1000 El Camino Real	COLMA	94014	X	x
5791	SOL	FAIRMONT MEMORIAL PARK	1901 Union Avenue	FAIRFIELD	94533	X	x
12163	SOL	TWIN CHAPELS MORTUARY	1100 Tennessee St	VALLEJO	94590	X	x

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SC-1: STREET SWEEPING (MERCURY AND PCBS)

Street sweeping is conducted by most, if not all, Bay Area municipalities. The traditional purpose of street sweeping is to remove trash and debris that collect in the gutters at the edge of streets. However, street sweeping also removes sediment and associated pollutants such as mercury and PCBs that would otherwise be transported to the Bay via urban stormwater runoff. Although many studies[4] have attempted to assess the effectiveness of street sweeping activities, there continues to be disagreement among stormwater practitioners as to whether sweeping efficiency equates to improvements in the quality of stormwater runoff. Pollutant removal effectiveness of street sweeping may be directly affected by sweeper type, operation (i.e., speed), frequency and inabilities to sweep near curbs due to parked vehicles. Additionally, land uses and proximities to pollutant sources and hot spots may influence the concentration and mass of pollutants removed. These factors make developing pollutant reduction estimates for street sweeping challenging at best. As a practical matter, however, it is difficult to argue from a qualitative perspective that much if not all the material picked up by a sweeper would have otherwise been mobilized and transported by stormwater runoff.

Applicable Control Measures

Pollutant loads reduced through the implementation of the following urban stormwater runoff control measures may be quantified and used by Bay Area MS4s to assess progress towards WLA established in the PCB and Mercury TMDLs:

- Increases in the Pollutants Collected via Standard of Street Sweeping– Permittees may increase the volume of pollutants collected via modification to their existing street sweeping program. Modifications may include: 1) increasing the frequency of street sweeping; 2) enforcing parking violations on street sweeping days; or 3) purchasing new more efficient sweepers.
- Targeted Street Sweeping in Areas with Elevated Pollutants – Based on previous source studies conducted by Permittees, stormwater programs and SFEI, PCB (and to some extent mercury) concentrations are heterogeneous in the Bay watershed. In compliance with the MRP, pilot studies are currently being developed to test control measures (i.e., source investigations, stormwater treatment retrofits, and diversions to POTWs) in selected areas. These areas may also serve as locations where Permittees may chose to target enhanced street sweeping in the future.

Loads Reduced Formula

Based on a review of available data and information gained through literature reviews, the following set equations will allow MRP Permittees to determine the mass of total mercury and PCBs reduced from stormwater as a result of street sweeping conducted in a given year. Please note that the equations are unit-less and will need to be converted appropriately based on standard conversion rates (e.g., milligrams to kilograms).

[4] See citations in the references section and EOA 2007 for a summary of street sweeping studies.

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$$\mathbf{Reduction_{Streets} = Current_{Streets} - Baseline_{Streets}}$$

where:

$Reduction_{Streets}$	=	Mass of total mercury or PCBs reduced from urban stormwater (above baseline), as a result of street sweeping in year of interest
$Base_{Streets}$	=	Average annual mass of total mercury or PCBs diverted from Bay Area stormwater due to street sweeping in baseline year(s)
$Current_{Streets}$	=	Mass of total mercury or PCBs diverted from Bay Area stormwater due to street sweeping in year of interest

and;

$$\mathbf{Base_{Streets}} = Streets_{BaseMass} \bullet Streets_{\%Sed} \bullet Streets_{BaseVol} \bullet F$$

$$\mathbf{Current_{Lamps}} = Streets_{CurrentMass} \bullet Streets_{\%Sed} \bullet Streets_{CurVol} \bullet F$$

where:

$Streets_{BaseMass}$	=	Average (or measured) concentration of mercury or PCBs in street sweeping sediments collected in baseline year(s)
$Streets_{BaseVol}$	=	Average volume of street sweeping material collected in baseline year(s)
$Streets_{CurrentMass}$	=	Average (or measured) concentration of mercury or PCBs in street sweeping materials collected in year of interest
$Streets_{CurrentVol}$	=	Volume of street sweeping material collected in year of interest
$Streets_{\%Sed}$	=	% of "sediment" (by volume) in street sweeping material that has constituent PCBs or mercury attached
F	=	Factor for converting street sweeping sediment volume to dry mass

Assumptions and Data Inputs

Baseline Loads Reduced (2003)

- Concentration of Mercury/PCBs in Street Sweeping Sediment in Baseline Years ($Streets_{BaseMass}$) – "Average" concentrations (also called typical concentration values) of PCBs and mercury in street sweeping sediments have been developed through a combination of studies in Contra Costa (EOA 2007), Alameda (Salop and Akashah 2004) and Solano (EOA 2006) counties. Through these studies, pollutant concentrations were compared to sweeper type, land use and age-of-urbanization to determine if significant relationships exist. Based on the results, concentrations of PCBs in street sweeping sediments appear to be dependent upon the very coarse age-of-urbanization categories assigned to cities in Contra Costa and Alameda Counties where street sweeping characterization occurred (Figure 4-1- To be completed). Bay Area age-of-development categories include:
    - Early 20th Century – Represents the earliest and most extensive degree of urbanization/industrialization. May include municipalities where shipping and railways were used extensively for transporting industrial materials. Example cities include Richmond, Hayward, Oakland and Martinez.
    - Mid-Century – Represents the intermediate range in both time and degree of urbanization/industrialization. Example cities include Pinole, Concord, Orinda and Walnut Creek.
    - Late 20th Century – Represents the geographical area with the most recent urbanization. Includes areas where heavy industry never or minimally existed. Example cities include San Ramon, Livermore, Dublin, Brentwood and Clayton.

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Other factors appeared to have little to no effect on pollutant concentrations or the particle sizes of sediment collected (EOA 2007). Based on these results, high (75th percentile), average (mean), and low (25th percentile) PCB and mercury concentrations for the three age-of-urbanization categories were developed for use in loads reduced estimates (Table 4-4). To apply these concentrations, Permittees should determine which age-of-urbanization category best fits their municipality based on development patterns and degree of industrialization. Permittees may also choose to use default concentrations of total PCBs (0.094 mg/kg) or mercury (0.14 mg/kg), dry weight, or develop their own average concentrations based on methods similar to those used in Bay Area studies.

Table 4-4. Average (mean), low (25th percentile) and high (75h percentile) estimates for PCBs and mercury in street sweeping material collected by MRP Permittees.

Constituent (mg/kg)	Municipality's Age-of-Urbanization								
	Early 20th Century			Mid-Century			Late 20th Century		
	Low	Ave	High	Low	Ave	High	Low	Ave	High
Total PCBs	0.10	**0.18**	0.22	0.01	**0.03**	0.44	0.01	**0.03**	0.44
Total Mercury	0.17	**0.25**	0.32	0.05	**0.11**	0.14	0.03	**0.05**	0.07

- Average Volume of Street Sweeping Material Collected in Baseline Years ($Streets_{BaseVol}$) - The average volume of street sweeping material collected by Permittees has been reported annually to the Water Board via annual compliance reports for over a decade. Volumes are typically visually estimated by municipal maintenance staff and can be variable from year to year. For each Permittee, the volume of street sweeping material collected from 2000 to 2003 will be used as baseline for the purposes of calculating loads reduced.

Current Loads Reduced (Year of Interest)

- Average (or measured) Concentration of Mercury or PCBs in Street Sweeping Materials Collected in Year of Interest ($Streets_{CurrentMass}$) – Average concentrations of PCBs and mercury in street sweeping sediments based on recent studies are presented in Table 1. These concentrations (or default) concentrations should be used by Permittee as "current" concentrations unless new information is collected. Additionally, average concentrations may be replaced with site specific data collected through field studies.
- Volume of Street Sweeping Material Collected in Year of Interest ($Streets_{CurrentVol}$) - The volume of street sweeping material collected by Permittees should continue to be tracked and reported on an annual basis. To maintain comparability with baseline volumes, volumes should continue to be estimated in a similar manner as in previous years (visually).

Baseline and Current Loads Reduced

- % of Street Sweeping Material that has PCBs or Mercury Attached ($Streets_{\%Sed}$) – It is generally believed that sediment-associated pollutants adsorb to smaller sediment grain sizes due to the increased surface area available. However, it is currently unknown what

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grain size fractions in street sweeping material constitute the largest percentage of pollutants. This issue continues to be studied and information gained through future investigation will assist in defining the proportion of street sweeping material which is heavily associated with sediment-associated pollutants. For the purposes of developing loads reduced calculations, information gained through EOA (2007) and Salop and Akashah (2004) were utilized to establish that on average 60% of street sweeping material collected is < 2mm and therefore represents a large portion of the pollutant mass in street sweeping material (CH2MHill 1982, Bannerman 1983, Brinkman 1999, Walker and Wong 1999). (Please note that sweeper technology has also advanced considerably over the past 20 years with the emphasis on designing sweepers to remove fine sediments and associated pollutants, if Permittees acquire sweepers that are believed to be significantly more effective at removing fine sediments, this 60% factor presented here should be reconsidered).

- Factor for Converting Street Sweeping Sediment Volume to Dry Mass (F) – The material collected during street sweeping is typically reported in volumes (cubic yards). However, to calculate pollutant loads reduced, a volume to mass conversion factor must be applied. FEECO International developed volume to mass conversion factors for a variety of waste materials in support of the California Integrated Waste Management Act of 1989. These factors continue to be utilized by the California Integrated Waste Management Board (CIWMB 2003). Although the conversion factors may not be representative of every material collected by every Permittee, they are the best currently available. The volume to mass conversion factor is 918.4 kg per cubic yard (CY) of material collected.

References

Bannerman, R., K. Bohn and M. Bohn, (1983). Evaluation of Urban Non-Point Source Pollution Management in Milwaukee County Wisconsin, Volume I. Urban Storm Water Characteristics, Sources, and Pollutant Management by Street Sweeping. Prepared for the U.S. Environmental Protection Agency, Chicago, IL.

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CH2M Hill, (1982). Washoe County Urban Storm Water Management Program. Volume II. Street Particulate Data Collection and Analysis. Prepared for Washoe Council of Governments.

CIWMB (2003). Conversion factors for waste diversion estimates. http://www.calrecycle.ca.gov.

EOA (2006). Estimation of Pollutant Removal through Street Sweeping Activities in the City of Fairfield and Suisun City. Prepared by EOA, Inc. May 31.

EOA (2007). Pollutant Load Removal From Street Sweeping Best Management Practices - *Development of Typical Concentration Values for Pollutants of Concern in Contra Costa County, CA.* Prepared by EOA, Inc. March 31.

Salop, P and Akashah, M. 2004. A Review of Source Control Options for Selected Particulate-Associated TMDL Pollutants, Prepared for Alameda Countywide Clean Water Program. March.

Walker, T. and Wong, T. 1999. Effectiveness of Street Sweeping For Stormwater Pollution Control. Cooperative Research Centre for Catchment Hydrology. December.

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5.0 REFERENCES – TO BE COMPLETED

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A6

RMP Special Study Proposal: Synthesis of Information on Mercury
Estimated Cost: $75,000
Oversight Group: TRC, CFWG
Proposed by: Jay Davis, SFEI

PROPOSED DELIVERABLES AND TIME LINE

Deliverable	Due Date
Draft outline	December 2010
Draft report	May 2011
Final report	August 2011

BACKGROUND AND JUSTIFICATION

The RMP Mercury Strategy has funded a significant body of work to address the first two questions in the Strategy (listed below). This included three years of intensive monitoring of spatial and temporal patterns in mercury in small fish (a total budget of $450,000), a two-year study of mercury isotopes ($115,000), and a two-year study of passive samplers for aqueous methylmercury – "DGTs" – ($80,000). The results of these studies are either just being evaluated now (isotopes and DGTs) or will be available in December 2010 (the three-year dataset on small fish). In addition, extensive monitoring of other indicators of spatial patterns, temporal trends, fate, and effects have been conducted by RMP and other programs and projects in the last few years. Our state of knowledge has been advancing rapidly.

The RMP Mercury Strategy has articulated management questions to guide a long-term program of studies to support the goal of identifying and reducing high leverage pathways and thereby reducing mercury impairment in the Bay. The studies conducted to date are providing partial answers to some of the questions in the Strategy, but it is clear that we have not yet answered all of them. The optimal next steps to take in answering the questions, however, are unclear. A prudent next step to ensure effective use of RMP funds would be to thoroughly evaluate and synthesize all of the information acquired in the last several years and to use this synthesis as the basis for a plan for the next few years of mercury studies.

The complex biogeochemistry and spatial and temporal dynamics of mercury and especially methylmercury pose a challenge for such a synthesis effort. A large body of information on the various aspects of mercury science has been generated in the Estuary in the past few years. An interdisciplinary approach to the synthesis is called for, with the collaboration of a team spanning the different branches of mercury science. It will be important to include tidal wetlands within the scope of the review, given their potential influence on regional patterns of contamination in the Bay and the potential importance as a zone of methylmercury impact.

APPLICABLE RMP MANAGEMENT QUESTIONS

The most relevant questions for this synthesis are the questions articulated specifically for the Mercury Strategy.

1. Where is mercury entering the food web?
2. Which processes, sources, and pathways contribute disproportionately to food web accumulation?
3. What are the best opportunities for management intervention for the most important pollutant sources, pathways, and processes?
4. What are the effects of management actions?
5. Will total mercury reductions result in reduced food web accumulation?

OBJECTIVES AND APPROACH

The goal of the synthesis effort will be to produce a technical report that answers, to the extent possible, the Mercury Strategy questions based on the information that has accumulated to date. Other questions may also be addressed. Stakeholder input on an outline of the report will be obtained as a first step in the project.

A considerable body of information generated by the RMP and other programs has accumulated in recent years. Some of the datasets to be covered in the review are listed below.

- Status and Trends: RMP (Sport fish, Avian eggs, Sediment, Water), USGS Clapper rail feathers
- RMP Mercury Strategy: Small fish, Isotopes, DGTs
- Effects:RMP/CALFED Avian egg work, USFWS Rail work, Effects on fish
- Fate: RMP (cores, methylmercury budget)
- Loading Studies: Central Valley loads (RMP, Region 5), Small tributaries (loading studies, BMP study), atmospheric deposition (global, local), POTWs (Region 2, WERF, Sacramento regional)
- Wetlands: SBSP, Petaluma, Hamilton, Suisun Marsh, Crissy Field, Twitchell Island

Stakeholder suggestions on additional datasets to include will also be encouraged.

The synthesis will also evaluate progress relative to the Conceptual Model of Mercury in San Francisco Bay developed by Tetra Tech (2006) for the Clean Estuary Partnership.

The findings of this synthesis will be incorporated into an article to be published as in a special issue of a journal featuring synthesis papers for seven major ocean regions as part of the Coastal and Marine Mercury Ecosystem Research Collaborative (C-Merc), sponsored by the Dartmouth College Toxic Metals Superfund Research Program. C-Merc has convened a team of scientists and stakeholders to work together over a two-year period to gather and analyze data and publish a series of papers related to the inputs, cycling, and uptake of mercury in marine ecosystems. The other ocean regions to be covered include the Mediterranean, the tropics, the open ocean, the Gulf of Mexico, the

Gulf of Maine, and the arctic. Other papers on global mercury topics (e.g., mercury isotopes, climate change, health effects) will also be included in the special issue. The RMP effort will benefit from the synergy that comes from sharing and comparing data from San Francisco Bay with data from other parts of the world. The use of RMP funds will be strictly limited to answering the management questions identified by RMP stakeholders. Any work for C-Merc beyond that scope will be funded by SFEI. C-Merc will pay for travel to participate in workshops with other C-Merc authors.

LITERATURE CITED

Tetra Tech. 2006. Conceptual Model of Mercury in San Francisco Bay. Prepared for the Clean Estuary Partnership.

BUDGET

The estimated budget for this task is $75,000, all for SFEI labor. The hours allocated for each staff person are indicated below.

	Hours
Jay Davis	120
Don Yee	120
Ben Greenfield	120
Letitia Grenier	120
Lester McKee	80
Josh Collins	40

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Pollutants of Concern

STORMWATER INSPECTORS' GUIDANCE MANUAL

■ Purpose

The purpose of this manual is to provide guidance to municipal stormwater inspectors on inspecting industrial/commercial facilities for three pollutants of concern, i.e., copper, mercury and Polychlorinated Biphenyls (PCBs)

Organization of Guidance Manual

This manual is organized into five sections:

1. Regulatory Background – This section provides information on the regulations and permits that require agencies to inspect industrial/commercial facilities for the three pollutants of concern (POCs)
2. POC Matrix – This section identifies facilities and potential sources of copper, mercury and PCBs.
3. POC: Copper– This section, identifies facilities and potential copper sources, and identifies BMPs that should be implemented at the facilities. The focus of this section is to meet MRP requirements for copper control BMPs at industrial facilities.
4. POC: Mercury – The focus of this section is to identify products that contain mercury that may be found at industrial and commercial facilities and identify proper disposal/recycling and spill cleanup BMPs.
5. POC: PCBs – This section provides information on PCB regulations, PCB containing equipment, BMPs that should be implemented and guidance on referring facilities to regulatory agencies as appropriate.

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PCBs IN CAULK PROJECT
REVISED WORKPLAN

TAKING ACTION FOR CLEAN WATER:
BAY AREA TMDL IMPLEMENTATION

Agreement #09-305-550
between the State Water Resources Control Board
and the Association of Bay Area Governments
(ARRA restart of original Prop 50 grant agreement #09-305-550)

Revision prepared by San Francisco Estuary Partnership, December 2009

Original workplan submitted and approved July 2007

PCBs IN CAULK PROJECT
REVISED WORKPLAN

INTRODUCTION

This workplan describes revisions to activities for the PCBs in Caulk project, which is one part of the San Francisco Estuary Partnership (SFEP)'s grant-funded Taking Action for Clean Water project (Bay Area TMDL Implementation). The original workplan was submitted in July 2007. The revisions to this workplan are based on delays incurred by the state bond freeze and significant progress on the issue of PCBs in caulk since the original workplan submission. The original workplan is included at the end of this document for reference.

The Taking Action for Clean Water project undertakes water quality improvement actions to protect California coastal waters and to implement San Francisco Bay Area TMDLs for sediment, urban pesticides, and polychlorinated biphenyls (PCBs). Taking Action for Clean Water was originally funded by the Proposition 50 Coastal Nonpoint Source Pollution Control Program, and the project commenced in April 2007. California's bond freeze put the project on hold in December 2008. Funding to restart this project has been provided by the American Recovery and Reinvestment Act of 2009 and the Clean Water State Revolving Fund, through an agreement with the State Water Resources Control Board. The PCBs in Caulk Project works to improve management of PCBs that remain in Bay Area structures to prevent release into urban runoff.

The project was originally called the Structural PCBs project. We have changed the name to PCBs in Caulk project for clarity.

BACKGROUND

Elevated PCB levels threaten the health of people and wildlife consuming fish from San Francisco Bay. A TMDL to address PCB impairment of all segments of San Francisco Bay has been adopted by the San Francisco Bay Regional Water Quality Control Board. The San Francisco Bay PCBs TMDL Project Report found that urban runoff was one of the major sources of PCBs loads to the Bay and concluded that controlling PCBs sources in urban runoff was one of two top priorities for TMDL implementation.[1]

Based on this conclusion, the Clean Estuary Partnership (CEP) evaluated available data on sources of PCBs in urban runoff and recommended approaches for addressing two major sources: past PCBs releases that have contaminated soil and sediments and PCB-containing historic building materials, specifically uncontained materials like sealants, caulking and paint.[2] This project builds on the building materials portion of the CEP report.

The CEP report found that when PCB-containing building materials fail or structures in which they occur are remodeled or demolished, PCBs are released onto the ground and can be washed

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[1] San Francisco Bay Water Board (2004). *PCBs in San Francisco Bay*, TMDL Project Report, January 8.

[2] Larry Walker Associates, TDC Environmental, and Ann Blake (2006). *PCB TMDL Implementation Plan Development*. Prepared for CEP.

off by urban runoff. A survey by the Swiss government of 1,348 buildings constructed between 1950 and 1980 found that almost half of the buildings contained PCBs; almost 10% contained sealants with PCB concentrations exceeding 10% by weight; and that the total PCBs reservoir was an estimated 50-150 metric tons.[3] A less rigorous study was conducted in Boston with similar findings.[4] A Swedish study found that significant quantities of PCBs were released into soil and water runoff during building remodeling.[5]

Management practices have been developed that can prevent PCBs releases from building materials into urban runoff.[6] Both the Swiss and Swedish governments have developed active programs to manage PCB-containing building materials in response to public health concerns (related both to direct exposures and to the adverse effect of PCBs on Europe's fisheries).

PROJECT TEAM AND ROLES

To complete the PCBs in Caulk project, SFEP is partnering with a core project team that includes BASMAA (Bay Area Stormwater Management Agencies Association), the San Francisco Regional Water Quality Control Board, and subcontractors including San Francisco Estuary Institute (SFEI) and TDC Environmental, LLC:

- SFEP will provide project management and coordination, as it does for more than forty projects under a range of local, state, and Federal grants and contracts. SFEP is a project of the Association of Bay Area Governments (ABAG), dedicated to developing and facilitating collaborative regional programs and projects that promote the health of the San Francisco Estuary.
- BASMAA represents and promotes coordinated, consistent stormwater management among urban runoff/stormwater programs for municipalities throughout the Bay Area. BASMAA staff will help coordinate this project with municipal efforts to reduce PCBs in runoff. They will help connect the project to relevant municipal departments such as building permits and inspection. BASMAA staff experience conducting other PCBs studies and projects will inform this project.
- The San Francisco Regional Water Quality Control Board is providing staff input on the project to coordinate with the San Francisco Bay PCBs TMDL and the newly adopted Municipal Regional Permit for Stormwater (MRP, adopted October 14, 2009). The MRP contains stormwater permit regulations for 76 Bay Area municipalities. One requirement of the MRP is for permittees to conduct the same work as outlined in the PCBs in Caulk project, i.e., sample at least ten locations, pilot-test the BMPs, and develop model implementation ordinances or policies.
- SFEI will conduct the scientific assessment of PCB levels in caulk in Bay Area buildings. SFEI is a non-profit organization whose mission is to foster the scientific understanding needed to protect and enhance the San Francisco Estuary and its watershed. Its staff conducts science studies, synthesizes data and information, and collaborates with other scientists to provide a holistic integration of information from many disciplines to support management activities.

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[3] Kohler, M., J. Tremp, et al. (2005). *Environmental Science & Technology* **39**(7): 1967-1973
[4] Herrick, R. F., M. D. McClean, et al. (2004). *Environmental Health Perspectives* **112**(10): 1051-3.
[5] Astebro, A., B. Jansson and U. Bergstrom (2000). *Organohalogen Compounds* **46**: 248-251.
[6] Procedures in other languages have been reviewed and will be translated as appropriate.

- TDC Environmental, LLC is an environmental consulting firm that identified the potential for building materials to be a significant source of PCBs in urban runoff. TDC is providing technical support to SFEP and stakeholders to facilitate effective project implementation based on the latest scientific information
- One additional subcontractor (or team of subcontractors) will be brought on to develop best management practices (BMPs) and an implementation process to prevent release of PCBs from building materials into urban runoff.
- SFEP will convene a stakeholder group that will guide the project and review its products.

STAKEHOLDER WORKGROUP

The stakeholder process for the PCBs in Caulk project includes a workgroup convened by SFEP to assist with project implementation: advising on project direction and review of products. The stakeholder group first met in July 2007 with twenty-plus attendees representing:

- BASMAA
- San Francisco Bay Area municipalities
- Port of San Francisco
- San Francisco Bay Regional Water Board
- California Department of Transportation (Caltrans)
- California Department of Toxic Substances Control
- California Integrated Waste Management Board
- California Office of Environmental Health Hazard Assessment
- U.S. EPA Region 9
- Environmental consultants
- Construction industry
- Environmental nonprofits

A core group will continue to meet periodically to provide guidance during key steps of the project. Ongoing participation is anticipated from (but is not limited to) representatives from U.S. EPA, California Department of Toxic Substances Control, local governments, other agencies, building/construction and demolition industry representatives, and building managers. School districts may join the stakeholder group as well.

Stakeholder meeting points in relation to the development of other products can be found on the new project timeline (following).

PROJECT STRUCTURE AND REVISIONS

Project Structure - Original. The original workplan was approved by the State Water Board in July 2007. It described distinct project phases which were intended to run sequentially, with each successive phase beginning after the preceding phase had been completed. Phases included:

1. The "Local Information Phase," in which SFEI would obtain Bay Area specific information on the presence of PCBs in historic building materials, to help target management actions specifically to the structures most likely to contain PCBs that threaten water quality.
2. The "BMP Development Phase," in which the project would develop (BMPs) and a model implementation process (MIP) to prevent release of PCBs from uncontained building materials into urban runoff. Swiss and Swedish management practices would guide development of Bay Area-specific BMPs.
3. The "Pilot Project Phase," in which BMPs would be piloted in 3-5 municipalities.
4. The "Regional Implementation Phase," in which phased implementation throughout the region would be pursued, with a long-term target of achieving a 10% reduction in PCBs stormwater loads to the Bay.[7]

The initial workplan noted that in practice, some overlap might exist between these conceptual phases; for example, some might begin before others are complete.

Rationale for Changes. The PCBs project has been revised several times, due to difficulties encountered early in the original grant period, the bond freeze period of no work on the project, and external events related to PCBs in caulk that affect this project. Issues and resolutions are summarized below.

Issue: An unforeseen obstacle arose early in the grant period: immediate removal and disposal requirements for PCBs in caulk at levels over 50ppm.

- The project team found that since caulk was not explicitly listed as an exempted use under Toxic Substances Control Act, any sampling that found PCBs over 50ppm would trigger a requirement that the PCB-containing material be removed immediately and treated as hazardous waste. Since the project design included testing materials anticipated to contain PCBs at levels that would often far exceed 50ppm, the immediate cleanup and abatement requirements would incur substantial cost and risk for project sampling partners. The project team discussed the original project plans with potential partners, and became concerned that it would be impossible to find partners willing to sample their buildings for PCBs under those conditions.

Resolution: Liability concerns were addressed through approval to use a blind sampling method, and by increasing the focus on an indicator screening technique and reducing direct sampling.

- In July 2008, the Grant Manager (Susan Gladstone of the San Francisco Regional Board) issued direction that blind sampling would be acceptable: buildings could be sampled without reporting GPS coordinates or other exact identifiers of location.

[7] This target is based on information in Larry Walker Associates, TDC Environmental, and Ann Blake (2006).

- A CEP memo[8] developed with the participation of project suggested using a combination of field screening with portable XRF analysis and confirmation sampling with PCBs measurements by an analytical laboratory. Since XRF screening provides an indicator rather than a direct measurement, using XRF would provide some information about potential PCBs levels in Bay Area buildings but would not necessarily trigger cleanup and liability requirements for sampling partners. In addition, the XRF analyzer device could provide a rapid result and was much less expensive than traditional sampling. The project team was working to shift the balance of sampling towards XRF in late 2008, and stakeholders continued investigations during 2009 under non-grant funds.

Issue: California's bond freeze in December 2008 delayed project implementation

Resolution: The project restarted under ARRA funds in August 2009.

- During the bond freeze, no work took place. Between the grant initiation and the restart, there were numerous turnovers among project staff and stakeholders. Bringing new staff up to speed took time. The project subcontracts also had to be renegotiated.
- The delay also benefited the project in some ways:
    - The project got some external support when the San Francisco Regional Water Board adopted the Municipal Regional Permit (MRP) for Stormwater (October 14, 2009). The MRP (Provision C.12.b) requires its 76 permittees to conduct the same tasks as outlined in this project. This requirement should help reduce the difficulty in finding sampling partners. The MRP requires permittees to implement sampling and analysis at 10 sites around the Bay Area, and to pilot test BMPs at 5 sites around the Bay Area.
    - U.S. EPA began outreach to distribute information about PCBs in caulk in schools. The presence of PCBs in building materials is becoming a widely recognized issue with a higher profile than it had at the start of the project. In September 2009, EPA launched a major campaign for building owners and facilities managers—particularly those at school districts—to test for and manage PCBs in caulk. The increased visibility may help the project team partner with interested school districts or other entities to pilot sampling and BMPs, and renews EPA's commitment to the project.

Project Structure Revisions. The project structure is now reframed from sequential phases to concurrent execution of the Local Information and BMPs Development phases, followed by the Pilot Project phase. The attached project timeline illustrates the sequence and timing of the various steps included in the project.

The original sequential structure included a "go/no-go decision" after Phase 1 (Local Information Phase), intended to ensure that enough PCBs in caulk were found locally to justify the pursuing the remaining project phases. The project team met before the bond freeze to discuss concerns about project timing, and with approval from Grant Manager Susan Gladstone decided that a go/no-go decision was not needed in light of the dramatic increase in work and literature on PCBs in caulk in the three years since the original project proposal, including numerous high-profile remediation projects on the East Coast and guidance from U.S. EPA. Based on this

[8] TDC Environmental, SFEI, et al. (2007). *First Phase Support Information for PCB Portion of Taking Action for Clean Water Grant*. Prepared for CEP.

information it appears safe to assume that PCBs are present in caulking in Bay Area buildings. The Local Information Phase remains in the project, but its purpose is to inform development of management practices by obtaining as much detailed local information as possible about what types of buildings, materials, etc. contain caulking with PCB levels of concern. The revised project structure now has the BMPs and model implementation process being developed concurrently with the local information phase.

In the current organization, implementation trials are scheduled to begin after the BMPs and model implementation process have been developed and been reviewed by the stakeholder group. Restructuring the project allows for maximum time/ flexibility to conduct implementation trials. The economic slowdown has reduced the pace of demolition/renovation activities, so getting started on BMP development earlier allows us to be more opportunistic in seeking sites.

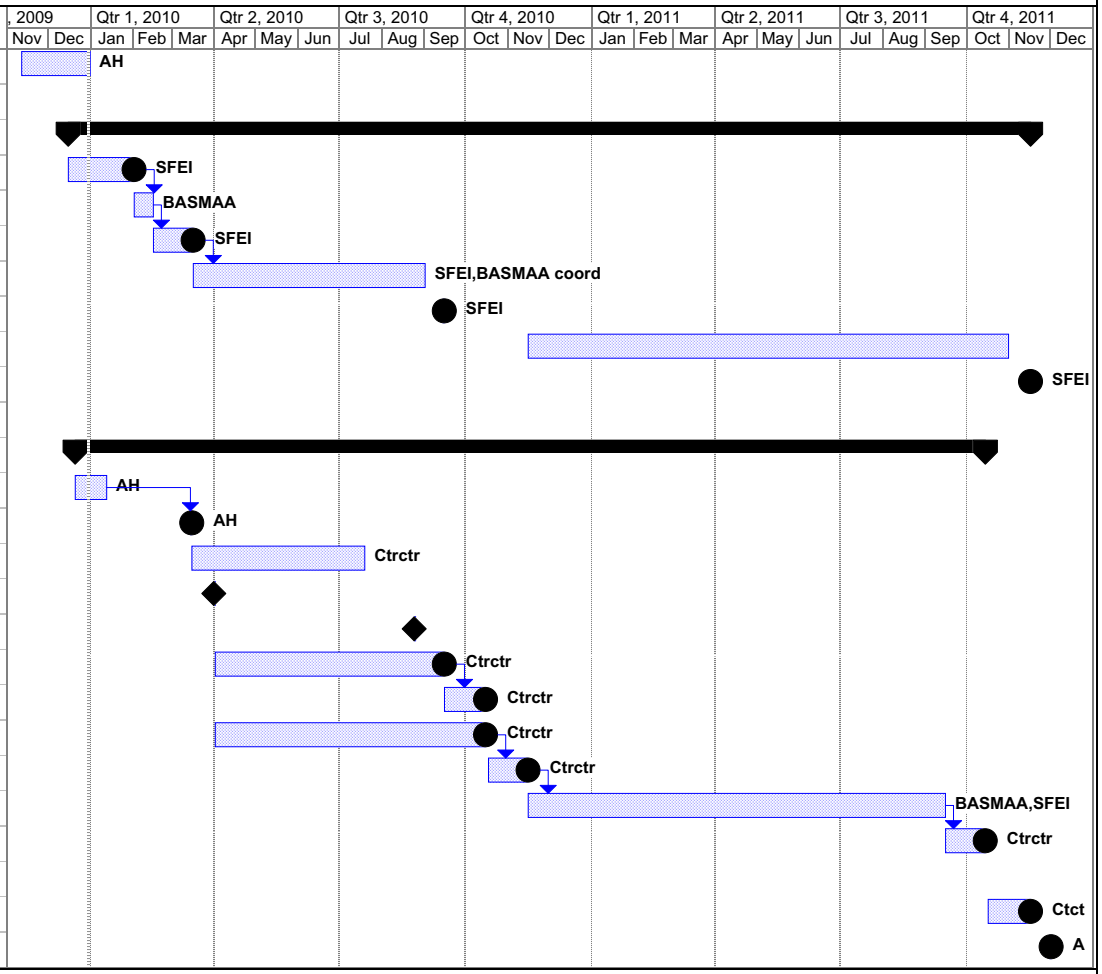
The Regional Implementation Phase has been eliminated from the project because it would not be possible to complete under the remaining time in the grant. The project will prepare for phased regionwide implementation by providing technology transfer to municipalities and appropriate parties and stakeholders. The project team, including BASMAA and the San Francisco Regional Water Quality Control Board, will be involved in discussions regarding next steps for the project after the grant period is completed, including feasibility of regionwide implementation.

In December 2009, SFEP requested extension of the final deadlines from June 2011 to December 2011. These revised end dates will allow meaningful trials of the BMPs developed in earlier phases of the project. The dates listed in the Project Schedule and Deliverables section below are these proposed dates. Some project deadlines have been moved earlier, such as the draft and revised BMPs and draft and revised implementation process.

The project concludes with a final report from SFEI, training materials and technology transfer, and an effectiveness evaluation as part of the final project report by SFEP.

PCBs in Caulk Revised Timeline, December 2009

ID	Task Name	Start	Finish
1	Revise workplan	Thu 11/12/09	Thu 12/31/09
2			
3	**Obtain Bay Area specific estimates on loadings to runoff from histc**	**Wed 12/16/09**	**Wed 11/16/11**
4	Monitoring Plan and QAPP draft	Wed 12/16/09	Mon 2/1/10
5	BASMAA Review & feedback	Tue 2/2/10	Mon 2/15/10
6	Monitoring Plan and QAPP final	Tue 2/16/10	Tue 3/16/10
7	Monitoring & chemical analysis, round 1	Wed 3/17/10	Wed 9/1/10
8	Draft report	Wed 9/15/10	Wed 9/15/10
9	Monitoring & chemical analysis, round 2 (implementation trials)	Tue 11/16/10	Mon 10/31/11
10	Final report	Wed 11/16/11	Wed 11/16/11
11			
12	**Develop written BMPs and Model Implementation Process (IP)**	**Mon 12/21/09**	**Fri 10/14/11**
13	Complete RFP (AH writes, BASMAA reviews)	Mon 12/21/09	Tue 1/12/10
14	Hire contractor	Mon 3/15/10	Mon 3/15/10
15	Research existing regulatory controls/policies re haz matls in demo/	Tue 3/16/10	Mon 7/19/10
16	Convene stakeholder group	Thu 4/1/10	Thu 4/1/10
17	Stakeholder group meets- feedback on prelim BMPs, MIP	Wed 8/25/10	Wed 8/25/10
18	Draft BMPs complete	Fri 4/2/10	Wed 9/15/10
19	Revise BMPs	Thu 9/16/10	Fri 10/15/10
20	Draft IP, model reg ctrls/policies, training matls	Fri 4/2/10	Fri 10/15/10
21	Revised IP, model reg ctrls/policies, TMs	Mon 10/18/10	Mon 11/15/10
22	Implementation trials for BMPs/IP	Tue 11/16/10	Thu 9/15/11
23	Final BMPs, IP, Tr Matls, and checklists	Fri 9/16/11	Fri 10/14/11
24			
25	Tech transfer	Mon 10/17/11	Wed 11/16/11
26	Effectiveness evaluation (per PAEP)	Thu 12/1/11	Thu 12/1/11



Project: PCBsInCaulkRevisedTimeline
Date: Wed 12/30/09

Task | Progress | Summary | External Tasks | Deadline
Split | Milestone | Project Summary | External Milestone

PROJECT ACTIVITIES AND TASKS

Specific project tasks are listed below. These are taken from the grant agreement and are identified by grant task number.

7.5 Decrease Polychlorinated biphenyl (PCB) Contamination in Urban Runoff

7.5.1 Workplan Revision

7.5.1.1 Revise workplan and submit to Project Manager for review.
[this document]

7.5.1.2 Complete final workplan in accordance with Project Manager comments.

7.5.2 Obtain Bay Area specific estimates on PCB loadings to urban runoff from historic building materials.

7.5.2.1 Define procedures to identify structures that contain PCBs in their building materials.

7.5.2.2 Conduct field sampling and chemical analysis, as possible.

7.5.2.3 Analyze data and estimate PCB loadings from representative types of structures.

7.5.2.4 Produce draft report and submit for Project Manager review.

7.5.2.5 Complete final report in accordance with Project Manager comments.

7.5.3 Develop written BMP's and Model Implementation Process

7.5.3.1 Convene stakeholder implementation work group comprised of partner representatives, municipal staff, and regulatory agency staff tasked with providing guidance and reviewing drafts of Project deliverables.

7.5.3.2 Research existing regulatory controls/policies related to managing wastes and hazardous materials during building demolition/remodeling programs.

7.5.3.3 Develop proposed best management practices (BMPs) to reduce or prevent discharge of PCBs during building demolition/remodeling. The BMPs will focus on methods to identify PCB-containing building materials and properly manage those materials through aspects such as handling, containing, transport, and disposal. Provide draft BMPs to work group and Project Manager for review.

7.5.3.4 Finalize BMPs in accordance with comments received and submit to Project Manager.

7.5.3.5 Develop implementation process and define circumstances that would trigger BMP implementation including model municipal regulatory controls/policies/ordinances. Develop training materials, including checklist(s), for building inspectors or other municipal staff who will be implementing BMPs. Provide implementation process and training materials to work group and Project Manager for review.

7.5.3.6 Revise implementation process, training materials, and checklist(s) in accordance with comments received and submit to Project Manager.

7.5.4 Implement up to five (5) trials using the BMPs and implementation process developed.

7.5.4.1 Identify up to five (5) municipalities willing to work with Project staff and Bay Area Stormwater Management Agencies Association (BASMAA) to perform trials of the implementation process and BMPs, as possible.

7.5.4.2 Implement trials to test and evaluate the BMPs and implementation process, as possible.

7.5.4.3 Include status reports on trials in quarterly progress reports.

7.5.5 Prepare for phased region-wide BMP implementation by providing technology transfer to municipalities and other appropriate parties and stakeholders.

7.5.5.1 Revise BMPs implementation process, and training materials based on the lessons learned during the work item 7.5.4 trials. Provide revised BMPs and implementation process to work group and Project Manager for review.

7.5.5.2 Finalize revised BMPs, implementation process, and training materials in accordance with comments received and submit to Project Manager.

7.5.5.3 To prepare for phased region-wide implementation, provide technology transfer to municipalities and other appropriate parties and stakeholders. Submit technology transfer materials to Project Manager.

7.5.6 Conduct effectiveness evaluation in accordance with PAEP and submit to Project Manager.

PROJECT SCHEDULE AND DELIVERABLES

The table below reflects the project schedule and deliverables listed in the grant agreement (with date modifications as proposed). SFEP submitted proposed modifications of several due dates in the contract to the Grant Manager in early December 2009. The request included moving out the final deliverables from June 2011 to December 2011. The additional six months are needed to allow for meaningful trials of the BMPs developed in the early phases of the project. Though enrolling project partners is no longer impossible, it will likely remain difficult, since partners will incur additional costs and liability concerns. The additional time will also help us make robust efforts to secure sampling partners.

The vision for the project is to create a foundation for a majority of Bay Area cities to adopt ordinances or policies requiring the use of the BMPs and implementation process developed in this pilot. We believe the date modifications are essential to creating BMPs which can provide meaningful reductions in PCB loading to San Francisco Bay under the PCBs TMDL and which also can be adopted widely in the future rather than shelved because they are considered overly onerous.

Item	DESCRIPTION	ESTIMATED DUE DATE
SCOPE OF WORK		
7.5.1.1	Draft and Final Workplans - Revision	December 2009
7.5.2.4	Draft Report on PCBs in building materials	September 2010
7.5.2.5	Final Report on PCBs in building materials	November 2011
7.5.3.3 7.5.3.4	Draft and Final Preliminary BMPs for PCBs in building materials	September and October 2010
7.5.3.5 7.5.3.6	Draft and Final Preliminary implementation process; model regulatory controls and/or policies; training materials for PCBs in building materials	October and November 2010
7.5.4.3	Status reports on PCB implementation trials	Quarterly
7.5.5.1 7.5.5.2	Draft and Final Revised BMPs, implementation process, training materials for PCBs	September and October 2011
7.5.5.3	Technology transfer materials for PCBs	November 2011
7.5.6	Effectiveness evaluation	December 2011

PROJECT EVALUATION

The Project Assessment and Evaluation Plan (May 2007) provides a plan for evaluating project successes. Evaluation is based on both output and outcome indicators. Output indicators are designed to provide low-cost, easy to measure, quick-response tracking of project activity levels. Outcome indicators involve monitoring of environmental and other types of data that link directly to the goals of each TMDL being implemented. SFEP will report on output indicators in each quarterly project report. Outcome indicators will be assessed at the end of the project; the project outcome evaluation will be included in the in the final project report.

CONCLUSION

This concludes the revised workplan. The original workplan narrative and timeline graphics are included next for reference.

STRUCTURAL PCBs PROJECT WORKPLAN

TAKING ACTION FOR CLEAN WATER:
BAY AREA TMDL IMPLEMENTATION

OLD

Agreement #06-342-552-0
between the State Water Resources Control Board
and the Association of Bay Area Governments

Prepared by:
TDC Environmental, LLC and the San Francisco Estuary Project

July 2007

STRUCTURAL PCBs PROJECT WORKPLAN

INTRODUCTION

This is a workplan for the polychlorinated biphenyls (PCBs)-related actions that comprise a portion of a larger San Francisco Estuary Project (SFEP) grant-funded program, the Taking Action for Clean Water Project. The Taking Action for Clean Water Project will implement water quality improvement actions to protect California coastal waters with Proposition 50 Coastal Nonpoint Source funding. Among the actions to be implemented under the Taking Action for Clean Water Project are activities to improve management of PCBs that remain in Bay Area structures to prevent release into urban runoff; these actions are called the "Structural PCBs Project."

PROJECT OVERVIEW

Background. Elevated PCB levels threaten the health of people and wildlife consuming fish from San Francisco Bay. A TMDL to address PCB impairment of all segments of San Francisco Bay is in development. The San Francisco Bay PCBs TMDL Project Report found that urban runoff was one of the major sources of PCBs loads to the Bay and concluded that controlling PCBs sources in urban runoff was one of two top priorities for TMDL implementation.[1]

Based on this conclusion, the Clean Estuary Partnership (CEP) evaluated available data on sources of PCBs in urban runoff and recommended approaches for addressing past PCBs releases that have contaminated soil and sediments and PCB-containing historic building materials, specifically uncontained materials like sealants, caulking and paint.[2] This project builds on the structural PCBs portion of the CEP report.

The CEP report found that when PCB-containing building materials fail or structures are remodeled or demolished, PCBs are released onto the ground and can be washed off by urban runoff. A survey by the Swiss government of 1,348 buildings constructed between 1950 and 1980 found that almost half of the buildings contained PCBs; almost 10% contained sealants with PCB concentrations exceeding 10% by weight; and that the total PCBs reservoir was an estimated 50-150 metric tons.[3] A less rigorous study was conducted in Boston with similar findings.[4] A Swedish study found that significant quantities of PCBs were released into soil and water runoff during building remodeling.[5]

Management practices have been developed that can prevent PCBs releases from structural materials into urban runoff.[6] Both the Swiss and Swedish governments have developed active programs to manage PCB-containing building materials in response to

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[1] San Francisco Bay Water Board (2004). *PCBs in San Francisco Bay*, TMDL Project Report, January 8.
[2] Larry Walker Associates, TDC Environmental, and Ann Blake (2006). *PCB TMDL Implementation Plan Development*. Prepared for CEP.
[3] Kohler, M., J. Tremp et al. (2005). *Environmental Science & Technology* **39**(7): 1967-1973
[4] Herrick, R. F., M. D. McClean, et al. (2004). *Environmental Health Perspectives* **112**(10): 1051-3.
[5] Astebro, A., B. Jansson and U. Bergstrom (2000). *Organohalogen Compounds* **46**: 248-251.
[6] These procedures are in German, French, and Swedish; they have been reviewed and will be translated as appropriate.

public health concerns (related both to direct exposures and to the adverse effect of PCBs on Europe's fisheries).

Project Team. To complete the Structural PCBs Project, SFEP will partner with BASMAA (Bay Area Stormwater Management Agencies Association) and the San Francisco Estuary Institute (SFEI) to develop and implement a best management practices (BMPs)-based source reduction program to prevent release of PCBs from building materials into urban runoff. TDC Environmental, LLC is providing technical support to SFEP and stakeholders to facilitate effective project implementation based on the latest scientific information. SFEP will convene a stakeholder group that it will engage in the project.

Four Project Phases. The Structural PCBs Project will be implemented in four phases.

- In the first phase (the "Local Information Phase"), the San Francisco Estuary Institute will obtain Bay Area specific information on the presence of PCBs in historic building materials. Obtaining Bay Area-specific information will allow management actions to be targeted specifically to the structures most likely to contain PCBs that threaten water quality.
- Using the Swiss and Swedish management practices as a guide, the Taking Action for Clean Water Project will partner with the Bay Area Stormwater Management Agencies Association (BASMAA) and its member cities to develop Bay Area-specific best management practices (BMPs) and a model implementation process (MIP) to prevent release of PCBs from unregulated, uncontained building materials (such as sealants and paints) into urban runoff (the "BMP Development Phase").
- In the "Pilot Project Phase," BMPs will be piloted in 3-5 municipalities.
- Subsequently, regionwide phased implementation will be pursued (the "Regional Implementation Phase"), with a long-term target of achieving a 10% reduction in PCBs stormwater loads to the Bay.[7]
- At the end of the grant-funded portion of the project, SFEP will evaluate project outcomes and complete a final project report.

Please note that some overlap may exist between these phases; for example, SFEP and its partners may begin working with potential sites for the pilot phase of the project before the BMP Development Phase is complete. The attached **Structural PCBs Project Overview** figure provides the framework for the project, lays out the overall project schedule, and shows how the project relates to pre-project activities funded by other agencies.

[7] This target is based on information in Larry Walker Associates, TDC Environmental, and Ann Blake (2006).

PROJECT ACTIVITIES AND TASKS

Specific project tasks are listed below. These are taken from the grant agreement and are identified by grant task number.

6.1 Develop Workplan for Task 6 *[This document]*
- 6.1.1 Prepare draft workplan and submit for Grant Manager review and approval.
- 6.1.2 Complete final workplan in accordance with Grant Manager comments.

6.2 Obtain Bay Area specific information on PCB loadings to urban runoff from historic building materials.
- 6.2.1 Define procedures to identify structures that contain PCBs in their building materials.
- 6.2.3 Conduct field sampling and chemical analysis.
- 6.2.4 Analyze data and estimate PCB loadings from representative types of structures.
- 6.2.5 Produce draft report and submit for Grant Manager review and approval.
- 6.2.6 Complete final report in accordance with Grant Manager comments.

6.3 Develop written BMP's and Model Implementation Process
- 6.3.1 Convene stakeholder implementation work group comprised of partner representatives, municipal staff, and regulatory agency staff tasked with providing guidance and reviewing drafts of project deliverables.
- 6.3.2 Research existing regulatory controls/policies related to managing wastes and hazardous materials during building demolition/remodeling programs. Task may include review of regulations re: PCBs in solid waste.
- 6.3.3 Develop proposed best management practices (BMPs) to reduce or prevent discharge of PCBs during building demolition/remodeling. The BMPs will focus on methods to identify, handle, contain, transport, and properly dispose of PCB-containing building materials. Task may include collecting and reviewing existing dust control BMPs. Provide draft BMPs to work group and Grant Manager for review.
- 6.3.4 Finalize BMPs in accordance with comments received and submit for Grant Manager approval.
- 6.3.5 Develop implementation process to define circumstances that would trigger BMP implementation including model municipal regulatory controls/policies. Develop training materials, including checklist(s), for building inspectors or other municipal staff who will be implementing BMPs. Provide implementation process and training materials to work group and Grant Manager for review.

OLD

6.3.6 Revise implementation process, training materials, and checklist(s) in accordance with comments received and submit for Grant Manager approval.

6.4 Implement three (3) to five (5) trials using the BMP's and implementation process developed.

6.4.1 Identify three (3) to five (5) municipalities willing to work with project staff and BASMAA to perform trials of the implementation process and BMPs.

6.4.2 Implement trials to test and evaluate the BMPs and implementation process.

6.4.3 Include status reports on trials in quarterly progress reports.

6.5 Conduct phased region-wide implementation and provide technology transfer to municipalities and other appropriate parties and stakeholders.

6.5.1 Revise BMPs implementation process, and training materials based on the lessons learned during the work item 6.4 trials. Provide revised BMPs and implementation process to work group and Grant Manager for review

6.5.2 Finalize revised BMPs, implementation process, and training materials in accordance with comments received and submit for Grant Manager approval.

6.5.3 Conduct phased region-wide implementation and provide technology transfer to municipalities and other appropriate parties and stakeholders. Task may include providing information to the California Stormwater Quality Association and CalTrans, both of which have construction BMP manuals.

6.6 Conduct effectiveness evaluation in accordance with Project Assessment and Evaluation Plan (PAEP) and submit to Grant Manager.

KEY DECISION POINTS

The project involves an estimated eleven key decision points. Four attached figures (**Structural PCBs Project Key Decision Points**) identify key decisions and their anticipated timing, by project phase, for the entire project.

STAKEHOLDER GROUP

The stakeholder process for the Structural PCBs Project will include a workgroup convened by SFEP to assist with project implementation. The workgroup will meet periodically to provide guidance during key steps of the project. The workgroup is anticipated to include (but is not limited to) representatives from the following organizations and interest groups:

- BASMAA
- San Francisco Bay Area municipalities
- San Francisco Bay Regional Water Board
- California Department of Transportation (Caltrans)
- California Department of Toxic Substances Control
- California Integrated Waste Management Board
- California Office of Environmental Health Hazard Assessment
- U.S. EPA Region 9
- Construction industry
- Environmental nonprofits

The Estuary Project will also involve other stakeholders to the extent appropriate, such as the Bay Area Air Quality Management District, the California Department of Health Services, and Cal –OSHA. The attached **Structural PCBs Project Overview – Key Times for Stakeholder Engagement** figure shows, by calendar quarter, when stakeholder engagement is anticipated. Stakeholder review and input to project work products will also be sought; the attached figure also lists work products for stakeholder input at each project phase.

PROJECT EVALUATION

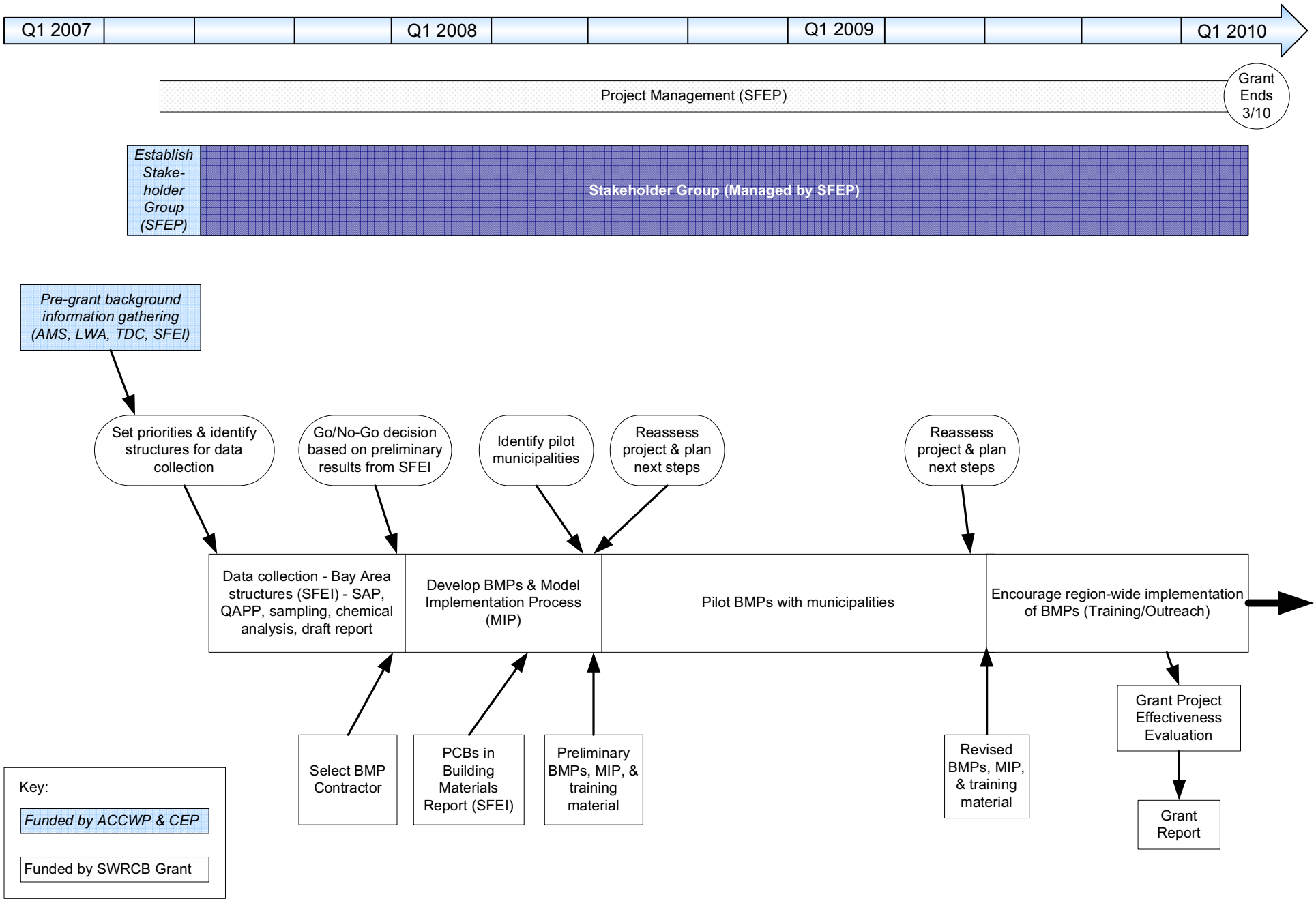
The Project Assessment and Evaluation Plan (Draft, May 2007) provides a plan for evaluating project successes. Evaluation is based on both output and outcome indicators. Output indicators are designed to provide low-cost, easy to measure, quick-response tracking of project activity levels. Outcome indicators involve monitoring of environmental and other types of data that link directly to the goals of each TMDL being implemented. SFEP will report on output indicators in each quarterly project report. Outcome indicators will be assessed at the end of the project; the project outcome evaluation will be included in the in the final project report.

PROJECT SCHEDULE AND DELIVERABLES

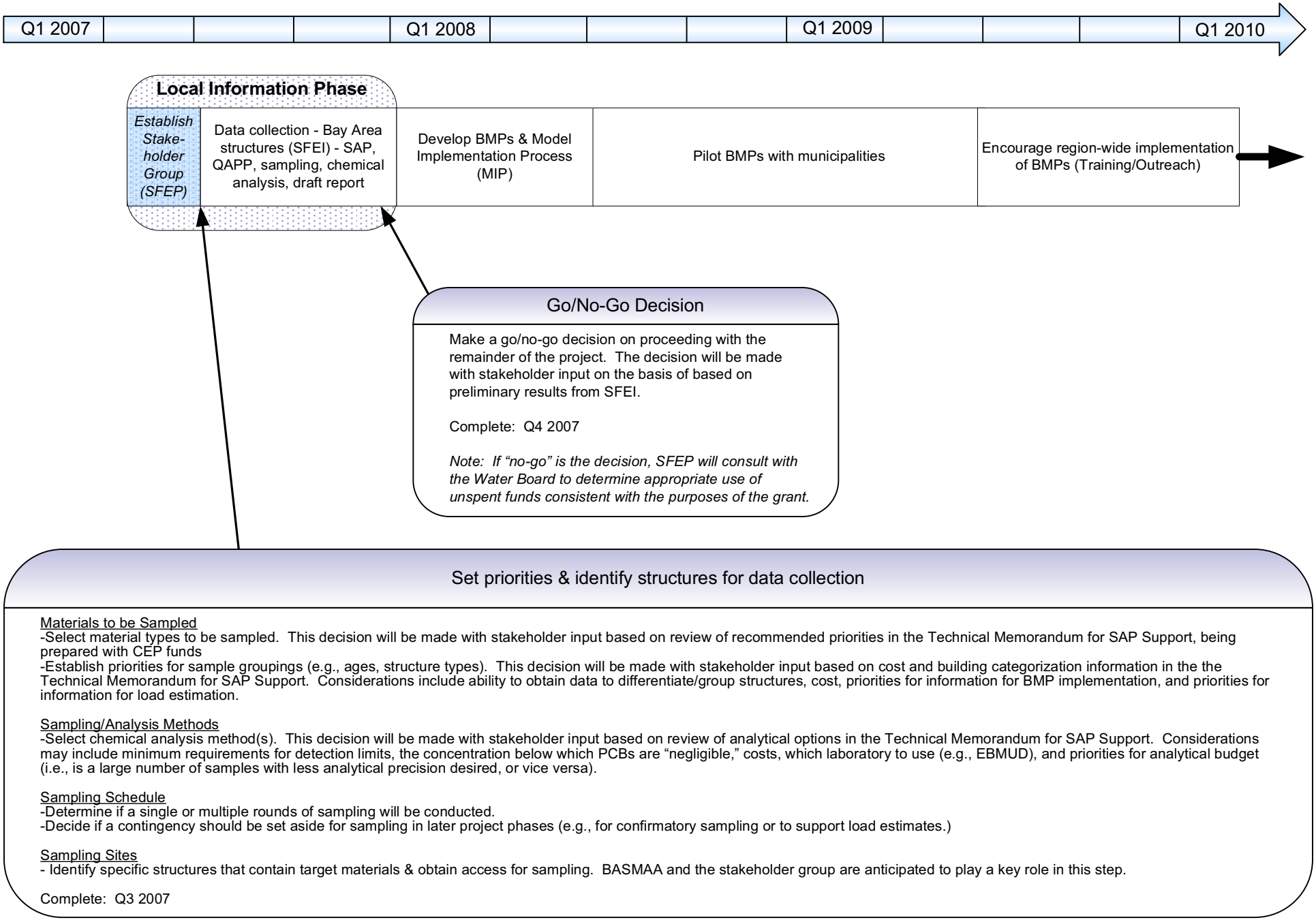
The table on the next page reflects the project schedule and deliverables listed in the grant agreement. The anticipated project schedule shown in the attached figures is somewhat more aggressive than the schedule required by the grant because SFEP would prefer to have as long as possible for the pilot project and regional implementation phases.

OLD

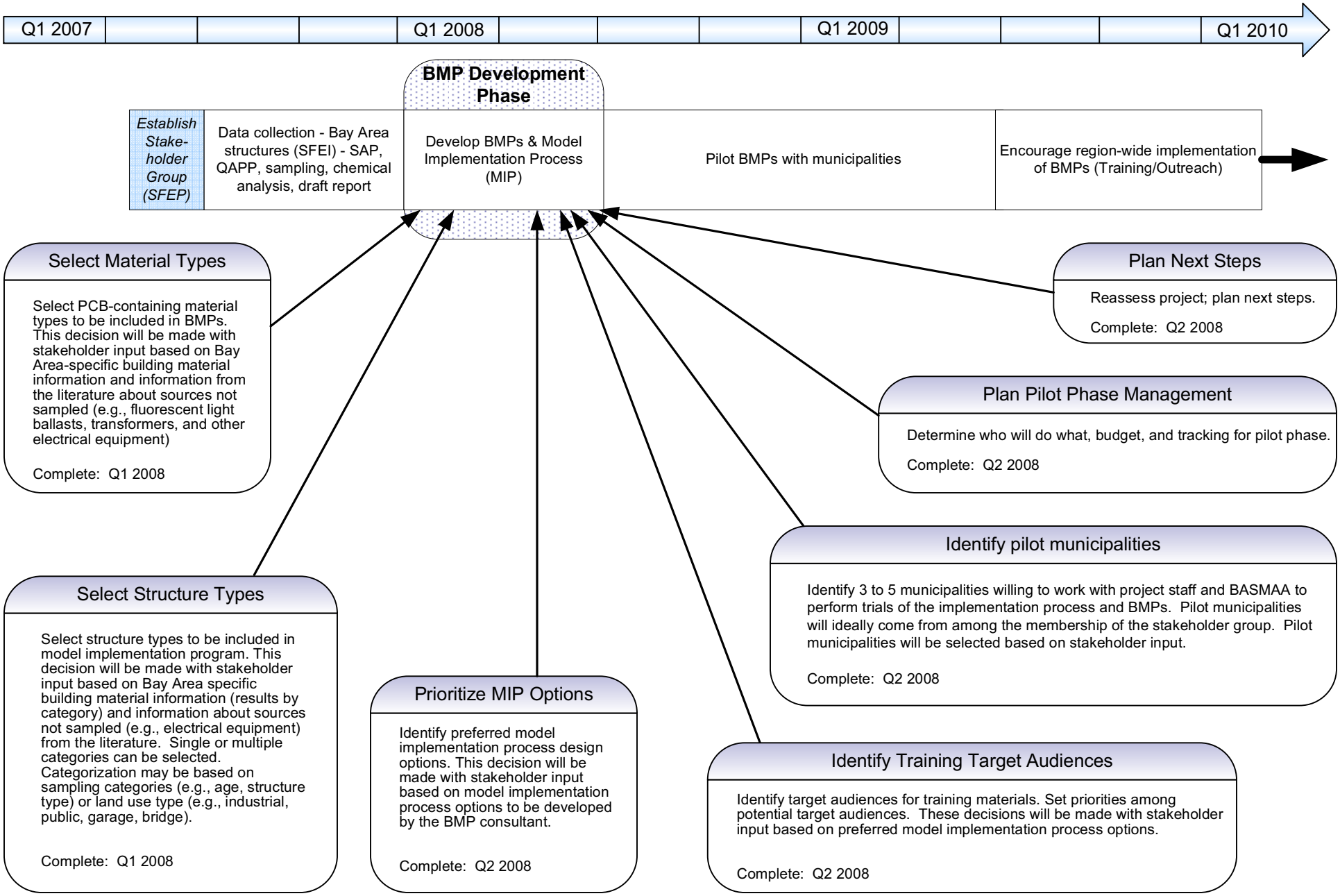
Structural PCBs Project Overview



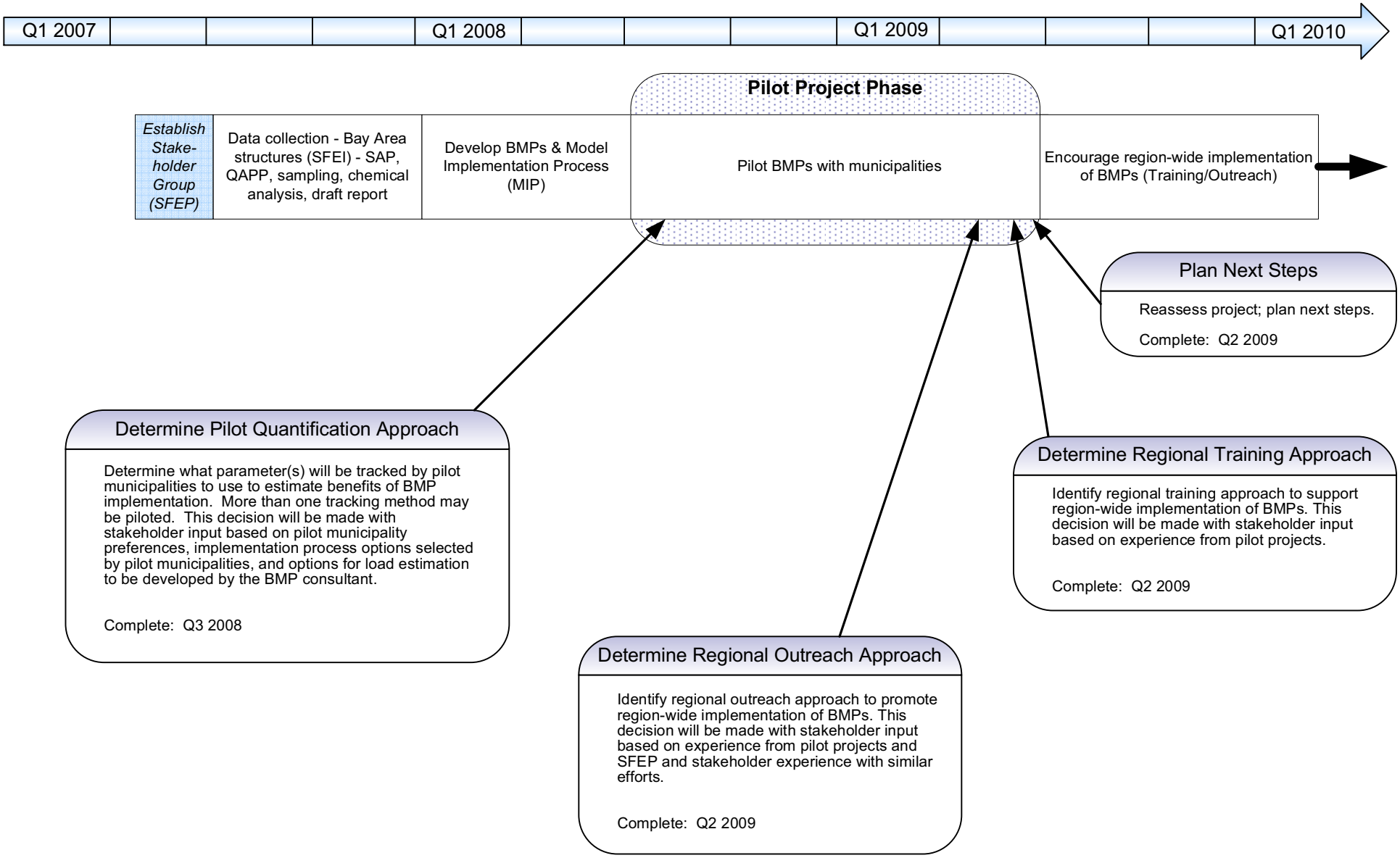
~~Structural PCBs Project Key Decision Points - Local Information Phase~~



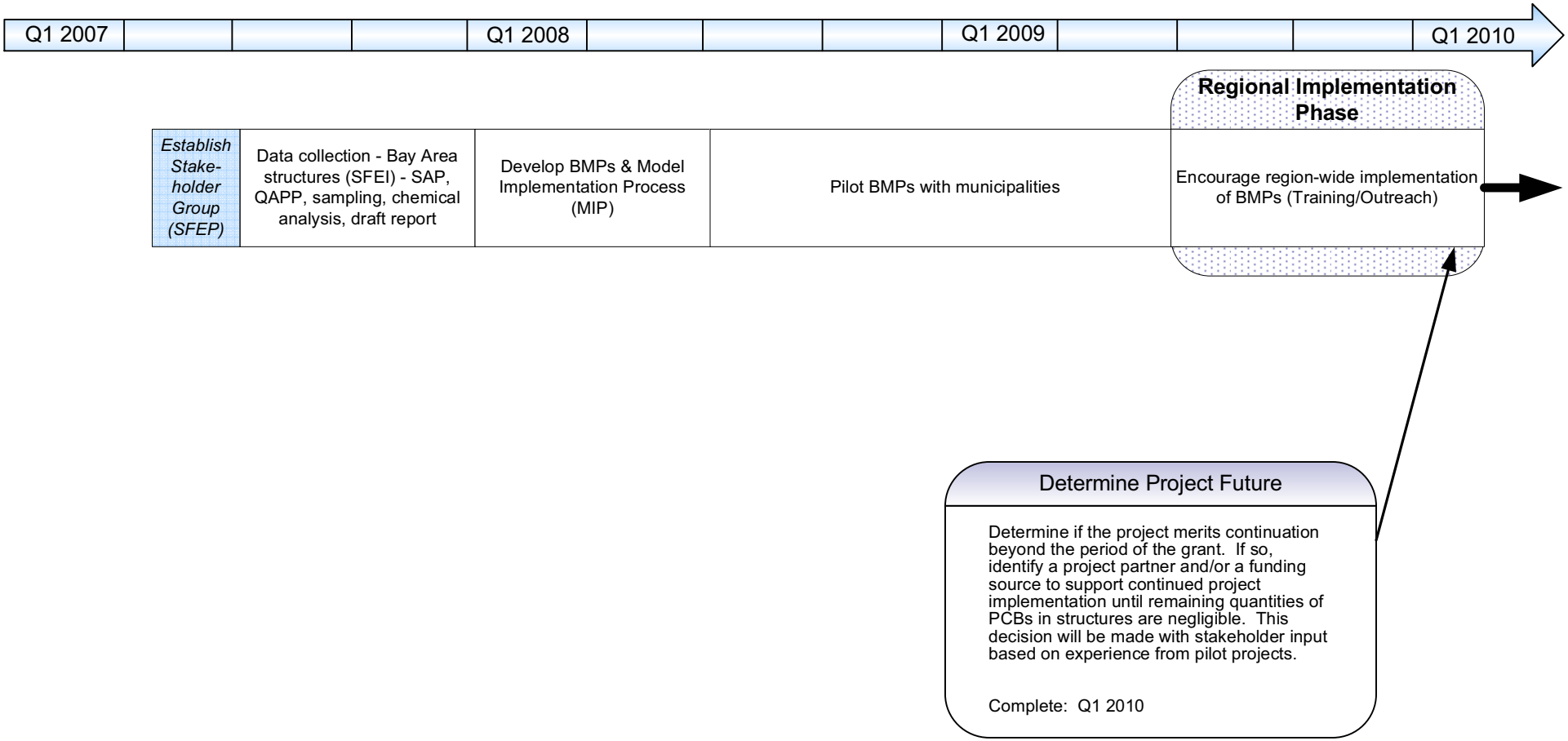
Structural PCBs Project Key Decision Points - BMP Development Phase



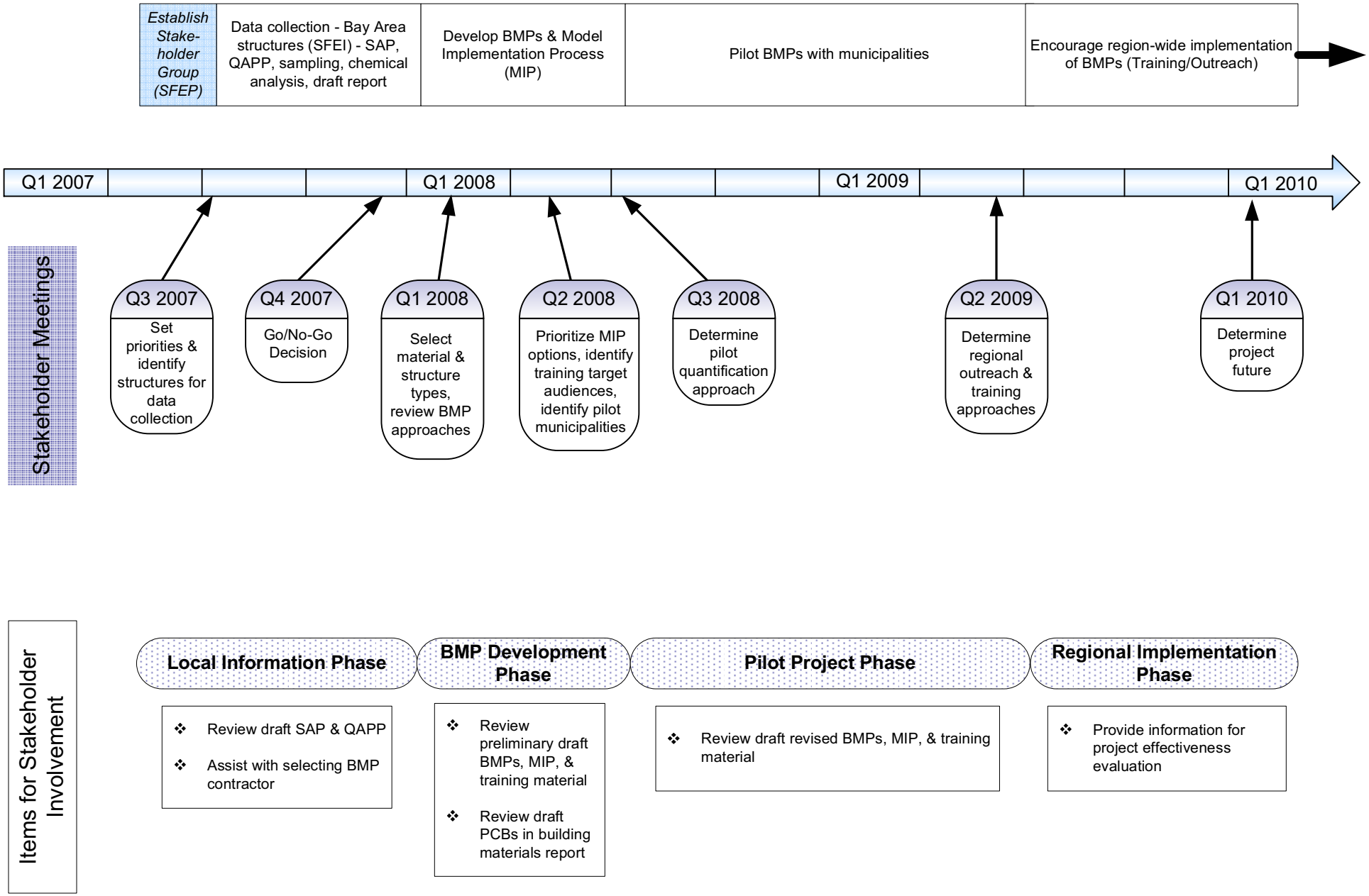
~~Structural PCBs Project Key Decision Points - Pilot Project Phase~~



~~Structural PCBs Project Key Decision Points - Regional Implementation Phase~~



~~Structural PCBs Project Overview - Key Times for Stakeholder Engagement~~



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DRAFT

Field Sampling and Chemical Analysis Plan for the PCBs in Caulk Project (Taking Action for Clean Water Bay Area TMDL Implementation)

Subcontract for SWRCB Agreement No. 09-305-550-1 with
Association of Bay Area Governments

Prepared by
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San Francisco Estuary Institute

July 2010

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1. Project Management

1.1 Project Background

Elevated polychlorinated biphenyl (PCB) levels threaten the heath of people and wildlife consuming fish from San Francisco Bay (RWQCB, 2008). A Total Maximum Daily Load (TMDL) to address PCB impairment of all segments of San Francisco Bay was adopted by the San Francisco Bay Regional Water Quality Control Board in February 2008. The San Francisco Bay PCBs TMDL Project Report (RWQCB 2004) found that urban runoff was one of the major sources of PCB loads to the Bay and concluded that controlling sources of PCBs to urban runoff was one of two top priorities for TMDL implementation. Based on this recommendation, the Clean Estuary Partnership (CEP) evaluated available data on sources of PCBs in urban runoff and recommended approaches for addressing two potentially significant sources, past PCBs releases that have contaminated soil and sediments and PCB-containing historic building materials, specifically uncontained materials like sealants, caulking and paint (LWA et al. 2006). When the building materials fail or buildings are remodeled, residues can be transported away from the building during rainstorms, through landscape irrigation overflows, or by pavement washing (forecourts and footpaths surrounding the buildings) and find their way into the stormwater drainage system. In addition, when buildings are demolished, PCBs may be released onto the ground and can be washed off into stormwater drains by rainfall. While these are logical pathways, we lack data to determine which buildings have PCBs at levels that may be concerning, the magnitude of losses to stormwater, or how PCBs in buildings could be better managed.

A survey of 1,348 buildings in Switzerland constructed between 1950 and 1980 found that almost half of the buildings contained PCBs, almost 10% of the buildings contained sealants with PCB concentrations exceeding 10% by weight, and the total PCBs reservoir in Switzerland was an estimated 50-150 metric tons (Kohler et al. 2005). Less rigorous studies have been conducted in Boston (Herrick et al. 2004) and Toronto (Melymuk et al. 2008) with similar findings; however no such evaluation is known for California. A Swedish study also found that significant quantities of PCBs were released into soil and water runoff during building remodeling (Astebro et al. 2000). Both the Swiss and Swedish governments have developed active programs to manage PCB-containing building materials in response to public health concerns, which relate to both direct exposures and the adverse effect of PCBs on Europe's fisheries.

In 2007 the California State Water Resources Control Board awarded the Association of Bay Area Governments (ABAG) a grant that includes several tasks for implementation of Bay Area Total Maximum Daily Loads (TMDLs). The project was halted under the state bond freeze in December 2008 and restarted under the American Recovery and Reinvestment Act of 2009 (ARRA) through the State Revolving Fund in August of 2009. One of the tasks in the master grant is the PCBs in Caulk Project (referred to herein as the Project), which includes characterizing the use of PCBs in historic building materials in the San Francisco Bay Area. The San Francisco Estuary Institute (SFEI) is the subcontractor for Task 7.5.2.2 of SWRCB Agreement No. 09-305-550-01. This Field Sampling and Chemical Analysis Plan (SAP) outlines procedures to be followed by project personnel to insure usability and representativeness of data

collected through the Project implementation. The SAP will be submitted to the State Water Resources Control Board (SWRCB) as part of the work to complete Task 7.5.2.2 of the master agreement, and under Task 1 of SFEI's subcontract under that agreement, which has a term of January 27, 2010 through December 1, 2011.

1.2 Project Description

The objective of this element of the PCBs in Caulk Project is to obtain Bay Area-specific estimates on PCB loadings to urban runoff from historic building materials. While many structures were historically built with a variety of materials known to contain PCBs, including caulking/sealants, grouts, paints, and flame retardant coatings of acoustic ceiling tiles, the focus of this Project is caulking/sealants that were used between rigid components of buildings and other structures. The results from implementing this SAP will inform the development of BMPs for the handling of PCB-contaminated caulking. This SAP contains information on the data-collection phase of the Project, which will obtain Bay Area-specific information on the presence of PCBs in sealants used in historic buildings and other structures.

In collaboration with Bay Area Stormwater Management Agencies Association (BASMAA), the San Francisco Bay Regional Water Quality Control Board (Water Board), and local municipalities, the San Francisco Estuary Institute (SFEI) will test or sample structures that have the potential to contain PCBs in their exterior sealants or caulking (herein referred to as only 'sealants'). Other members of the Project team will identify buildings and secure permission to test a minimum of ten Bay Area structures. Structures to be tested or sampled will be identified based on structure type, year of construction, and whether or not the sealants have been replaced or renovated since the original date of construction. Based on the results of this identification process, and in cooperation with structure owners, this SAP will be implemented to obtain Bay Area-specific information on the PCB content of sealants. As appropriate, data generated from the sampling phase will be used to support BMP development and implementation. All testing and sampling conducted during the above-mentioned activities will be in compliance with this SAP.

It is likely that sealant testing in participating buildings or structures will occur through the use of a portable X-ray fluorescence (XRF) detector to estimate PCB concentrations. If permission is granted, physical sealant samples will be collected from structures and sent to a qualified analytical laboratory for confirmation of PCB content according to the Project Quality Assurance Project Plan (QAPP).

1.3 Project Organization and Responsibilities

The project will make use of the cooperative efforts of several parties involved in the design and implementation of the various components of the project. The main roles and responsibilities are defined below.

1.3.1. SWRCB Project Manager (Kari Holmes, California State Water Resources Control Board)

The SWRCB Project Manager oversees performance of the project agreement and monitors progress of the project. Technical review will be delegated to Jan O'Hara at the San Francisco Bay Regional Water Quality Control Board.

1.3.2 Project Manager (Athena Honore, ABAG/SFEP)

The Project Manager will be responsible for ensuring that all work performed through the Project is consistent with the project proposal and objectives, and for oversight of all efforts associated with the project. Additionally, the Project Manager will act as the liaison between the Contractor and the SWRCB Project Manager.

1.3.3 Contractor (SFEI)

The Contractor will be responsible for all efforts associated with the data collection phase, including SAP and QAPP development, data and sample collection, data management and interpretation, and reporting. The Contractor is also responsible for oversight of the subcontractor performing the laboratory analysis.

1.3.4 Contractor Project Manager (Susan Klosterhaus, SFEI)

The Contractor Project Manager will be responsible for ensuring that testing and sampling personnel adhere to the provisions of the QAPP and SAP. The Contractor Project Manager is also responsible for custody of any samples collected until receipt by the analytical laboratory.

1.3.5 Data Manager (Don Yee or Jay Davis, SFEI)

The Data Manager will be responsible for receipt and review of all project related documentation and reporting associated with laboratory PCB analysis. The Data Manager will serve as the project quality assurance officer and will be responsible for verifying compliance of all analytical data with the requirements established by the Project QAPP before its use for interpretive purposes.

1.3.6 Project Chemist (Francois Rodigari, East Bay Municipal Utility District)

The Project Chemist at the selected analytical laboratory will be responsible for ensuring that the laboratory's quality assurance program and standard operating procedures are consistent with the Project QAPP, and that laboratory analyses meet all applicable requirements or explain any deviations. The Project Chemist will also be responsible for coordinating with the Data Manager and Project Manager as required for the project. All laboratory analyses will be performed by the East Bay Municipal Utility District, Oakland, CA.

1.3.7 Other Collaborators (Bay Area Stormwater Management Agencies Association, SF Bay Regional Water Quality Control Board)

Bay Area Stormwater Management Agencies Association (BASMAA) and Water Board staff will be involved in the design and implementation of the Project. BASMAA and the Water

Board will coordinate their involvement through the Project Manager, and will be given the opportunity to review and comment on all relevant project documents, including, but not limited to, the project QAPP, SAP, and draft and final reports. BASMAA will serve as liaison between the municipalities and the Project Manager by providing summary information about the project and its objectives to the municipalities that may wish to participate in the project. BASMAA will also attempt to identify structures that meet the structure criteria within each municipality that may be available for testing and/or sampling and will attempt to secure permission from structure owners for testing or sampling.

2. Information Sources

2.1 Prior Investigations of PCBs in Sealants

A technical memorandum prepared for the Project summarized the available information on the use of PCBs in building materials (Moran et al. 2007). Based on information from these assessments, the memorandum made a number of recommendations for the Project, including the following:

- The project should focus on (1) caulking and sealants and (2) paints and coatings, with the caulking and sealants being the higher priority building material of the two.
- A combination of field screening with XRF and confirmation sampling with PCB measurements by an analytical laboratory (using gas chromatography-mass spectrometry or GC-MS) should be used in the investigation of PCB content in the building materials.
- The Project should initially focus its efforts on exterior caulking and sealants used in concrete and masonry structures constructed or substantially remodeled between 1957 and 1977. Testing and sampling should be designed to confirm and narrow the construction date range to ensure that the BMPs developed at a later stage in the Project target the appropriate structure types.

2.2 Use of portable X-Ray Fluorescence (XRF) to Estimate PCB Concentrations in Sealants

A pilot study was conducted in 2009 to determine if a portable XRF analyzer, which estimates the elemental composition of a substance (e.g. chlorine or Cl, not PCBs specifically) can be used as a screening tool to estimate PCB concentrations in sealants. In this study, 20 sealant samples were obtained from buildings predicted to have measurable concentrations of PCBs and analyzed for Cl content using XRF and a suite of PCB congeners using gas-chromatography-mass spectrometry (GC-MS). The results indicated that portable XRF may be most useful for ruling out sealants that do not contain high concentrations of PCBs (≥1%). When XRF did not detect Cl (detection limit average ~0.1%), PCBs were present at concentrations less than than ~0.1% in the sealants. However, in general, the pilot study results suggested that use of portable XRF alone is not a good indicator of PCB content due to a high rate of 'false positives'. That is, when XRF detected elevated Cl (~>0.1%), PCBs were present in only ~20% of the samples (i.e. 20% specificity), indicating the presence of other chlorinated compounds in the sealant samples. When PCBs were present, the relationship between XRF measured Cl and GC-MS measured

PCBs was sufficient such that an adjustment factor could be applied to the XRF Cl data to provide a good estimate of PCB content.

In February and March 2010, a preliminary field survey of ~25 Bay Area structures was conducted in which portable XRF was used to screen intact sealants for Cl content. Cl was detected in eight out of the ten structures surveyed that were thought to have been constructed during the time period when PCBs were commonly added to structural sealants; confirmation of construction dates and the status of sealant renovation was not readily available, however. Cl was also detected in at least one location on all three structures known to have been constructed in the 1990s and 2000s and in three out of five structures with unknown construction dates. These results suggest that chlorinated compounds are prevalent in sealants used in Bay Area building structures that were constructed not only during the time period of known PCB use, but also those constructed over the last thirty years, following the PCB ban in the late 1970s.

In addition to the potential high rate of 'false positives', 'false negatives' are also a concern with the use of portable XRF in this application. In the preliminary field survey conducted in 2010, method detection limits (MDLs) for Cl fluctuated between 728 and 12,795 ppm (0.07 to 1.3%), with a mean MDL of 4095 ppm (~0.4%). The cause of the MDL variability is unknown but is thought to be the result of interference with other elements present in the sample and/or matrix effects. In this context, 'false negatives' may occur when PCBs are present at a concentration below the elevated MDL for Cl (~1%) but above the average MDL (~0.4%). Use of a more sensitive portable XRF instrument would likely reduce the average MDL for Cl to 200 ppm, though it is uncertain at this time whether this instrument will be available for use in this Project.

3. Sample Types and Other Data Collection

3.1 Sampling Design

Preliminary information suggests that the primary use of XRF in this Project will be to rule out sealants that do not contain PCBs in concentrations ≥1% (see section 2.2). XRF may therefore be used to rule out structures from which samples will not be collected for analysis of PCBs by GC-MS.

Exterior sealants from a minimum of ten Bay Area structures will be tested for Cl using a portable XRF analyzer. The number of structures and sites selected is based on the requirement in section C.12.b in the Municipal Regional Stormwater NPDES Permit, which this project seeks to implement. Other members of the Project team, in collaboration with SFEI, will identify structures for testing using the criteria outlined in the technical memo (Moran et al. 2007) and secure permission to test them. If permission is granted, physical sealant samples will also be obtained from structures and sent to a qualified laboratory for PCB analysis according to the Project QAPP. Project budget constraints and the number of structures for which permission to sample is received determine the number of structures to be sampled during the Project.

Testing and sampling will focus on structures constructed between 1957 and 1977, the era when structures are most likely to contain PCB in their sealants (Moran et al. 2007) and, to the extent

feasible and supporting data are available, on sealants used on structure exteriors and those that have not been renovated or remodeled since construction. Structures may include, but are not limited to, transportation infrastructure (e.g. roads, bridges, sidewalks) and/or privately- or publicly-owned buildings. An estimate of the volume and surface area of the sealant on the exterior of each structure will also be determined to estimate the total mass of PCBs in the structure's sealants. This information, along with other site characteristics such as imperviousness, slope, and flow paths to the stormwater system, will be used to estimate potential PCB loadings from structural sealants to urban stormwater runoff.

3.2 Portable X-Ray Fluorescence (XRF) Data

A portable XRF analyzer will be used to estimate the concentration of Cl and other trace elements in sealants on each structure selected for inclusion in the Project. Sealants used around windows, at building/walkway interfaces, and in expansion joints between two abutting pieces of concrete will be targeted since sealants in these locations are most likely to contain PCBs (Moran et al. 2007). A preliminary validation study (section 2) indicated that XRF may be a useful screening tool for PCBs in sealants because it detected Cl when PCBs were present at percent levels in sealants and did not detect Cl when PCBs were less than than ~0.1%. XRF analysis can be conducted on either intact sealant or a sealant sample removed from the structure. However, analysis of a sample removed from the structure may be more reliable due to the difficulty of accessing intact sealants with the XRF (i.e. sealant location often prevents flush contact of XRF with the sealant) and the potential for analytical interference due to the presence of unknown materials behind the sealant (e.g. if the sealant thickness is less than the X-ray penetration depth, the presence of mortar or other material behind the sealant may affect the analysis); the extent to which these situations influence the analysis is unknown. In addition to Cl, other elemental data will be collected for possible determination of an elemental 'fingerprint' for PCBs using portable XRF. The pilot study conducted in 2009 (section 2.2) suggested, however, that the existence of a fingerprint is unlikely.

3.3 Sealants

If permission is granted, sealant samples for PCB analysis using GC-MS will be collected from one or more locations on the structure. Collection of one sealant sample per sealant type on each structure is desirable to fully characterize the PCB content in the structure's sealants. Sampling location(s) and procedures for replacement of the sealant will be conducted with concurrence from the municipality or structure owner. Alternatively, sealant samples may be obtained from structures via 'blind' sampling (i.e. not collected by SFEI). This may involve anonymously transmitting the sealant samples and the corresponding structure information (i.e. structure age and other characteristics but not geographical location) to SFEI.

Budget limitations may prevent the analysis of all sealant samples collected. If necessary, the Project team will select a sub-set of samples for PCB analysis using GC-MS once all samples have been collected.

3.4 QC Blanks (Field Blanks)

Collection of sealant field blank samples has been deemed unnecessary due to the difficulty in collection and interpretation of representative blank samples and the use of precautions that minimize contamination of the samples. Additionally, PCBs have been reported to be present in percent concentrations when used in sealants; therefore any low level contamination (at ppb or even ppm level) due to sampling equipment and procedures is not expected to affect data quality because it would be many orders of magnitude lower than the concentrations deemed to be a positive PCB signal.

3.5 QC Samples (Field Duplicates)

Assessment of within-structure variability of PCB concentrations in sealants is not a primary objective of the Project, therefore field duplicate samples will not be collected. Due to budget limitations, GC-MS analysis of only one sealant sample per sealant type on each structure will maximize the number of Bay Area structures and structure types that may be analyzed in the Project. The selected laboratory will conduct a number of quality assurance analyses (see Project QAPP), including a limited number of sample duplicates, to evaluate laboratory and method performance as well as variability of PCB content within a sample.

4. Field Documentation

Proper documentation of testing and sampling locations and methods is important to interpretation of project results. Data documentation at each location will include information recorded on field data sheets and photographic documentation. If permission is granted to collect physical samples of sealants, information will also be recorded on sample labels.

4.1 Field Data Sheets

A field data sheet will be completed for each structure tested ('Structure Information' form) and each sealant type screened on each structure ('Sealant Information' form; see forms in the Appendix). The 'Structure Information' form will include the type of structure (e.g. commercial building, school, etc.), County in which the structure is located, and the date of construction, if known. The 'Sealant Information' form will include the location/function of the sealant on the structure (e.g. around window or between concrete blocks), whether or not the sealant has been renovated since construction, physical characteristics of the sealant (i.e., level of deterioration, color), as well as all XRF tests for chlorine conducted on the sealant. If physical samples of sealant are collected, the sample ID and post-collection XRF chlorine tests will also be recorded on the 'Sealant Information' form. All information will be recorded in permanent ink. Any changes made to the recorded information will be made using single strike-through and will be initialed and dated by the person making the change.

4.2 Photographic Documentation

A photograph of each type of sealant tested or sampled on each structure will be taken. Photographs of the testing and sample collection process may also be taken. Care will be taken to

avoid capturing information in the photo that could be used to identify the structure location; only close-up photos that record the physical appearance/condition of the material and the material function (e.g. sealing cement blocks in a walkway or joining cement blocks in a building) are necessary. The photo number will be recorded on each corresponding testing or sample collection data sheet. All photographs will be stored on the SFEI file server for the project duration.

4.3 Sample Identification

Sealant samples will be assigned unique sample identification codes to provide a method for tracking each sample, and codes will be recorded on sample labels (Appendix). Each sample will be identified by a unique code that indicates the sampling date, structure ID, and sample number. The following is an example of the sample identification code for the samples:

100504-03-1

where: 100504 indicates the sampling date, May 4, 2010;
03 indicates structure #3, which will start at '1' and increase by one in chronological order of sampling;
1 indicates the sample number, which will start at '1' and increase by one consecutively with each sample collected on each structure.

5. Testing and Sampling Procedures

The following section describes the field testing and sampling techniques that will be used in the Project. Procedures for testing sealants using portable X-Ray fluorescence (XRF) and collecting sealant samples are not standardized and minimal detail on sealant sample collection is available in peer-reviewed publications. Sealant sampling procedures were therefore developed in consultation with the XRF company representative and researchers with experience using the XRF on sealants and plastics. Professional judgment was used to develop sealant sample collection methods.

5.1 Sealant Testing and Sampling Procedures

Once a structure has been identified as meeting the selection criteria and permission is granted to perform the testing or collection of sealant samples, an on-site survey of the structure will be used to identify sealants and sealant locations on the structure to be tested or sampled. It is expected that sealants from a number of different locations on each structure may be tested; however, inconspicuous locations on the structure will be targeted for any physical sealant sampling.

5.1.1 Sealant Testing Using Portable X-Ray Fluorescence (XRF)

A portable XRF analyzer (Innov-X Systems, Woburn, MA) will be used as a screening tool to estimate the concentration of chlorine (Cl) and other elements in sealants in many locations on each structure. The analyzer will also be calibrated for Cl using plastic pellet European reference materials (EC680 and EC681) upon first use. The XRF analyzer will be ‘standardized’ using

procedures recommended by the Innov-X representative each time the instrument is turned on and prior to any sealant monitoring. A 30 second measurement in soil/light element analytical program (LEAP) mode will be used. Field personnel will wipe the sealant surface to be sampled with a laboratory tissue to remove any debris that may potentially interfere with the XRF analysis. At least one XRF reading will be collected from each type of sealant present on the structure (e.g., window sealant, joint between concrete blocks, and joint between concrete at base of building and surrounding concrete surface). If Cl is detected, a minimum of two additional readings will be conducted at the same location on the structure to determine analytical variability and at other locations on the structure to determine variability in Cl concentration within sealant type on each structure. The XRF analyzer will record the estimated concentration of a variety of elements in the sealant and the Cl concentration will be recorded on field datasheets. XRF analysis will also be conducted on any sealant samples following their collection from the structure.

5.1.2 Sealant Sampling for Laboratory Analysis

Where permission is granted to collect sealant samples, selection of the appropriate samples to collect will be made at the time of sampling by the Project Manager in consultation with the structure owner. Following XRF analysis on the intact material, a one inch strip (or ~10 g) of the sealant sample will be removed from the structure using a utility knife with a solvent-rinsed, stainless-steel blade. Field personnel will wear Nitrile gloves during sample collection to prevent sample contamination. The sample will be placed on a clean surface, where it will undergo a second XRF analysis. The sample will then be placed in a labeled, laboratory-cleaned glass jar. The samples will be kept in a chilled cooler until returned to SFEI, where the samples will be refrigerated pending delivery under chain-of-custody (COC) to the analytical laboratory. The procedure for replacement of the sealant will be coordinated with each municipality or structure owner.

5.2 Decontamination Procedures

5.2.1 Initial Equipment Cleaning

The sampling equipment that is pre-cleaned includes:

- Glass sample jars
- Utility knife, extra blades
- Stainless-steel spatulas, forceps

Prior to sealant sampling, all equipment will be thoroughly cleaned. Glass sample containers will be factory pre-cleaned (Quality Certified™, ESS Vial, Oakland, CA) and delivered to SFEI at least one week prior to the start of sample collection. Sample containers will be pre-labeled and kept in their original boxes, which will be transported in coolers. Utility knife blades, spatulas, and forceps will be pre-cleaned with Alconox, Liquinox, or similar detergent, and then rinsed with deionized water and methanol. The cleaned equipment will then be wrapped in methanol-rinsed aluminum foil and stored in clean Ziploc bags until used in the field.

5.2.2 Field Cleaning Protocol

Between each use the utility knife blade, spatulas, and forceps will be rinsed with methanol and then deionized water, and inspected to ensure all visible sign of the previous sample have been removed. The clean utility knife, extra blades, spatulas, and forceps will be kept in methanol-rinsed aluminum foil and stored in clean Ziploc bags when not in use.

5.3 Collection of Samples for Archiving

Archive samples will not be collected for this project. The sample size collected will be enough to support additional analyses if QAQC issues arise. Once quality assurance is certified by the QA officer, the laboratory will be instructed to dispose of any leftover sample materials.

6. Sample Handling Procedures

The following protocols were developed to maximize the likelihood that collected samples are representative of the structural sealant's current condition.

6.1 Sample Containers

Where permission is granted, a minimum of one sealant sample will be collected at each structure location. The sealant sample will be transferred into appropriate factory pre-cleaned containers using pre-cleaned forceps.

6.2 Sample Preservation and Storage

At the conclusion of sample processing at each site, all sample containers will be placed in the original container shipping box in a chilled cooler. At the conclusion of each sampling day, all samples will be refrigerated until delivery to the analytical laboratory.

6.3 Sample Custody and Shipment

At appropriate intervals or following the conclusion of sample collection for the Project, samples will be hand-delivered to the analytical laboratory with itemized chain-of-custody (COC) forms. Sufficient sampling information will be recorded in the field that allows tracking sample shipments from field to laboratory and from laboratory through data processing. All samples will be delivered in accordance with laboratory procedures. The following instructions are the most stringent requirements associated with analytical laboratories used for the Regional Monitoring Program for Water Quality in San Francisco Estuary (RMP):

Personnel delivering the samples should ensure COCs (example in Appendix) are filled out completely and legibly and that:

- All samples in shipment are represented on the COC
- All samples on the COC are included in the shipment

- Information on the COC and sample container label (e.g., sample ID, collection date, collection time, analysis) are in agreement
- The COC lists the appropriate project ID and Data Manager
- The COCs are signed by the responsible party

Glass jars holding sealant samples will be transported in the factory provided box. Glass jars will be cushioned to avoid damaging the containers while in transit. The shipping personnel will notify the laboratory in advance of sample delivery. The Project Manager will follow up with the laboratory to verify the shipment was received.

6.4 Laboratory Chain of Custody Procedures

Sample custody transfers to the analytical laboratory at the time of receipt. Upon receipt of the samples, the laboratory sample custodian should first verify sample integrity. Verification should include:

- Presence of custody seal
- Samples at appropriate temperature
- Chain of custody forms in agreement with samples
- Sample containers intact
- Samples labeled appropriately

Any questions on shipments should be brought to the attention of the Project Manager for resolution. Custody procedures followed by the laboratory should then follow laboratory standard operating procedures.

7. Investigation Derived Waste

7.1 Sampling Residuals

Upon completion of the project, the analytical laboratory will dispose of sampling residuals containing ≥50 ppm PCBs following the procedures outlined by the Toxic Substances Control Act (TSCA) for bulk product waste. The disposal of PCB bulk product waste is regulated under 40 CFR § 761.62 of TSCA. Under this provision, PCB bulk product waste must be disposed of in one of two ways: disposal in a permitted solid waste landfill or via a risk-based disposal approval process.

7.2 Personal Protective Equipment

At the conclusion of sampling efforts, field sampling personnel will collect any protective equipment used in the sampling process for appropriate disposal.

7.3 Decontamination Waste

Waste water and methanol produced in the decontamination of the field equipment process will be collected and removed by sampling personnel for proper disposal. No waste water or methanol will be left on-site at the conclusion of sampling.

8. Quality Control for Field Operations

Field personnel will strictly adhere to the Project protocols to ensure the collection of representative, uncontaminated samples. The most important aspects of quality control associated with sample collection are as follows:

- Field personnel will be thoroughly trained in the proper use of sample collection equipment and will be able to distinguish acceptable versus unacceptable samples in accordance with pre-established criteria.
- Field personnel will be thoroughly trained to recognize and avoid potential sources of sample contamination (e.g., uncleaned knife).
- Containers and tools that come in direct contact with the sample will be made of non-contaminating materials (e.g., glass, stainless-steel) and will be thoroughly cleaned between samples.
- Sample containers will be pre-cleaned and of the recommended type
- Field personnel will wear Nitrile gloves and safety eyeglasses when collecting physical sealant samples and cleaning sample collection equipment.

9. Laboratory Analysis

9.1 Laboratory Analytical Methods

Though every effort will be made to collect only those samples which will be analyzed for PCBs, a potential outcome of the project is that, due to budget constraints, not all of the samples collected will be analyzed by the laboratory. The number and types of structures that will be available for collection of sealant samples are not currently known and it is anticipated that not all of the municipalities and/or structure owners may have the opportunity to respond to the request for permission to collect samples prior to the initiation of field sampling. Sampling may therefore occur on an opportunistic basis, potentially resulting in a number of samples that cannot be analyzed for PCBs due to budget constraints (i.e. ‘oversampling’). Samples that represent sealants from a variety of structure types and construction years will be selected for PCB analysis, consistent with project goals.

The samples will be analyzed for PCBs using a modified EPA 8270 protocol (semi-volatile organic compounds by gas chromatography-mass spectrometry). Hold times will follow EPA method 1668 (i.e. one year to extract and one year for extracts if samples and extracts are stored at -10 °C). Samples will be stored in 60 ml or 125 ml wide mouth glass jars until analysis. The minimum sample size is 10 g dry weight. PCB analytical results will be reported as IUPAC congeners. The congener list will include:

- the 40 congeners routinely monitored by the RMP (PCBs 8, 18, 28, 31, 33, 44, 49, 52, 56, 60, 66, 70, 74, 87, 95, 97, 99, 101, l05, 110, 118, 128, 132, 138, 141, 149, l51, 153, 156, 158, 170, 174, 177, 180, 183, 187, 194, 195, 201, and 203),
- PCB 11, a non-Aroclor congener commonly detected in wastewater effluent and environmental samples (Rodenburg et al. 2010),
- the coplanar PCBs 77, 126, and 169, 'dioxin-like' congeners which contribute substantially to the dioxin toxic equivalents observed in San Francisco Bay sport fish.

9.2 Sample Tracking

Sufficient sampling information must be recorded in the field that allows tracking sample shipments from field to laboratory and from laboratory through data processing.

9.3 Data Reporting Requirements

As previously indicated, laboratory personnel will verify that the measurement process was "in control" (i.e., all specified data quality criteria were met or acceptable deviations explained) for each batch of samples before proceeding with the analysis of a subsequent batch. In addition, the laboratory will establish a system for detecting and reducing transcription and/or calculation errors prior to reporting data. Only data that have met data quality criteria, or data that have acceptable deviations explained, will be submitted by the laboratory. When QA requirements have not been met, the samples will be re-analyzed when possible. Only the results of the re-analysis will be submitted, provided they are acceptable.

10. Refinements to the Planned Monitoring

Additional details regarding the planned monitoring will be developed in the future when further information becomes available on realistic sampling sites and scenarios. This will include estimating the numbers of samples anticipated to be sent to a laboratory for PCB analysis during both the characterization and implementation trial phases of the project and associated budget projections (e.g., numbers of samples and associated costs).

The overall objective of the monitoring is to obtain Bay Area-specific information on the presence of PCBs in sealants used in historic buildings and other structures and thereby inform development and testing of BMPs to properly identify, handle and dispose of these materials during renovation and demolition projects. Ancillary objectives may be articulated as further information becomes available, such as developing a relationship between XRF field screening and laboratory analysis results.

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12. Appendix

Examples of field documentation associated with the Structural PCBs Project. Examples of the following are shown:

- Structure Information form
- Sealant Information form
- Chain of Custody (COC) form

Structural PCBs Project — Structure Information Form

Structure ID# _____

Sampling Date _____

Year of construction (Estimate if date cannot be provided: pre-1950, 1950-59; 1960-69; 1970-79; post-1979)_____

Construction type:

- ☐ Light wood-frame residential and commercial building smaller than or equal to 5,000 square feet (W1)
- ☐ Light wood-frame building larger than 5,000 square feet (W2)
- ☐ Steel moment-resisting frame building (S1)
- ☐ Braced steel frame building (S2)
- ☐ Light metal building (S3)
- ☐ Steel frame building with cast-in-place concrete shear walls (S4)
- ☐ Steel frame building with unreinforced masonry infill walls (S5)
- ☐ Concrete moment-resisting frame building (C1)
- ☐ Concrete shear-wall building (C2)
- ☐ Concrete frame building with unreinforced masonry infill walls (C3)
- ☐ Tilt-up building (PC1)
- ☐ Precast concrete frame building (PC2)
- ☐ Reinforced masonry building with flexible floor and roof diaphragms (RM1)
- ☐ Reinforced masonry building with rigid floor and roof diaphragms (RM2)
- ☐ Unreinforced masonry bearing-wall building (URM)
- ☐ Other _____

Total # of sealant types/locations screened on the structure _____

Total # of sealant samples collected from structure _____

Notes:_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

Structural PCBs Project — Sealant Information Form

Structure ID# _____

Sampling Date _____

Sealant function/location on structure:

____ Around window

____ Around doorway

____ Between concrete blocks and base of structure

____ Between concrete blocks on structure wall

____ Other _____

Has the sealant been replaced since the structure construction date?

____Yes ____ No ____ Unknown If yes, what year? _____

What is the physical condition of the sealant?

____ Good (not cracked or deteriorating)

____ Fair (some cracking/deterioration)

____ Poor (very deteriorated, noticeably falling apart)

What color is the sealant?

White ____ Light grey ____ Dark grey _____ Black _____ Brown _____

Other, please specify _____

XRF tests on intact sealant

% Cl _____ XRF ID# _____ Photo#_____

% Cl _____ XRF ID# _____ Photo#_____

% Cl _____ XRF ID# _____ Photo#_____

Sealant volume estimate on the structure

Height of sealant strip _____

Number of stories on the structure (i.e., structure height) _____

Approximate dimensions of structure (i.e. length, width) _____

If applicable, number of doors and/or windows on the structure _____

Was a physical sealant sample collected from this location on the structure?

Yes ____ No ____

Sealant sample ID# _____

XRF tests on sealant (post collection from structure)

% Cl _____ XRF ID# _____ Photo#_____

% Cl _____ XRF ID# _____ Photo#_____

% Cl _____ XRF ID# _____ Photo#_____

<<Where sealant sample collections are possible, there will be a 'Sealant Information' form completed for each type of sealant on the structure, in addition to the 'Structure Information' form.>>

Results to:

CHAIN OF CUSTODY RECORD

Page of

San Francisco Estuary Institute
7770 Pardee Lane
Oakland, CA, 94621-1424
Phone: 510-746-7334 Fax: 510-746-7300

Bill to:

Shipped to:

Sampled by [Print Name(s)] / Affiliation

Sampler(s) Signature(s)

Preservatives (see codes)

Analyses Requested

Project Name:

Sample ID No.	Sampled Date	Sampled Time	Grab or Composite	Matrix (see codes)	Number/Size/Type of Containers										Remarks

Shipment Method

Out: / /

Via:

← Total Number of Containers

Relinquished by / Affiliation	Date	Time	Accepted by / Affiliation	Date	Time

Additional Comments:

Cooler No.(s) / Temperature(s) (C)°

MATRIX CODES: F = Freshwater S = Saline SE = Sediment SW = Surface Water PW = Porewater B = Blanks T= Toxicity O = Other (specify)

PRESERVATIVE CODES: H = Hydrochloric acid + ice I = Ice only N = Nitric acid + ice S = Sulfuric acid + ice O = Other (specify)

A10

Quality Assurance Project Plan for the PCBs in Caulk Project (Taking Action for Clean Water Bay Area TMDL Implementation)

Subcontract for SWRCB Agreement No. 09-305-550-1 with
Association of Bay Area Governments

Prepared by
Susan Klosterhaus
San Francisco Estuary Institute

July 2010

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Quality Assurance Project Plan for the PCBs in Caulk Project (Taking Action for Clean Water Bay Area TMDL Implementation)

Subcontract for SWRCB Agreement No. 09-305-550-1 with
Association of Bay Area Governments

Approvals*:

Bill Ray, QA Officer, State Water Resources Control Board

Signature: _____Date:_____

San Francisco Estuary Partnership

Signature: _____Date:_____

San Francisco Estuary Institute

Signature: _____Date:_____

*Signature implies that the signatory has reviewed the document, has no exceptions to its content, and agrees with the description of their agency's role in the project

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1. Project Management

1.1. Project Background

Elevated polychlorinated biphenyl (PCB) levels threaten the heath of people and wildlife consuming fish from San Francisco Bay (RWQCB, 2008). A Total Maximum Daily Load (TMDL) to address PCB impairment of all segments of San Francisco Bay was adopted by the San Francisco Bay Regional Water Quality Control Board in February 2008. The San Francisco Bay PCBs TMDL Project Report (RWQCB 2004) found that urban runoff was one of the major sources of PCB loads to the Bay and concluded that controlling sources of PCBs to urban runoff was one of two top priorities for TMDL implementation. Based on this recommendation, the Clean Estuary Partnership (CEP) evaluated available data on sources of PCBs in urban runoff and recommended approaches for addressing two potentially significant sources, past PCBs releases that have contaminated soil and sediments and PCB-containing historic building materials, specifically uncontained materials like sealants, caulking and paint (LWA et al. 2006). When the building materials fail or buildings are remodeled, residues can be transported away from the building during rainstorms, through landscape irrigation overflows, or by pavement washing (forecourts and footpaths surrounding the buildings) and find their way into the stormwater drainage system. In addition, when buildings are demolished, PCBs may be released onto the ground and can be washed off into stormwater drains by rainfall. While these are logical pathways, we lack data to determine which buildings have PCBs at levels that may be concerning, the magnitude of losses to stormwater, or how PCBs in buildings could be better managed.

A survey of 1,348 buildings in Switzerland constructed between 1950 and 1980 found that almost half of the buildings contained PCBs, almost 10% of the buildings contained sealants with PCB concentrations exceeding 10% by weight, and the total PCBs reservoir in Switzerland was an estimated 50-150 metric tons (Kohler et al. 2005). Less rigorous studies have been conducted in Boston (Herrick et al. 2004) and Toronto (Melymuk et al. 2008) with similar findings; however no such evaluation is known for California. A Swedish study also found that significant quantities of PCBs were released into soil and water runoff during building remodeling (Astebro et al. 2000). Both the Swiss and Swedish governments have developed active programs to manage PCB-containing building materials in response to public health concerns, which relate to both direct exposures and the adverse effect of PCBs on Europe's fisheries.

In 2007 the California State Water Resources Control Board awarded the Association of Bay Area Governments (ABAG) a grant that includes several tasks for implementation of Bay Area Total Maximum Daily Loads (TMDLs). The project was halted under the state bond freeze in December 2008 and restarted under the American Recovery and Reinvestment Act of 2009 (ARRA) through the State Revolving Fund in August of 2009. One of the tasks in the master grant is the PCBs in Caulk Project (referred to herein as the Project), which includes characterizing the use of PCBs in historic building materials in the San Francisco Bay Area. The San Francisco Estuary Institute (SFEI) is the subcontractor for Task 7.5.2.2 of SWRCB Agreement No. 09-305-550-01.

1.2. Project Description

The objective of this element of the PCBs in Caulk Project is to obtain Bay Area-specific estimates on PCB loadings to urban runoff from historic building materials. While many structures were historically built with a variety of materials known to contain PCBs, including caulking/sealants, grouts, paints, and flame retardant coatings of acoustic ceiling tiles, the focus of this Project is caulking/sealants that were used between rigid components of buildings and other structures. The results from implementing this SAP will inform the development of BMPs for the handling of PCB-contaminated caulking. This SAP contains information on the data-collection phase of the Project, which will obtain Bay Area-specific information on the presence of PCBs in sealants used in historic buildings and other structures.

In collaboration with Bay Area Stormwater Management Agencies Association (BASMAA), the San Francisco Bay Regional Water Quality Control Board (Water Board), and local municipalities, the San Francisco Estuary Institute (SFEI) will test or sample structures that have the potential to contain PCBs in their exterior sealants or caulking (herein referred to as only 'sealants'). Other members of the Project team will identify buildings and secure permission to test a minimum of ten Bay Area structures. Structures to be tested or sampled will be identified based on structure type, year of construction, and whether or not the sealants have been replaced or renovated since the original date of construction. Based on the results of this identification process, and in cooperation with structure owners, this SAP will be implemented to obtain Bay Area-specific information on the PCB content of sealants. As appropriate, data generated from the sampling phase will be used to support BMP development and implementation. All testing and sampling conducted during the above-mentioned activities will be in compliance with this SAP.

It is likely that sealant testing in participating buildings or structures will occur through the use of a portable X-ray fluorescence (XRF) detector to estimate PCB concentrations. If permission is granted, physical sealant samples will be collected from structures and sent to a qualified analytical laboratory for confirmation of PCB content according to the this Quality Assurance Project Plan (QAPP).

1.3. Quality Assurance Project Plan Description (QAPP)

This QAPP outlines procedures to be followed by project personnel to insure usability and representativeness of data collected through the Project implementation. The QAPP will be submitted to the State Water Resources Control Board (SWRCB) as part of the work to complete Task 7.5.2.2 of the master agreement, and under Task 1 of SFEI's subcontract under that agreement, which has a term of January 27, 2010 through December 1, 2011.

This QAPP is based largely on the QAPP produced for the Regional Monitoring Program for Water Quality in the San Francisco Estuary (RMP; Lowe et al. 1999) and the State of California Surface Water Ambient Monitoring Program (SWAMP; Puckett 2002). Though samples collected and analyzed in the Project are very different from those collected by the RMP, the field sampling control and laboratory control procedures contained within this QAPP were

developed to be consistent with those of the RMP to ensure consistency with datasets of potential comparative value, mainly the RMP and other SFEI datasets and the datasets developed by other Bay Area programs collected in conformance with Water Board data requests.

Making environmental management decisions in a scientifically defensible way depends on the sensitivity of the measurement system and the levels of confidence and certainty in the data. The purpose of this document is to maximize the probability that environmental data collected through the Project will meet the expectations of the data users. The Data Quality Objectives (DQOs) presented in this QAPP are intended to maximize the probability that the data actually represent conditions in the environment while minimizing artifacts due to sample collection and processing.

1.4. Project Organization and Responsibilities

The project will make use of the cooperative efforts of several parties involved in the design and implementation of the various components of the project. The main roles and responsibilities are defined below.

1.4.1 SWRCB Project Manager (Kari Holmes, California State Water Resources Control Board)

The SWRCB Project Manager oversees performance of the project agreement and monitors progress of the project. Technical review will be delegated to Jan O'Hara at the San Francisco Bay Regional Water Quality Control Board.

1.4.2 Project Manager (Athena Honore, ABAG/SFEP)

The Project Manager will be responsible for ensuring that all work performed through the Project is consistent with the project proposal and objectives, and for oversight of all efforts associated with the project. Additionally, the Project Manager will act as the liaison between the Contractor and the SWRCB Project Manager.

1.4.3 Contractor (SFEI)

The Contractor will be responsible for all efforts associated with the data collection phase, including SAP and QAPP development, data and sample collection, data management and interpretation, and reporting. The Contractor is also responsible for oversight of the subcontractor performing the laboratory analysis.

1.4.4 Contractor Project Manager (Susan Klosterhaus, SFEI)

The Contractor Project Manager will be responsible for ensuring that testing and sampling personnel adhere to the provisions of the QAPP and SAP. The Contractor Project Manager is also responsible for custody of any samples collected until receipt by the analytical laboratory.

1.4.5 Data Manager (Don Yee or Jay Davis, SFEI)

The Data Manager will be responsible for receipt and review of all project related documentation and reporting associated with laboratory PCB analysis. The Data Manager will serve as the project quality assurance officer and will be responsible for verifying compliance of all analytical data with the requirements established by the Project QAPP before its use for interpretive purposes.

1.4.6 Project Chemist (Francois Rodigari, East Bay Municipal Utility District)

The Project Chemist at the selected analytical laboratory will be responsible for ensuring that the laboratory's quality assurance program and standard operating procedures are consistent with the Project QAPP, and that laboratory analyses meet all applicable requirements or explain any deviations. The Project Chemist will also be responsible for coordinating with the Data Manager and Project Manager as required for the project. All laboratory analyses will be performed by the East Bay Municipal Utility District, Oakland, CA.

1.4.7 Other Collaborators (Bay Area Stormwater Management Agencies Association, SF Bay Regional Water Quality Control Board)

Bay Area Stormwater Management Agencies Association (BASMAA) and Water Board staff will be involved in the design and implementation of the Project. BASMAA and the Water Board will coordinate their involvement through the Project Manager, and will be given the opportunity to review and comment on all relevant project documents, including, but not limited to, the project QAPP, SAP, and draft and final reports. BASMAA will serve as liaison between the municipalities and the Project Manager by providing summary information about the project and its objectives to the municipalities that may wish to participate in the project. BASMAA will also attempt to identify structures that meet the structure criteria within each municipality that may be available for testing and/or sampling and will attempt to secure permission from structure owners for testing or sampling.

1.5 Documentation and Records

All appropriate project-related materials (e.g., field notes, reports, photographs, laboratory reports, etc.) will be delivered to and maintained by the Contractor Project Manager or the Data Manager for the project duration. A discussion of some of the key parts of the documentation process is shown below.

1.5.1 Laboratory Data Reduction and Review

The laboratory analyst who performs the analysis is responsible for reviewing the initial dataset for accuracy and acceptability. Where calculations are not performed by a validated software system, a second reviewer should verify a minimum of 10% of the calculations. The Project Chemist should also check the data report for completeness and errors prior to submission to the Data Manager.

The analytical laboratory will report the analytical data via an analytical report consisting of, at a minimum:

- letter of transmittal
- analytical results in SWAMP format
- quality control results
- chain of custody information
- case narrative
- copies of all raw data

In addition to the printouts supplied by the analytical laboratory, test results should also be delivered to the Data Manager in MS Excel compatible electronic format.

1.5.2 Procedures to Verify Data Integrity

The integrity of the data generated in the laboratory is assessed through the evaluation of the results of the analysis of various quality control (QC) samples by the Data Manager. The numerical criteria for evaluation of these QC samples is specific to the analysis being performed and shall be consistent with laboratory Standard Operating Procedures (SOPs).

1.5.3 Treatment of Outliers

Only data that have met data quality criteria, or data that have acceptable deviations explained, will be submitted by the Project Chemist to the Data Manager. When QA requirements have not been met, the samples will be reanalyzed when possible. Only the results of the reanalysis will be submitted, provided they are acceptable.

1.5.4 Data Management

The Data Manager will review the data deliverables provided by the Project Chemist for completeness and errors. Data will be validated according to this QAPP to ensure that Data Quality Objectives (DQOs) are met. Data will be delivered to the Data Manager or Contractor Project Manager in SWAMP format.

2. Field Sampling

2.1 Sampling Design

Exterior sealants from a minimum of ten Bay Area structures will be tested for Cl using a portable XRF analyzer. The number of structures and sites selected is based on the requirement

in section C.12.b in the Municipal Regional Stormwater NPDES Permit, which this project seeks to implement. Other members of the Project team, in collaboration with SFEI, will identify structures for testing using the criteria outlined in the technical memo (Moran et al. 2007) and secure permission to test them. If permission is granted, physical sealant samples will also be obtained from structures and sent to a qualified laboratory for PCB analysis according to this QAPP. Project budget constraints and the number of structures for which permission to sample is received determine the number of structures to be sampled during the Project.

Testing and sampling will focus on structures constructed between 1957 and 1977, the era when structures are most likely to contain PCB in their sealants (Moran et al. 2007) and, to the extent feasible and supporting data are available, on sealants used on structure exteriors and those that have not been renovated or remodeled since construction. Structures may include, but are not limited to, transportation infrastructure (e.g. roads, bridges, sidewalks) and/or privately- or publicly-owned buildings. An estimate of the volume and surface area of the sealant on the exterior of each structure will also be determined to estimate the total mass of PCBs in the structure's sealants. This information, along with other site characteristics such as imperviousness, slope, and flow paths to the stormwater system, will be used to estimate potential PCB loadings from structural sealants to urban stormwater runoff. Additional information on the sampling design can be found in the 'Field Sampling and Analysis Plan' for the Project.

2.2 Sampling Procedures

Once a structure has been identified as meeting the selection criteria and permission is granted to perform the testing or collection of sealant samples, an on-site survey of the structure will be used to identify sealants and sealant locations on the structure to be tested or sampled. It is expected that sealants from a number of different locations on each structure may be tested; however, inconspicuous locations on the structure will be targeted for any physical sealant sampling.

2.2.1 Sealant Testing Using Portable X-Ray Fluorescence (XRF)

A portable XRF analyzer (Innov-X Systems, Woburn, MA) will be used as a screening tool to estimate the concentration of chlorine (Cl) and other elements in sealants in many locations on each structure. The analyzer will also be calibrated for Cl using plastic pellet European reference materials (EC680 and EC681) upon first use. The XRF analyzer will be 'standardized' using procedures recommended by the Innov-X representative each time the instrument is turned on and prior to any sealant monitoring. A 30 second measurement in soil/light element analytical program (LEAP) mode will be used. Field personnel will wipe the sealant surface to be sampled with a laboratory tissue to remove any debris that may potentially interfere with the XRF analysis. At least one XRF reading will be collected from each type of sealant present on the structure (e.g., window sealant, joint between concrete blocks, and joint between concrete at base of building and surrounding concrete surface). If Cl is detected, a minimum of two additional readings will be conducted at the same location on the structure to determine analytical variability and at other locations on the structure to determine variability in Cl concentration within sealant type on each structure. The XRF analyzer will record the estimated concentration

of a variety of elements in the sealant and the Cl concentration will be recorded on field datasheets. XRF analysis will also be conducted on any sealant samples following their collection from the structure.

2.2.2 Sealant Sampling for Laboratory Analysis

Where permission is granted to collect sealant samples, selection of the appropriate samples to collect will be made at the time of sampling by the Project Manager in consultation with the structure owner. Following XRF analysis on the intact material, a one inch strip (or ~10 g) of the sealant sample will be removed from the structure using a utility knife with a solvent-rinsed, stainless-steel blade. Field personnel will wear Nitrile gloves during sample collection to prevent sample contamination. The sample will be placed on a clean surface, where it will undergo a second XRF analysis. The sample will then be placed in a labeled, laboratory-cleaned glass jar. The samples will be kept in a chilled cooler until returned to SFEI, where the samples will be refrigerated pending delivery under chain-of-custody (COC) to the analytical laboratory. The procedure for replacement of the sealant will be coordinated with each municipality or structure owner.

2.3 Sample Handling and Custody Procedures

Sufficient sampling information must be recorded in the field that allows tracking sample shipments from field to laboratory and from laboratory through data processing and quality assurance. Custody for samples remains with the sampling personnel until time of receipt by the analytical laboratory. Samples will be kept under refrigeration (4 degrees Celsius) until delivery to the laboratory. Samples will be transported to the laboratory in a chilled cooler.

2.4 Field Performance Measurements

Following is a list of field performance measurements that are typically included in sampling protocols.

2.4.1 Field Duplicates

The analysis of field duplicate samples would evaluate within-structure variability of PCB concentrations in sealants, which has not been previously documented. Sealant PCB concentrations have the potential to vary spatially within each structure due to variability in the volume of Aroclor mixture(s) and the type of Aroclor mixture(s) added in each batch of sealant prepared on site during construction.

Assessment of within-structure variability of PCB concentrations in sealants is not a primary objective of the Project, therefore field duplicate samples will not be collected. Due to budget limitations, GC-MS analysis of only one sealant sample per sealant type on each structure will maximize the number of Bay Area structures and structure types that may be analyzed in the Project.

2.4.2 Field Blanks

Collection of sealant field blank samples has been deemed unnecessary due to the difficulty in collection and interpretation of representative blank samples and the use of precautions that minimize contamination of the samples. Additionally, PCBs have been reported to be present in percent concentrations when used in sealants; therefore any low level contamination (at ppb or even ppm level) due to sampling equipment and procedures is not expected to affect data quality because it would be many orders of magnitude lower than the concentrations deemed to be a positive PCB signal.

3. Analytical Methods

3.1 Laboratory Analytical Methods

The samples will be analyzed for PCBs using a modified EPA 8270 protocol (semi-volatile organic compounds by gas chromatography-mass spectrometry). The full analytical method is attached in the Appendix. Hold times will follow EPA method 1668 (i.e. one year to extract and one year for extracts if samples and extracts are stored at -10 °C). Sealant samples will be stored in refrigerators at 4°C in wide mouth glass jars (30, 60, or 125 ml) until analysis. The minimum sample size is 10 g dry weight. PCB analytical results will be reported as IUPAC congeners. The congener list will include:

- the 40 congeners routinely monitored by the RMP (PCBs 8, 18, 28, 31, 33, 44, 49, 52, 56, 60, 66, 70, 74, 87, 95, 97, 99, 101, l05, 110, 118, 128, 132, 138, 141, 149, l51, 153, 156, 158, 170, 174, 177, 180, 183, 187, 194, 195, 201, and 203),
- PCB 11, a non-Aroclor congener commonly detected in wastewater effluent and environmental samples (Rodenburg et al. 2010),
- the coplanar PCBs 77, 126, and 169, 'dioxin-like' congeners which contribute substantially to the dioxin toxic equivalents observed in San Francisco Bay sport fish.

A summary of sampling and analysis specifics are shown in Table 1.

Table 1. Analytical Methods, Hold Times, and Miscellaneous Sampling Information

Matrix	Analyte	Extraction Method	Extraction Hold Time	Analytical Method	Hold Time (after extraction)	Container Type	Min. Sample Weight
Solid	PCBs	EPA 8270	365 days	Modified EPA 8270D	365 days	Glass jar	10 g dry weight

3.2 Data Quality Objectives

Data Quality Objectives (DQOs) and their associated data quality indicators (DQIs, e.g. method blank and matrix spike) for the Project are listed in Table 3 ('Batch QC Requirements) of the Appendix. Information on certified reference materials (CRMs) and the analysis of laboratory

replicate samples is not included in Table 3. A CRM for PCBs in sealants does not exist, therefore a CRM will not be analyzed. Regarding laboratory replicates, a minimum of one per batch of 20 or fewer samples will be analyzed in duplicate and the target performance criteria for these is a relative percent difference (RPD) of <35%. If duplicate samples have a RPD >35%, selected samples may be re-analyzed to investigate variability in PCB concentrations within a sample.

3.3 Analytical and Statistical Control Parameters

3.3.1 Analytical Batches

Samples will be processed in analytical batches, not to exceed twenty samples per any one batch. Laboratory personnel will review the results for the various QA/QC samples immediately following the analysis of each sample batch. These results will then be used to determine when data quality criteria have not been met, and corrective actions will be taken before processing a subsequent sample batch. When data quality criteria are not met, specific corrective actions are required before the analyses may proceed.

3.3.2 Accuracy

Accuracy describes how closely the reported analytical concentration relates to its true environmental value. The "absolute" accuracy of an analytical method can be assessed using Certified Reference Materials (CRMs)[1] only when certified values are available for the analytes of interest. Nevertheless, the concentrations of many analytes of interest may be provided only as non-certified values in some of the more commonly used CRMs. A laboratory fortified sample matrix (commonly called a matrix spike, or MS) and a laboratory fortified sample matrix duplicate (commonly called a matrix spike duplicate, or MSD) will be used both to evaluate the effect of the sample matrix on the recovery of the compound(s) of interest. Therefore, control limit criteria are based on "relative accuracy," which is evaluated for each analysis of the CRM or Matrix Spike by comparison of a given laboratory's values to the "true" or "accepted" and the expected values. In the case of CRMs, this includes both certified and noncertified values. The "true" values are defined as the 95% confidence intervals of the mean.

3.3.3 Precision

The precision of data is a measure of the reproducibility of an analytical measurement when an analysis is repeated. It is reported in Relative Percent Difference (RPD) or Relative Standard Deviation (RSD). Laboratory replicate samples and MS/MSD samples will be run according to the frequency outlined in Table 3 of the Appendix. The Relative Percent Difference (RPD) will be calculated as a measure of precision.

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[1] Certified reference materials (CRMs) are samples in which chemical concentrations have been determined accurately using a variety of technically valid procedures; these samples are accompanied by a certificate or other documentation issued by a certifying body (e.g., agencies such as the National Research Council Canada (NRCC), US EPA, US Geological Survey, etc.). Standard Reference Materials (SRMs) are CRMs issued by the National Institute of Standards and Technology (NIST), formerly the National Bureau of Standards (NBS).

3.3.4 Sensitivity of the Analytical Method

The method detection limit (MDL) is the ability of a method to distinguish between the analytical noise and the measurement signal and can be used to define the analytical limit of detectability. The MDL represents a quantitative estimate of low-level response detected at the maximum sensitivity of a method.

3.3.5 Completeness

Completeness is defined as "a measure of the amount of data collected from a measurement process compared to the amount that was expected to be obtained under the conditions of measurement" (Stanley and Verner, 1985). Ideally, 100% of the data would be available for interpretation. However, the possibility of data becoming unavailable, for example, due to laboratory error, insufficient sample volume, or samples broken in shipping must be expected. For this project, the target for completeness is 95%.

3.3.6 Representativeness

The representativeness of data is the ability of the sampling locations and the sampling procedures to adequately represent the true condition of the sample sites. Field personnel will strictly adhere to the field sampling protocols to ensure the collection of representative, uncontaminated samples. The most important aspects of quality control associated with chemistry sample collection are as follows:

- Field personnel will be thoroughly trained in the proper use of sample collection equipment and will be able to distinguish acceptable versus unacceptable samples in accordance with pre-established criteria.
- Field personnel will be thoroughly trained to recognize and avoid potential sources of sample contamination (e.g., dirty hands, insufficient field cleaning).
- Samplers and utensils that come in direct contact with the sample will be made of non-contaminating materials (e.g., glass, stainless steel, and/or inert chemical coatings) and will be thoroughly cleaned between sampling stations.
- Sample containers will be pre-cleaned and of the recommended type.

3.3.7 Comparability

Comparability is the degree to which data can be compared directly to other relevant studies. For this investigation, sampling and analytical methods were designed to be comparable to those employed in other studies of PCBs in sealants (references listed in section 1.1 of the 'Field Sampling and Chemical Analysis Plan' for this Project).

4. Laboratory Quality Assurance and Control

4.1 Laboratory Requirements

The analytical laboratory for the Project has the appropriate facilities to store, prepare, and process samples. Moreover, appropriate instrumentation and staff to provide data of the required quality within the project schedule are also required. Laboratory operations must include the following procedures:

- A program of scheduled maintenance of analytical balances, laboratory equipment, and instrumentation.
- Routine checking of analytical balances using a set of standard reference weights (American Society of Testing and Materials (ASTM) Class 3, NIST Class S-1, or equivalents).
- Checking and recording the composition of fresh calibration standards against the previous lot, wherever possible. Acceptable comparisons are < 2% of the previous value.
- Recording all analytical data in bound (where possible) logbooks, with all entries in ink, or electronic format.
- Monitoring and documenting the temperatures of cold storage areas and freezer units once per week.
- Verifying the efficiency of fume hoods.
- Having a source of reagent water meeting ASTM Type I specifications available in sufficient quantity to support analytical operations. The conductivity of the reagent water will not exceed 18 megaohms at 25°C. Alternately, the resistivity of the reagent water will exceed 10 mmhos/cm.
- Labeling all containers used in the laboratory with date prepared, contents, initials of the individual who prepared the contents, and other information, as appropriate.
- Dating and safely storing all chemicals upon receipt. Proper disposal of chemicals when the expiration date has passed.
- Having QAPP, SOPs, analytical methods manuals, and safety plans readily available to staff.
- Having raw analytical data, such as chromatograms, accessible so that they are available upon request. Laboratories will be able to provide information documenting their ability to conduct the analyses with the required level of data quality. Such information might include results from interlaboratory comparison studies, control charts and summary data of internal QA/QC checks, and results from certified reference material analyses. That laboratory should maintain all project related data for a minimum of five years.

4.2 Laboratory Personnel, Training, and Safety

Each laboratory providing analytical support for this project must have a designated on-site QC Officer for the particular analytical component(s) performed at that laboratory. This individual will serve as the point of contact for project staff in identifying and resolving issues related to data quality.

Personnel in any laboratory performing analyses for the project will be well versed in good laboratory practices, including standard safety procedures. It is the responsibility of the particular analytical component project officer, laboratory manager, and/or supervisor to ensure that safety training is mandatory for all laboratory personnel. Each laboratory is responsible for maintaining a current safety manual in compliance with the Occupational Safety and Health Administration (OSHA), or equivalent state or local regulations. The safety manual will be readily available to laboratory personnel. Proper procedures for safe storage, handling, and disposal of chemicals will be followed at all times; each chemical will be treated as a potential health hazard and good laboratory practices will be implemented accordingly.

4.3 Quality Assurance Documentation

The chemical laboratory will be provided with the Project QAPP. In addition, the following documents and information will be current, and will be available to all laboratory personnel participating in the processing of samples:

- Laboratory QA Plan: Clearly defined policies and protocols specific to a particular laboratory, including personnel responsibilities, laboratory acceptance criteria and corrective actions to be applied to the affected analytical batches, qualification of data, and procedures for determining the acceptability of results.
- Laboratory Standard Operating Procedures (SOPs): Containing instructions for performing routine laboratory procedures.
- Laboratory Analytical Methods Manual: Step-by-step instructions describing exactly how a method is implemented in the laboratory for a particular analytical procedure.
- Instrument Performance Information: Information on instrument baseline noise, calibration standard response, analytical precision and bias data, detection limits, etc. This information may be recorded in logbooks or laboratory notebooks or stored electronically.
- Control Charts: Control charts are useful in evaluating internal laboratory procedures and are helpful in identifying and correcting systematic error sources. Contract laboratories are encouraged to develop and maintain control charts whenever they may serve in determining sources of analytical problems.

4.4 Laboratory Performance Audits/Corrective Action

No additional performance audits will be required as part of this Project. However, participation in performance audits or other intercomparison studies are encouraged.

4.5 Laboratory Performance Measurements

Laboratory performance measurements (also known as Data Quality Indicators) are designed to determine whether data quality criteria are met, as defined below.

4.5.1 Method Blanks

Also called laboratory reagent blanks or preparation blanks, method blanks account for contaminants present in the solvents, preservatives, analytical solutions, or other laboratory equipment used during the quantification of the parameter.

4.5.2 Internal Standards

Internal standards account for error introduced by the analytical instrument.

4.5.3 Replicate Samples

Replicate samples of the raw material can be extracted and analyzed to measure laboratory precision or variability of a chemical in the material.

4.5.4 Laboratory Replicate Samples

Laboratory replicate samples are replicates of extracted material that assess the measurement precision.

4.5.5 Matrix Spike Replicate Samples

Matrix spike replicate samples are used to assess both measurement precision and accuracy. They are especially useful when field samples may not contain many of the target compounds because measuring non-detects in replicates does not allow the data reviewer to measure the precision or the accuracy of the data in an analytical batch.

4.5.6 Matrix Spike Samples

Matrix spike samples are field samples to which a known amount of contaminant is added and measured to determine potential analytical interference present in the field sample.

4.5.7 Certified Reference Materials (CRMs)

Analysis of CRMs is another way of determining measurement accuracy, especially if a CRM contains a certified value at concentrations similar to those expected in the samples to be analyzed. These types of samples serve to check if errors are introduced during the analysis process and at what step(s) and at what magnitude(s).

4.6 Laboratory Quality Control Procedures

The performance-based protocols for analytical chemistry laboratories consist of several elements, as follow:

4.6.1 Instrument Calibration

Upon initiation of an analytical run, after each major equipment disruption, and whenever on-going calibration checks do not meet recommended DQIs (Table 3, Appendix), the system will be calibrated with a full range of analytical standards. Immediately after this calibration procedure, the initial calibration must be verified through the analysis of a standard obtained from a source different from the standards used to initially calibrate the instrumentation. This second standard must be prepared independently and should ideally have certified concentrations of target analytes. Frequently, calibration standards are included as part of a run, interspersed with actual samples. However, this practice does not document the stability of the calibration and is incapable of detecting degradation of individual components, particularly pesticides, in standard solutions used to calibrate the instrument. The calibration curve is acceptable if it has a r^2 of 0.990 or greater for all analytes present in the calibration mixtures. If not, the calibration standards, as well as all the samples in the batch must be re-analyzed. All calibration standards will be traceable to a recognized organization for the preparation and certification of QA/QC materials (e.g., National Institute of Standards and Technology (NIST), National Research Council Canada (NRCC), US EPA, etc.).
Calibration curves will be established for each type of analyte and batch analysis from a calibration blank and a minimum of three analytical standards of increasing concentration, covering the range of expected sample concentrations. Only data from quantification within the demonstrated working calibration range may be reported by the laboratory (i.e., quantification based on extrapolation is not acceptable). Alternatively, if the instrument response is linear over the concentration ranges to be measured in the samples, the use of a calibration blank and one single standard that is higher in concentration than the samples may be appropriate. Samples outside the calibration range will be diluted or concentrated, as appropriate, and reanalyzed.

4.6.2 Documentation of Method Detection Limits

The method detection limit (MDL) is the ability of a method to distinguish between the analytical noise and the measurement signal and can be used to define the analytical limit of detectability. The MDL represents a quantitative estimate of low-level response detected at the maximum sensitivity of a method. The Code of Federal Regulations (40 CFR Part 136) gives the following definition: “The MDL is the minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero and is determined from analysis of a sample in a given matrix containing the analyte.” MDLs will initially be determined according to 40 CFR 136.2 (f) and Appendix B of 40 CFR 136. Determining the MDL with this procedure is elaborate and need not be determined annually provided that:

- No process or method changes have been made.
- Check samples containing an analyte spike at about 2x MDL indicate that the sample is detected. The required frequency of check samples is quarterly. The matrix and the amount of sample (i.e., dry weight of sediment) used in calculating the MDL will match as closely as possible the matrix of the actual field samples and the amount of sample typically used. In order to ensure comparability of results among different laboratories,

target MDL values for the initial chemical analytes have been established for the project. Most are considerably lower than water quality objectives or sediment quality guidelines and provide the foundation for having a high level of certainty in the data.

Laboratories will confirm the ability to analyze low-level samples with each batch. This will be accomplished by analyzing a method blank spiked at 3 to 5 times the method detection limit. Recoveries for organic analyses shall be between 50 and 150% for at least 90% of the target analytes.

4.6.3 Limits of Quantitation

Taylor (1987) states that "a measured value becomes believable when it is larger than the uncertainty associated with it." The uncertainty associated with a measurement is calculated from the standard deviation of replicate measurements of a low concentration standard or a blank. Normally, the MDL is set at three times the standard deviation of replicate measurements, as it is at this point that the uncertainty of a measurement is approximately ±100% at the 95% level of confidence. Values at the MDL may not reflect a signal much above zero and, therefore, are quantitatively not very meaningful. The limit of quantitation (LOQ), as established by the American Chemical Society, is normally ten times the standard deviation of replicate measurements, which corresponds to a measurement uncertainty of ±30% (see Taylor, 1987). By these standard definitions, measurements below the MDL are not believable, measurements between the MDL and LOQ are only semi-quantitative, and confidence in measurements above the LOQ is high. Target MDLs for PCBs in sealant samples are shown in Table 2.

Table 2. Target Method Detection Limits (MDLs) for PCBs in Sealant Samples

Synonym	Analyte	Target MDL (g/kg dry weight)
IUPAC#8	2,4'-DICB	3.6
IUPAC#18	2,2',5-TRCB	6.7
IUPAC#28	2,4,4'-TRCB	1.8
IUPAC#31	2,4',5-TRCB	1.6
IUPAC#33	2',3,4-TRCB	2
IUPAC#44	2,2',3,5'-TECB	2
IUPAC#49	2,2',4,5'-TECB	0.64
IUPAC#52	2,2',5,5'-TECB	1.6
IUPAC#56	2,3,3',4'-TECB	0.78
IUPAC#56/60	2,3,3',4'/2,3,4,4'-TECB	2
IUPAC#60	2,3,4,4'-TECB	1.2
IUPAC#66	2,3',4,4'-TECB	0.92
IUPAC#70	2,3',4',5-TECB	1.1
IUPAC#74	2,4,4',5-TECB	1.1
IUPAC#70/74	2,3',4',5/2,4,4',5-TECB	2.2
IUPAC#77	3,3',4,4'-TECB	2
IUPAC#87	2,2',3,4,5'-PECB	2
IUPAC#87/97	2,2',3,4,5'/2,2',3',4,5-PECB	4.8

IUPAC#95	2,2',3,5',6-PECB	0.99
IUPAC#97	2,2',3',4,5-PECB	2.8
IUPAC#99	2,2',4,4',5-PECB	1.5
IUPAC#101	2,2',4,5,5'-PECB	0.68
IUPAC#105	2,3,3',4,4'-PECB	3.5
IUPAC#110	2,3,3',4',6-PECB	2.9
IUPAC#118	2,3',4,4',5-PECB	3.4
IUPAC#126	3,3',4,4',5-PECB	5
IUPAC#128	2,2',3,3',4,4'-HXCB	1.5
IUPAC#132	2,2',3,3',4,6'-HXCB	2.3
IUPAC#138	2,2',3,4,4',5'-HXCB	2.1
IUPAC#141	2,2',3,4,5,5'-HXCB	2.1
IUPAC#149	2,2',3,4',5',6-HXCB	2
IUPAC#151	2,2',3,5,5',6-HXCB	1.9
IUPAC#153	2,2',4,4',5,5'-HXCB	1.9
IUPAC#156	2,3,3',4,4',5-HXCB	1.2
IUPAC#158	2,3,3',4,4',6-HXCB	2.3
IUPAC#169	3,3'4,4',5,5'-HXCB	2
IUPAC#170	2,2',3,3',4,4',5-HPCB	1
IUPAC#174	2,2',3,3',4,5,6'-HPCB	0.86
IUPAC#177	2,2',3,3',4',5,6-HPCB	1.4
IUPAC#180	2,2',3,4,4',5,5'-HPCB	0.93
IUPAC#183	2,2',3,4,4',5',6-HPCB	0.99
IUPAC#187	2,2',3,4',5,5',6-HPCB	0.78
IUPAC#194	2,2',3,3',4,4',5,5'-OCCB	0.98
IUPAC#195	2,2',3,3',4,4',5,6-OCCB	1.2
IUPAC#201	2,2',3,3',4,5',6,6'-OCCB	0.76
IUPAC#203	2,2',3,4,4',5,5',6-OCCB	1.2
IUPAC#209	DECB	5

4.6.4 Record of Certified Reference Material

As CRMs are routinely included in analysis of batches of reputable laboratories, the historical record of results may also serve as a suitable performance indicator.

4.6.5 Routine Analysis of Certified Reference Materials or Laboratory Control Materials

A laboratory control material (LCM) is similar to a certified reference material in that it is a homogeneous matrix that closely matches the samples being analyzed. A “true” LCM is one that is prepared (i.e., collected, homogenized, and stored in a stable condition) strictly for use in-house by a single laboratory. Alternately, the material may be prepared by a central laboratory and distributed to others (so-called regional or program control materials). Unlike CRMs, concentrations of the analytes of interest in LCMs are not certified but are based upon a statistically valid number of replicate analyses by one or several laboratories. In practice, this

material can be used to assess the precision (i.e., consistency) of a single laboratory, as well as to determine the degree of comparability among different laboratories. If available, LCMs may be preferred for routine (i.e., day to day) analysis because CRMs are relatively expensive. As noted in section 3.2, CRMs can not be analyzed in this Project.

4.7 Precision Criteria

Each laboratory is expected to maintain control charts for use by analysts in monitoring the overall precision of the CRM or LCM. Upper and lower control chart limits (e.g., warning limits and control limits) will be continually updated; control limits based on 99% confidence intervals around the mean are recommended. The relative standard deviation (RSD) will be calculated for each analyte of interest in the CRM based on the last 7 CRM analyses. However, as noted in section 3.2, CRMs can not be analyzed in this Project. Precision will be monitored by the analysis of replicate samples and continuing calibration check solutions (Table 3, Appendix).

4.8 Laboratory Replicates for Precision

A minimum of one sealant sample per batch of 20 samples or fewer will be processed and analyzed in duplicate for precision. The relative percent difference between two replicate samples or the relative standard deviation between more than two replicate samples (RPD or RSD respectively) will be less than the DQIs listed in Table 3 of Appendix B for each analyte of interest. Following are the calculations:

$$\text{RPD} = \frac{\text{ABS (rep 1 - rep 2) X 100}}{\text{Average (rep 1, rep 2)}}$$

$$\text{RSD} = \frac{\text{STDEV (all replicate samples) X 100}}{\text{Average (all replicate samples)}}$$

ABS — absolute value
STDEV — standard deviation

If results for any analytes do not meet the DQI for the RPD or RSD, calculations and instruments will be checked. A repeat analysis may be required to confirm the results. Results that repeatedly fail to meet the objectives indicate sample non-homogeneity, unusually high concentrations of analytes, or poor laboratory precision. In this case, the laboratory is obligated to halt the analysis of samples and investigate the source of the imprecision before proceeding. Due to the nature of the samples, sample homogeneity is likely to be the source of such imprecision.

4.9 Accuracy Criteria

Based on typical results attained by experienced analysts in the past, accuracy control limits have been established both for individual compounds and combined groups of compounds (see matrix spike and continuing calibration check solutions, Table 3 in the Appendix). Due to the inherent

variability in analyses near the method detection limit, control limit criteria for relative accuracy only apply to analytes with true values that are >3 times the MDL established by the laboratory.

4.10 Continuing Calibration Checks

Calibration check solutions traceable to a recognized organization must be inserted as part of the sample stream. The source of the calibration check solution shall be independent from the standards used for the calibration. Calibration check solutions used for the continuing calibration checks will contain all the analytes of interest. The frequency of these checks is dependent on the type of instrumentation used and, therefore, requires considerable professional judgment. All organic analyses shall be bracketed by an acceptable calibration check. A calibration check standard shall be run every 12 hours at a minimum.

If the control limits for analysis of the calibration check solution (set by the laboratories) are not met, the initial calibration must be repeated. The calibration check for 90% of the analytes shall not deviate more than ±20% for PCBs. If possible, the samples analyzed before the calibration check solution that failed the DQIs will be reanalyzed following recalibration. The laboratory will begin by reanalyzing the last sample analyzed before the calibration check solution that failed. If the RPD between the results of this reanalysis and the original analysis exceeds precision DQIs (Table 3, Appendix), the instrument is assumed to have been out of control during the original analysis. If possible, reanalysis of samples will progress in reverse order until it is determined that the RPD between initial and reanalysis results are within DQIs. The laboratory will report only the re-analysis results. If it is not possible or feasible to perform reanalysis of samples, all earlier data (i.e., since the last successful calibration control check) are suspect. In this case, the laboratory will prepare a narrative explanation to accompany the submitted data.

4.11 Laboratory Reagent Blanks

Laboratory reagent blanks (also called method blanks, extraction blanks, procedural blanks, or preparation blanks) are used to assess laboratory contamination during all stages of sample preparation and analysis. For PCB analyses, one laboratory reagent blank will be run in every sample batch. The reagent blank will be processed through the entire analytical procedure in a manner identical to the samples. Reagent blanks should be less than the MDL. A reagent blank concentration > 2x the MDL or > 10% of the lowest reported sample concentration for one or more of the analytes of interest will require corrective action to identify and eliminate the source(s) of contamination before proceeding with sample analysis. If eliminating the blank contamination is not possible, all impacted analytes in the analytical batch shall be flagged. In addition, a detailed description of the contamination source and the steps taken to eliminate or minimize the contamination shall be included in the narrative. Subtracting method blank results from sample results is not permitted.

4.12 Surrogates

The usage of the terms “surrogate,” “injection internal standard,” and “internal standard” varies considerably among laboratories. Surrogates are compounds chosen to simulate the analytes of

interest in organics analyses. Surrogates are used to estimate analyte losses during the extraction and clean-up process and must be added to each sample, including QA/QC samples, prior to extraction. Each laboratory must report the percent recovery of the surrogate(s) along with the target analyte data for each sample.

Each laboratory will set its own warning limit criteria based on the experience and best professional judgment of the analyst. It is the responsibility of the analyst to demonstrate that the analytical process is always "in control" (i.e., highly variable surrogate recoveries are not acceptable for repeat analyses of the same certified reference material and for the matrix spike/matrix spike duplicate).

4.13 Internal Standards

For gas chromatography (GC) analysis, internal standards (also referred to as "injection internal standards" by some analysts) are added to each sample extract just prior to injection to enable optimal quantification, particularly of complex extracts subject to retention time shifts relative to the analysis of standards. Internal standards are essential if the actual recovery of the surrogates added prior to extraction is to be calculated. The internal standards can also be used to detect and correct for problems in the GC injection port or other parts of the instrument. The compounds used as internal standards will be different from those used as surrogates. The analyst will monitor internal standard retention times and recoveries to determine if instrument maintenance, repair, or changes in analytical procedures are indicated. Corrective action will be initiated based on the judgment of the analyst. Instrument problems that may have affected the data or resulted in the reanalysis of the sample will be documented properly in logbooks and internal data reports and used by the laboratory personnel to take appropriate corrective action.

4.14 Dual-Column Confirmation

Dual-column chromatography is required for analyses using GC-ECD due to the high probability of false positives arising from single-column analyses. GC-ECD will not be used in this Project, however.

4.15 Matrix Spikes and Matrix Spike Duplicates

A laboratory-fortified sample matrix (a matrix spike, or MS) and a laboratory fortified sample matrix duplicate (a matrix spike duplicate, or MSD) will be used both to evaluate the effect of the sample matrix on the recovery of the compounds of interest and to provide an estimate of analytical precision. A minimum of 5% of the total number of samples submitted to the laboratory will be selected at random for analysis as matrix spikes and matrix spike duplicates. A field sample is first homogenized and then split into three subsamples. Two of these subsamples are fortified with the matrix spike solution and the third subsample is analyzed to provide a background concentration for each analyte of interest. The final spiked concentration of each analyte in the sample will be at least 10 times the MDL for that analyte, as previously calculated by the laboratory. Additionally, the total number of spikes should cover the range of expected concentrations. Recovery is the accuracy of an analytical test measured against a known analyte addition to a sample. Recovery is calculated as follows:

$$\text{Recovery} = \frac{\text{(Matrix plus spike result - Matrix result) X 100}}{\text{Expected matrix plus spike result}}$$

Recovery data for the fortified compounds ultimately will provide a basis for determining the prevalence of matrix effects in the samples analyzed during the project. If the percent recovery for any analyte in the MS or MSD is less than the recommended warning limit of 50 percent, the chromatograms and raw data quantitation reports will be reviewed. If an explanation for a low percent-recovery value is not discovered, the instrument response may be checked using a calibration standard. Low recoveries of matrix spikes may result from matrix interferences and further instrument response checks may not be warranted. This is especially true if the low recovery occurs in both the MS and MSD, and the other QC samples in the batch indicate that the analysis was "in control." An explanation for low percent-recovery values for MS/MSD results will be discussed in the narrative accompanying the data package. Corrective actions taken and verification of acceptable instrument response will be included. Analysis of the MS/MSD is also useful for assessing laboratory precision. The RPD between the MS and MSD results should be less than the target criterion listed in Table 3 of the Appendix for each analyte of interest.

4.16 Field Replicates

The analysis of field replicates and field splits can provide an assessment of both inter-and intra-laboratory precision and variance in the sample matrix at the field site. Field replicates will not be analyzed in this Project (see 'Field Sampling and Chemical Analysis Plan' for more information).

5. Assessments and Project Oversight

5.1 Contractor Quality Control

The Project Manager will ensure that qualified personnel are employed in all phases of project implementation and that all personnel receive appropriate training to complete assigned tasks consistent with project workplans.

5.2 Assessments and Response Actions

No audits of sampling personnel will be required as part of this project. However, before any field sampling is conducted, the Contractor Project Manager will verify that proper equipment is available for all field personnel. This includes sampling equipment, safety equipment, and field measurement equipment (if appropriate). It will also be verified that all personnel involved in field activities have received sufficient training and are able to properly use the equipment and follow procedures. The Project Manager may also verify the application of procedures and equipment periodically. If the Project Manager or Field Program Manager finds any deficiencies, corrective actions will be put in place and reported, and follow-on inspections will be performed to ensure the deficiencies have been addressed.

No audits of analytical laboratories will be performed as part of this project. However, it is

expected that regularly performed audits of the analytical laboratory are conducted through other quality assurance programs (e.g., RMP). The analytical laboratory is responsible for making any corrections needed to address data quality issues relevant to the project and to report these corrective actions to the Data Manager.

5.3 Reports to Management

In addition to the QAPP, the Field Sampling and Chemical Analysis Plan, and reports produced through the implementation of the project, quarterly progress reports will be developed and submitted to the Project Manager by the contractor. These progress reports will document project status, any significant field or laboratory issues, timeliness of scheduled field and analytical activities, any significant QA problems, or other issues, and provide recommended solutions, if applicable.

6. Data Validation and Usability

Data verification and data validation are key steps in the completion of the Project. The Project incorporates the following definitions:

6.1 Data Verification

Data verification is confirmation by examination and provision of objective evidence that specified requirements have been fulfilled. Data verification is the process of evaluating the completeness, correctness, and conformance/compliance of a specific data set against the method, procedural, or contractual requirements.

6.2 Data Validation

Data validation is confirmation by examination and provision of objective evidence that the particular requirements for a specific intended use are fulfilled. Data validation is an analyte-and sample-specific process that extends the evaluation of data beyond method, procedural, or contractual compliance (i.e., data verification) to determine the analytical quality of a specific data set.

6.3 Reconciliation with User Requirements

For laboratory data, when the data are reported to the Data Manager, if there is an outlier, data fails to meet DQIs, or other question arises with the data, the Data Manager is responsible for determining the acceptability of the data in question. Usually, the Project Chemist is contacted directly to resolve any questions. When the Data Manager is satisfied with the accuracy of the laboratory data in question, the data is considered acceptable and may be used as part of the overall dataset.

7. References

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8. Appendix: Analytical Method for PCBs in Sealants

PCB CONGENERS BY GC/MS

1.0 SCOPE, APPLICATION, AND METHOD CAPABILITIES

1.1 This method is used for the determination of chlorinated biphenyl congeners (PCBs) in sediments, soils, and miscellaneous samples by gas chromatography/mass spectrometry.

1.2 The target analytes and current method detection limit (MDL) values can be reviewed on the Laboratory Service Division web site.

2.0 SUMMARY OF METHOD

2.1 Samples are homogenized and a sub-sample removed for moisture determination.

2.2 Samples (10 g wet weight) are spiked with a surrogate spiking solution and are extracted with 1:1 acetone/dichloromethane using a Dionex ASE extractor (SOP 325).

2.3 The extract is then dried through a sodium sulfate column and concentrated using a J2 Scientific AccuVap. An internal standard is then added to each extract and cleaned up with a one-step GPC.

2.4 An aliquot of the final extract is injected into the gas chromatograph (GC). The analytes are separated by the GC and detected by a mass spectrometer.

3.0 SAMPLE COLLECTION, PRESERVATION AND HOLDING TIMES

3.1 All samples must be iced or refrigerated at <4°C from time of collection until delivery to the laboratory. Store samples in the dark at <-10°C.

3.2 There are no demonstrated maximum holding times associated with the PCBs in solid or other sample matrices. If stored in the dark at <-10°C, solid samples may be stored for up to one year.

4.0 COMMENTS

4.1 Raw data from all blanks, samples, and spikes must be evaluated for interference. Determine if the source of interference is in the preparation and/or cleanup of the samples and take corrective action to eliminate the problem.

4.2 Contamination by carryover can occur whenever high-concentration and low-concentration samples are sequentially analyzed. To reduce carryover, thoroughly wash and rinse glassware, vessels, and syringes between samples. Whenever an unusually concentrated sample is encountered, it

should be followed by the analysis of solvent to check for cross contamination.

5.0 SAFETY

5.1 General laboratory practices for handling organic solvents apply to working with dilute PCB standards. In accordance with Safety SOP 214, use approved eye protection and wear nitrile gloves. Prepare dilutions and spiked samples in a fume hood.

5.2 Chemical and other safety relation information is contained in the Material Safety Data Sheets (MSDS) that are maintained in the Laboratory Library and are available on-line at http://hazard.com/msds/ and http://msds.ehs.cornell.edu/msdssrch.asp.

6.0 INSTRUMENTATION/EQUIPMENT

6.1 Dionex Accelerated solvent extraction (ASE) system- pre-extracted

6.2 Whatman 19.8 mm glass fiber filter (Dionex P/N 047017), or equivalent muffled.

6.3 Aluminum weighing dishes (VWR 25433-008 or equivalent)

6.4 Chromatography columns w/o reservoir, solvent rinsed stopcocks

6.5 Disposable Pasteur pipettes

6.6 Gel-permeation chromatography system - an HPLC pump, an auto sampler, and a fraction collector.

6.6.1 GPC- Chromatographic column- Envirogel GPC Cleanup Column 19mm ID x 300mm Methylene Chloride (WAT036554, or equivalent)

6.7 GC columns- suggested 30 m x 0.25 mm ID 0.25 µm film SPB-octyl capillary column (Supelco 2-4218, or equivalent). Retention time specified in Table 2 must be met prior to performing analyses.

6.8 Automated concentration system – AccuVap Inline & FLX Concentration System or AccuVap EVS

6.9 Perkin Elmer Clarus 500 GCMS, or equivalent, capable of scanning from 50 to 600 amu.

7.0 REAGENTS AND STANDARDS

7.1 Organic-free reagent water - All references to water in this method refer to organic-free reagent water produced by a Millipore Milli-Q system.

7.2 Native congener mix stock solutions for separation of individual congeners on the SPB-octyl column. Purchase Accustandard M1668A-1, M1668A-2, M1668A-3, M1668A-4, M1668A-5, or equivalent. The five solutions, measured individually, allow resolution of all 209 congeners to establish retention times for each congener.

7.3 Individual stock solutions of congeners of interest (Accustandard and Ultra Scientific).

7.4 Internal Standard: Tetrachloro-m-xylene Accustandard S-279-5x

7.5 Surrogate Solution: IUPAC #103 & #198 100ug/mL in isooctane. Accustandard C-103S-TP and C-198S-TP.

7.6 Acetone, methylene chloride and other appropriate solvents - Pesticide quality or equivalent.

7.7 Pelletized diatomaceous earth. Varian 0019-8003 or equivalent. Muffled.

7.8 Sodium sulfate. Muffled.

7.9 Ottawa sand. Muffled.

7.10 Glass Wool. Muffled.

8.0 PROCEDURE

8.1 Instrument Operating Conditions

Initial temperature:	75 °C, hold for 2 minutes
Temperature program:	15 °C/min to 150 °C,
	2.5 °C/min to 290 °C, hold 1 min.
Sample volume:	2.5 µL
Injector temperature:	260 °C
Interface temperature:	250 °C
Flow:	1.0 ml/min
Scan Range:	10-62 min at 181-508 amu
Scan Time:	0.35 second

The GC conditions may be optimized for compound separation and sensitivity. Once optimized, the same GC conditions must be used for the analysis of all standards, blanks, and QC samples.

8.2 Preparation of Calibration and Check Standards

8.2.1 Combine and dilute the solutions in section 7.2 to produce at least 5 calibration solutions of the individual PCBs between 50 and 3770 ng/mL or higher if necessary.

8.2.2 A check standard (CCC), containing all congeners of interest is prepared at a concentration of 1000 ng/mL for native compounds and 500 ng/mL for the internal standard and surrogates (IUPAC 103&198).

8.3 Preparation of QC Samples

8.3.1 Spike/LCS standards - Prepare a standard solution containing all the PCBs of interest at concentrations of 1.0 µg/mL. Use 1.0 mL of the 1.0 µg/mL solution for spike blank and matrix spike samples. Use 150 µL for the LCS samples.

8.3.2 Surrogate solution - This solution is added to every sample (client and QC) before extraction. The solution contains congeners 103 and 198 at 0.50 µg/ml. Spike each sample with 1.0 mL.

8.4 Sample Preparation

8.4.1 Samples, duplicates, and matrix spikes are homogenized and a 10 gram subsample is weighed for extraction. Use a smaller sample size if the sample matrix is expected to be dirty or contains very high concentrations of PCBs. An additional subsample of each sediment samples is weighed for% solid determination. The sample for extraction, after weighing, is mixed with pelletized diatomaceous earth until a dry, free-flowing mixture is obtained. This mixture is then placed into an ASE extraction cell. Add the surrogate solution (1.0 mL of 8.3.2) and, if needed, the appropriate amount of spiking standard (8.3.1) to the ASE vessels. Extract the sample with 1:1 acetone/ dichloromethane at elevated temperature and pressure. Total extraction time is ~ 30 min. See SOP 325 for operational details.

8.4.2 The method blank, LCS, and spike blank samples are prepared with 10 grams of muffled Ottowa sand.

8.4.3 The extracts are dried with muffled granular Na_2SO_4.

8.4.4 If an aqueous layer is visible in the extract, slowly add about 16.5 gm of muffled Na_2SO_4 to extract and mix well prior to pouring extract into drying column.

8.4.5 Dried extracts are to be evaporated to dryness and diluted to 2.5 mL of $MeCl_2$ for GPC using an AccuVap.

8.4.6 Prior to GPC, filter the 2.5 mL extract through a 0.45µ PVDF Captiva 3mL columns if necessary.

8.4.7 Add 10 µL of internal standard into every extract. Bring volume to 2.5 mL.

8.4.8 Set up GPC clean-up with inline evaporation per SOP 356.

8.4.9 Remove final extracts promptly upon completion of GPC cleanup and concentration. Replace slit septa caps with crimp caps.

9.0 CALIBRATION

9.1 Mass spectrometer calibration

9.1.1 Supelco SPB-Octyl fused silica capillary column (C/N 24218-U 30m x 0.25mm x 0.25µm film thickness) or comparable should be used.

9.1.2 The GC/MS system must be hardware-tuned to meet the criteria in Table 1 for a 50 ng injection of DFTPP. Analyses should not begin until all these criteria are met. Background subtraction should be straightforward and designed only to eliminate column bleed or instrument background ions.

Table 1
DFTPP Key Ions and Ion Abundance Criteria
(EPA 625 Criteria)

Mass	Ion Abundance Criteria
51	30-60% of base peak of mass 198
68	< 2% of mass 69
70	< 2% of mass 69
127	40-60% of base peak
197	< 1% of mass 198
198	Base peak, defined as 100%
199	5-9% of mass 198
275	10-30% of mass 198
365	> 1% of base peak
441	Present but less than mass 443
442	> 40% of mass 198
443	17-23% of mass 442

9.2 Quantitative analysis

9.2.1 When a compound has been identified, the quantitation of that compound will be based on the integrated abundance of the primary ions (Table 2).

9.2.2 If the %RSD of a compound's relative response factor (initial calibration) is 15% or less, then the concentration in the extract may be determined using the average response factor from the initial calibration data. Alternatively, a linear or quadratic regression with a coefficient of variance >0.998 may be used.

9.2.3 Use the data system to compute the concentration of the analyte in the sample, using an internal standard calibration. Calculate the concentration of the analyte in the initial sample.

Table 2 – Target Analytes, Retention Times, Selected Ions, and References

Compound	Retention Time	m/z	Reference
Tetrachloro-m-xylene	15.90	242+244	Internal Standard
IUPAC 103 (Surrogate)	28.37	324+326	Tetrachloro-m-xylene
IUPAC 198 (Surrogate)	47.89	428+430	Tetrachloro-m-xylene
IUPAC 8	16.96	222+224	IUPAC 103
IUPAC 18	19.18	256+258	IUPAC 103
IUPAC 28	23.24	256+258	IUPAC 103
IUPAC 31	22.93	256+258	IUPAC 103
IUPAC 33	23.46	256+258	IUPAC 103
IUPAC 44	26.10	290+292	IUPAC 103
IUPAC 49	25.58	290+292	IUPAC 103
IUPAC 52	25.08	290+292	IUPAC 103
IUPAC 56	31.03	290+292	IUPAC 103
IUPAC 60	31.25	290+292	IUPAC 103
IUPAC 66	30.34	290+292	IUPAC 103
IUPAC 70/74	30.01	290+292	IUPAC 103
IUPAC 87/97	33.30	326+328	IUPAC 103
IUPAC 95	29.08	326+328	IUPAC 103
IUPAC 99	32.67	326+328	IUPAC 103
IUPAC 101	32.08	326+328	IUPAC 103
IUPAC 105	38.42	326+328	IUPAC 103
IUPAC 110	34.12	326+328	IUPAC 103
IUPAC 118	37.18	326+328	IUPAC 103
IUPAC 126	41.64	326+328	IUPAC 198
IUPAC 128	41.65	358+360+362	IUPAC 198
IUPAC 132	39.05	358+360+362	IUPAC 198
IUPAC 138	40.34	358+360+362	IUPAC 198
IUPAC 141	39.26	358+360+362	IUPAC 198
IUPAC 149	35.96	358+360+362	IUPAC 198
IUPAC 151	35.00	358+360+362	IUPAC 198
IUPAC 153	37.26	358+360+362	IUPAC 198
IUPAC 156	44.59	358+360+362	IUPAC 198
IUPAC 158	40.73	358+360+362	IUPAC 198
IUPAC 170	47.28	394+396+322+324+326	IUPAC 198
IUPAC 174	42.30	394+396+322+324+326	IUPAC 198
IUPAC 177	43.01	394+396+322+324+326	IUPAC 198
IUPAC 180	45.98	394+396+322+324+326	IUPAC 198
IUPAC 183	42.30	394+396+322+324+326	IUPAC 198
IUPAC 187	41.67	394+396+322+324+326	IUPAC 198
IUPAC 194	52.56	428+430+432+356+358+360	IUPAC 198
IUPAC 195	50.17	428+430+432+356+358+360	IUPAC 198

Compound	Retention Time	m/z	Reference
IUPAC 201	44.00	428+430+432+356+358+360	IUPAC 198
IUPAC 203	48.81	428+430+432+356+358+360	IUPAC 198
IUPAC 209	56.33	494+504+424+432+214	IUPAC 198

10.0 QA/QC REQUIREMENTS

10.1 The batch QC Requirements are outlined in Table 3.

10.2 No more than 20 client samples can be included in an analytical batch.

10.3 Compute the percent recovery of the surrogate standard spiking solution using an internal standard calibration method.

10.4 Analyze the method blank immediately after the LCS to analyze freedom from contamination and carryover from the LCS.

Table 3 – Batch QC Requirements

QC Type	Batch Requirement	Acceptance Criteria	Corrective Action
MS tuning check	Prior to analyzing samples	See Table 1 and section 8.5	Retune and adjust the MS
Calibration	Acceptable calibration	RF <20% RSD, or if using 1st or 2nd order regression, =/> 0.998	Correct instrument or standard problem. Recalibrate.
Spike Blank	Fortify at same concentration as MS samples	+/- 30 % recovery	Requires reextraction and reanalysis if more than 10% of the analytes fail to meet acceptance criterion.
Continuing Calibration Check	1 at the beginning of each analytical run, every 12 hrs and at the end of the run. Concentration at cal mid-range.	+/- 20% recovery.	Recalibrate. Rerun with fresh standard if CCC continues to fail. If recoveries are outside of the control limits flag sample with “N”.
Low Level Spike Blank (LCS)	1 per batch. Concentration at lowest calibration level.	+/- 50% recovery.	If recoveries are outside of the control limits flag sample with “N”.
Method Blank	1 per batch.	Target analytes below MDL.	Reanalyze method blank to confirm. May require re-extraction and reanalysis. Flag detected compounds in samples that are also present in the blank with a “B”.

QC Type	Batch Requirement	Acceptance Criteria	Corrective Action
Matrix Spike	1 per batch or 10% of samples. Spike concentration set at the calibration mid-level.	±35% recovery	Flag spiked sample and base with "N", if recoveries are outside control limits.
Matrix Duplicate	1 per batch or 10% of samples.	Acceptance Criteria < 50 % RPD for concentrations > 10 MDL for 90% of analytes	Flag outliers with "*", samples < 10 MDL flagged with a V. Requires re-extraction and re-analysis if more than 10% of the analytes fail to meet the acceptance criterion.

11.0 REFERENCES

11.1 EPA Method 1668, Revision A: Chlorinated Biphenyl Congeners in Water, Soil, Sediment and tissue by HRGC/HRMS, Revision A (1999). U.S. EPA, Office of Science and Technology, 401 M Street, SW, Washington, DC, 20460.

11.2 EPA Method 625. Base/Neutral and Acids. 40 CFR Part 136 Appendix A. Methods for Organic Chemical Analysis of Municipal and Industrial Wastewater. Revised as of July 1st, 1995.

11.3 EPA Method 8270D, Revision 4, February 2007. Semivolatile Organic Compounds by Gas Chromatography/Mass Spectrometry (GC/MS). SW846 On-line. http://www.epa.gov/epawaste/hazard/testmethods/sw846/pdfs/8270d.pdf

Laboratory Supervisor

Quality Control Assurance Officer

Laboratory Manager

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RMP Special Study Proposal: Synthesis of Information on PCBs
Estimated Cost: $53,000
Oversight Group: TRC, CFWG
Proposed by: Jay Davis, SFEI

PROPOSED DELIVERABLES AND TIME LINE

Deliverable	Due Date
Draft outline	December 2010
Draft report	May 2011
Final report	August 2011

BACKGROUND AND JUSTIFICATION

The RMP PCB Strategy Team formulated a PCB Strategy in 2009. The Team recognized that a significant body of new information has been generated since the PCBs TMDL Staff Report was prepared. Some of the important new datasets include:

- Surface sediment data obtained using more accurate analytical methods (high resolution mass spectrometry) and the randomized sampling design
- Water data from the new random design
- Additional trend data from sport fish, bivalves, and bird eggs
- Surprising data from small fish showing higher than expected concentrations
- Additional data suggesting the possibility of toxic effects on avian embryos
- Information on a "new" PCB (PCB 11) that is abundant and ubiquitous
- Information on the entire suite of 209 congeners, now available for several matrices in the Bay

The RMP PCB Strategy has articulated management questions to guide a long-term program of studies to support reduction of PCB impairment in the Bay (see below). The PCB Team recommended two studies to begin addressing these questions. The first recommended study was to take advantage of an opportunity to piggyback on the final year of the three-year small fish mercury sampling in 2010. The second study recommended was a synthesis and conceptual model update based on the information that has been generated since the writing of the TMDL Staff Report. The Team considered this a prudent next step to ensure effective use of RMP funds and to form the basis for a plan for the next few years of PCB studies. The Team outlined the scope for this synthesis effort (see below).

APPLICABLE RMP MANAGEMENT QUESTIONS

The most relevant questions for this synthesis are the questions articulated specifically for the PCB Strategy.

1. What potential for impacts on humans and aquatic life exists due to PCBs?
2. What are appropriate guidelines for protection of beneficial uses?
3. What is the total maximum daily load of PCBs that can be discharged without impairment of beneficial uses?

4. What are the rates of recovery of the Bay, its segments, and in-Bay contaminated sites from PCB contamination?
5. What are the present loads and long-term trends in loading from each of the major pathways?
6. What role do in-Bay contaminated sites play in segment-scale recovery rates?
7. Which small tributaries and contaminated margin sites are the highest priorities for cleanup?
8. What management actions have the greatest potential for accelerating recovery or reducing exposure?
9. What is the most appropriate index for sums of PCBs?

OBJECTIVES AND APPROACH

The goal of the synthesis effort will be to produce a technical report that answers, to the extent possible, the PCB Strategy questions based on the information that has accumulated to date. Other questions may also be addressed. Stakeholder input on an outline of the report will be obtained as a first step in the project.

A considerable body of information generated by the RMP and other programs has accumulated in recent years. Some of the datasets to be covered in the review are listed below.

- Status and Trends: RMP (Sport fish, Bivalves, Avian eggs, Sediment, Water)
- RMP PCB Strategy: Small fish
- Effects:USFWS Avian egg work, UC Davis Effects on fish
- Fate: RMP (cores, multibox model)
- Loading Studies: Central Valley loads (RMP), Small tributaries (loading studies, BMP study), atmospheric deposition (global, local), POTWs (Region 2)

Stakeholder suggestions on additional datasets to include will also be encouraged.

The PCB Team also recommended reviewing and making recommendations related to several other sources of information.

- TMDLs and abatement actions from elsewhere to evaluate lessons learned and whether there are rules or thumb for what works and what doesn't work.
- Information on PCB 11. A related issue is the most appropriate index of total PCBs – whether to include PCB 11 and how many congeners to include in routine measurements and sums.
- The linkage between sediment and sport fish, including an evaluation of why concentrations appear to have declined in bivalves and sediments, but not in sport fish.
- Evaluation of sources using congener profiles.
- Updated estimates of nearshore ambient average concentrations and the inventory of PCBs in various compartments of the Bay ecosystem.
- An update of the Gobas food web model using the new sediment data.
- A review of literature on estuarine degradation rates, which have a large influence on predictions of the rate of recovery of the Bay.

- A review of literature on rates of attenuation of PCB loads from watersheds, which also have a large influence on Bay recovery.

The synthesis will also evaluate progress relative to the report: PCBs in San Francisco Bay: Impairment Assessment/Conceptual Model Report developed by SFEI for the Clean Estuary Partnership (Davis et al. 2006).

LITERATURE CITED

Davis, J.A., F. Hetzel, and J.J. Oram. 2006. PCB Impairment Assessment/Conceptual Model Report. Prepared for the Clean Estuary Partnership.

BUDGET

The estimated budget for this task is $53,000, all for SFEI labor. The hours allocated for each staff person are indicated below.

	Hours
Jay Davis	120
Don Yee	40
Ben Greenfield	40
Jon Leatherbarrow	120
Lester McKee	40
John Ross	80
Rachel Allen	80

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Sustainable Conservation

Investor's Circle Update

Dedicated Decade: An Update on the Brake Pad Partnership

From the Bay to the boardroom, the lab to the Legislature, Sustainable Conservation's Brake Pad Partnership has come a long way since its inception over a decade ago. For years, the Partnership – an uncommon alliance of brake manufacturers, stormwater agencies and environmental groups – has worked tirelessly to identify and address the environmental consequences of copper from automobile brake pads. Beyond its specific project scope, the Partnership is a remarkable example of where Sustainable Conservation has been and where we're going.

Copper from automobile brake pads is contributing to the decline of endangered fish such as coho and steelhead by interfering with their ability to identify predators and locate spawning grounds.

COPPER 101

Each time drivers step on their brakes, small amounts of debris are released onto streets, into the air and, eventually, into waterways. No big deal, right? Wrong. California drivers hit their brakes hundreds of millions of times a day – which adds up to a substantial quantity of debris, much of which contains copper. Copper that ends up in streams, rivers and coastal waters is toxic to phytoplankton and disrupts the aquatic food chain. Elevated copper levels are also one of the factors contributing to the decline of salmon populations. What's worse, once copper has been deposited into water, it is extremely difficult – and extremely expensive – to get it out.

High levels of copper are found in urban watersheds across California. Through maximum allowable limits for copper pollution mandated by the State Water Resources Control Board, municipalities within these watersheds are now responsible for taking onerous and costly clean-up measures – and they have to demonstrate significant progress toward compliance by 2018.

Could brake pads be the culprit? Moreover, could they provide the key to an economically viable solution to the problem? Sustainable Conservation set out to investigate.

A COLLABORATIVE APPROACH

Instead of polarizing environmental and industry interests by heading straight to the courtroom, we convinced the various stakeholders to try a

(continued)

"By banning the use of copper in vehicle brake pads, California has the opportunity to again lead the nation in protecting our environment."

Senator Christine Kehoe (D-San Diego), author of Senate Bill (SB) 346

Sustainable Conservation

Investor's Circle Update

98 BATTERY STREET, SUITE 302, SAN FRANCISCO, CA 94111 PHONE: (415) 977-0380 FAX: (415) 977-0381 WWW.SUSCON.ORG

An Update on the Brake Pad Partnership

different approach: collaboration. In 1996, Sustainable Conservation convened the Partnership to understand the impact of copper from brake pads on water quality. When joining the Partnership, industry representatives agreed that if science showed copper in brake pads was indeed a significant contributor to water quality degradation, they would voluntarily reduce copper in brake pad formulations.

PIVOTAL OUTCOMES

Over the years that followed, the Partnership conducted rigorous scientific studies to determine the role brake pads play in elevated copper levels within San Francisco Bay Area watersheds. The results of these studies indicate that copper from brake pads accounts for the majority of the human-generated copper in highly urbanized watersheds. With this news, the industry was ready to honor its commitment AND raise the stakes on behalf of the Golden State's environmental and economic health.

NEW DIRECTIONS

By recommending the introduction of state legislation to limit the amount of copper in brake pads, the industry helped steer the Partnership – and Sustainable Conservation – into the policy realm. This initially surprising recommendation ultimately makes great sense: legislation would address environmental and economic concerns by maximizing positive impact on water quality and guaranteeing a level playing field for all brake pad manufacturers. Dynamic solutions are the name of the game at Sustainable Conservation, and the Partnership's willingness to adapt its strategy accordingly speaks to the importance of persistence and flexibility in effecting powerful environmental change.

In early 2009, Sustainable Conservation introduced Senate Bill (SB) 346, authored by Senator Christine Kehoe (D-San Diego), to reduce and eventually remove copper from brake pads sold in California, thereby addressing a serious threat to aquatic health and allowing local governments to meet their obligations under the Clean Water Act. The bill also requires that new brake pads meet all applicable safety and performance standards, and includes provisions to ensure that copper will not be replaced by materials containing other harmful substances.

VICTORY, REGROUPING

SB 346 passed out of the California State Senate on June 3 – a very exciting day! To bolster our chances at success in the State Assembly, the Partnership decided to make SB 346 a two-year bill. For now, the bill is being held in the Assembly Committee on Environmental Safety and Toxic Materials, with the goal of taking it up again in the 2010 legislative session. This additional time will allow the Partnership to further clarify and strengthen the bill, and conduct outreach with and allay concerns for those individuals and organizations currently opposed to the bill (including the car companies). The coming months will also provide an opportunity to formalize implementation and enforcement specifics for the copper reduction program.

THE ROAD AHEAD

Building on a decade of sound science and balanced problem-solving, the Partnership has made extraordinary progress on behalf of California's water quality in 2009. By raising consciousness about the power of our cooperative approach, Sustainable Conservation has already set a positive precedent in the Legislature. In 2010, we hope California will take the next big step by approving and signing SB 346 – a truly collaborative solution to a serious environmental problem. ■

To learn more, visit www.suscon.org/bpp.

After passing out of the California State Senate, SB 346, which aims to effectively eliminate all copper in brake pads sold in California, will go before the State Assembly in 2010.

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AMENDED IN ASSEMBLY JUNE 21, 2010

AMENDED IN ASSEMBLY JUNE 7, 2010

AMENDED IN ASSEMBLY JUNE 24, 2009

AMENDED IN SENATE JUNE 1, 2009

AMENDED IN SENATE MAY 20, 2009

AMENDED IN SENATE APRIL 23, 2009

AMENDED IN SENATE APRIL 2, 2009

SENATE BILL No. 346

Introduced by Senators Kehoe and Simitian

February 25, 2009

An act to add Article 13.5 (commencing with Section 25250.50) to Chapter 6.5 of Division 20 of the Health and Safety Code, relating to hazardous materials.

LEGISLATIVE COUNSEL'S DIGEST

SB 346, as amended, Kehoe. Hazardous materials: motor vehicle brake friction materials.

(1) Existing law establishes the Department of Toxic Substances Control in the California Environmental Protection Agency, with powers and duties regarding the management of hazardous waste. Existing law, administered by the department, prohibits the management of hazardous waste except in accordance with the hazardous waste control laws, including laws governing the removal of any mercury-containing vehicle light switch from a vehicle, and the regulations adopted by the department. A violation of the hazardous waste control laws is a crime.

The bill, commencing on January 1, 2014, would prohibit the sale of any motor vehicle brake friction materials containing specified constituents in amounts that exceed certain concentrations. The bill, commencing on January 1, 2025, would prohibit motor vehicle brake friction materials exceeding 0.5% copper by weight from being sold in California. The bill, commencing on January 1, 2014, would require all manufacturers of motor vehicle brake friction materials that are sold in this state to obtain a certification of compliance with these requirements from a 3rd-party testing certification agency, and to mark proof of certification on the friction materials. The bill would require a manufacturer of brake friction materials to file a copy of the 3rd-party certification with the department and to pay a reasonable filing fee. A violation of these provisions would be subject to a civil fine of up to $10,000 per violation. Because a violation of these provisions would also be a crime pursuant to the hazardous waste control laws, the bill would impose a state-mandated local program.

(2) Existing law requires the department to adopt regulations to establish a process to identify and prioritize chemicals of concern in consumer products. As part of this process, the department is required to adopt regulations for the evaluation of chemicals of concern in consumer products, including a process for evaluating alternatives.

This bill would direct the department to require vehicle brake manufacturers to comply with the regulations for the department's evaluation of chemicals of concern and, before those regulations are adopted, to ensure that formulations developed to comply with the above content requirements are less harmful to health and the environment.

~~(2)~~

(3) The California Constitution requires the state to reimburse local agencies and school districts for certain costs mandated by the state. Statutory provisions establish procedures for making that reimbursement.

This bill would provide that no reimbursement is required by this act for a specified reason.

Vote: majority. Appropriation: no. Fiscal committee: yes. State-mandated local program: yes.

The people of the State of California do enact as follows:

1 SECTION 1. The Legislature finds and declares all of the
2 following:

(a) Friction materials are an essential component of motor vehicle brake systems and of critical importance to transportation safety and the public safety in general.

(b) Debris from friction materials containing copper in all of its forms, including, but not limited to, elemental copper and all of its alloys and compounds, are generated and released to the surrounding environment in the course of normal brake system operation.

(c) Tens of thousands of pounds of copper and other substances released from brake friction materials enter California's streams, rivers, and marine environment every year.

(d) Copper is toxic to many aquatic organisms, including salmon.

(e) Limits on the copper content of brake friction materials are essential for California cities, counties, and industries to comply with federal Clean Water Act (33 U.S.C. Sec. 1251 et seq.) mandates, including copper water quality standards and copper total maximum daily loads in California's urban watersheds.

(f) Without limits on the copper content of brake friction materials, California taxpayers face billions of dollars in federal Clean Water Act compliance costs.

(g) Changes in the composition of brake friction materials made to comply with copper water quality standards and successfully implement copper total maximum daily loads in California's urban watersheds should meet all applicable safety standards.

SEC. 2. Article 13.5 (commencing with Section 25250.50) is added to Chapter 6.5 of Division 20 of the Health and Safety Code, to read:

Article 13.5. Motor Vehicle Brake Friction Materials

25250.50. For purposes of this article, the following definitions apply:

(a) "Board" means the State Water Resources Control Board.

(b) "Department" means the Department of Toxic Substances Control.

(c) "Motor ~~Vehicle~~ *vehicle*" has the same meaning as "vehicle" is defined in Section 670 of the Vehicle Code.

(d) "Testing certification agency" means an agency approved by the department as qualified and equipped for the certification

of testing of products, materials, equipment, and installations in accordance with nationally recognized standards.

25250.52. On and after January 1, 2025, any motor vehicle brake friction materials exceeding 0.5 percent copper by weight shall not be sold in this state.

25250.54. On and after January 1, 2014, any motor vehicle brake friction materials containing any of the following constituents in an amount that exceeds the following concentrations shall not be sold in this state:

(a) Cadmium and its compounds: 0.01 percent by weight.

(b) Chromium(VI)-salts: 0.1 percent by weight.

(c) Lead and its compounds: 0.1 percent by weight.

(d) Mercury and its compounds: 0.1 percent by weight.

(e) Asbestiform fibers: 0.1 percent by weight.

25250.56. (a) The department shall require vehicle brake manufacturers to comply with *the regulations adopted pursuant to subdivision (a) of* Section 25253 in their development of brake friction materials ~~that comply with Sections 25250.52 and 25250.54~~. In the process of complying with *the regulations adopted pursuant to subdivision (a) of* Section 25253, a manufacturer shall give specific consideration to the cumulative impacts on health and the environment of alternatives that increase the use of nickel, zinc, and antimony.

~~(b) This section does not authorize the department to modify or disregard the requirements in Section 25250.52 or 25250.54.~~

~~(c)~~

(b) Prior to the enactment of regulations implementing Section 25253, a vehicle brake friction material manufacturer shall exercise due diligence to ensure that formulations developed to comply with Sections 25250.52 and 25250.54 are less harmful to health and the environment.

25250.58. The following motor vehicle classes and brakes are exempt from this article:

(a) Military combat vehicles.

(b) Vehicles employing internal closed oil immersed brakes, or a similar brake system that is fully contained and emits no copper, other debris, or fluids under normal operating conditions.

(c) Brakes designed for the primary purpose of holding the vehicle stationary and not designed to be used while the vehicle is in motion.

(d) Motorcycles.

25250.60. (a) Commencing on January 1, 2014, all manufacturers of friction materials used in brakes on new motor vehicles, or as replacement parts, that are sold in this state shall obtain certification from a third-party testing certification agency that each of their formulations for brake friction materials complies with Section 25250.54. A certification shall be valid for no more than three years. Manufacturers shall mark proof of certification on all brake friction materials.

(b) Commencing on January 1, 2025, all manufacturers of friction materials used in brakes on new motor vehicles, or as replacement parts, that are sold in this state shall obtain certification from a third-party testing certification agency that each of their formulations for brake friction materials complies with Sections 25250.52 and 25250.54. A certification shall be valid for no more than three years. Manufacturers shall mark proof of certification on all brake friction materials.

(c) Prior to its products being sold in this state, a manufacturer of friction materials used in brakes on new motor vehicles, or as replacement parts, shall file a copy of the third-party certification of each of its brake friction materials formulations with the department. The department shall charge a reasonable filing fee upon the filing of a copy.

(d) Manufacturers of friction materials used for brakes on new motor vehicles, or as replacement parts, may obtain certification of compliance with the requirements of Section 25250.52 or ~~Section~~ 25250.54 at any time prior to the dates specified in those sections.

(e) The department, in consultation with all interested parties, and on or before January 1, 2012, shall develop all certification and marking criteria required pursuant to this section.

(f) Commencing on January 1, 2014, vehicle manufacturers and retailers of friction materials shall ensure that only brakes certified for sale in this state are offered for sale in this state.

25250.62. (a) A violation of this article, including, but not limited to, offering brake friction materials for sale without first complying with subdivision (c) of Section 25250.60 or the falsification of third-party certification, by vehicle manufacturers, brake friction materials manufacturers, distributors, or retailers,

shall be subject to a civil fine of up to ten thousand dollars ($10,000) per violation.

(b) The department shall enforce this article. The department shall remove from sale in this state any replacement brake friction materials determined to be not in compliance with this article.

(c) In enforcing this article, the department shall not recall automobiles fitted with brake friction materials that do not comply with this article, but the department may impose fines and penalties authorized pursuant to subdivision (a) on automobile manufacturers whose vehicles are fitted with brake friction materials that do not comply with this article.

25250.64. This article does not limit, supersede, duplicate, or otherwise conflict with the authority of the department to fully implement Article 14 (commencing with Section 25251), including the authority to include products in a product registry established pursuant to the regulations adopted pursuant to that article or any testing or labeling requirements imposed pursuant to that article if those requirements are more protective of the public health and environment than those prescribed by this article. Notwithstanding subdivision (c) of Section 25257.1, vehicle brake pads shall not be considered as a product category already regulated or subject to pending regulation for purposes of Article 14 (commencing with Section 25251).

SEC. 3. No reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution because the only costs that may be incurred by a local agency or school district will be incurred because this act creates a new crime or infraction, eliminates a crime or infraction, or changes the penalty for a crime or infraction, within the meaning of Section 17556 of the Government Code, or changes the definition of a crime within the meaning of Section 6 of Article XIII B of the California Constitution.

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Reducing Water Pollution Caused by Vehicle Brake Pads

Brake Pad Copper Control and Total Maximum Daily Loads

- Copper from vehicle brake pads is polluting California's urban waterways.
- There are limited options for intercepting or treating copper pollution.

As of 2006, 51 water bodies across California exceeded the amount for copper allowed under state and federal regulations. The vast majority of this copper comes from vehicle brake pads.

Local agencies, especially financially strapped cities like San Diego, Los Angeles, Sacramento, and San Francisco Bay Area cities, are being forced to deal with this pollution under the U.S. Environmental Protection Agency's Total Maximum Daily Load (TMDL) mandates imposed through regional water quality control boards.

Several municipalities are already facing aggressive TMDL requirements and deadlines for achieving drastic reductions in copper pollution in 18 specific water bodies. Similar requirements are being drafted and are soon expected for all of California's urban areas.

Carefully Crafted Regulation is Imperative

Senator Christine Kehoe has proposed Senate Bill (SB) 346 that would phase out the use of copper in motor vehicle brake pads and would also limit the use of other harmful water pollutants such as lead, mercury, zinc, cadmium and asbestos in brake pads.

- Senator Kehoe's bill is essential for municipal agencies facing tough copper TMDL requirements.

Costly infiltration basins and land-use intensive vegetated strips and swales are the only runoff treatment measures that can remove sufficient amounts of copper to comply with copper TMDLs. High costs and the very large land areas required make these options rarely available in California's highly urbanized areas. As a result, **treating runoff to remove copper is many times more expensive than treatment for other pollutants.** Installing urban runoff copper treatment measures like these would cost California municipalities billions of dollars. Regulating copper content in brake pads is a better and safer alternative.

The Cost of Waiting is Just Too Great

- Any delay in adopting or implementing SB 346 will put municipal agencies at risk.

Unless brake pad copper pollution reduction begins soon, non-compliance with TMDL requirements will be unavoidable. The potential fines for non-compliance are staggering, and many regional water quality control boards have shown a willingness to impose them if they believe no meaningful effort is being made to comply. The risk to municipalities is real – and not one they are willing to take.

Vehicle brake pads are the single largest source of copper in highly urbanized watersheds in California. To achieve compliance with Total Maximum Daily Loads (TMDLs), significant reductions in copper concentrations must occur. Compliance with TMDLs cannot be achieved without the brake pad source control proposed by Senator Kehoe.

SB 346 Protects Residents and Industry

Municipalities have been working for years to encourage manufacturers and other automotive industry leaders to reduce and eventually eliminate copper from brake pads. Those discussions have been productive but have fallen short of any substantive agreement regarding the timelines and leadership necessary to reduce brake pad copper pollution.

SB 346 is necessary to move this critical effort forward.

Domestic and international competition will undercut any attempt to voluntarily reduce copper in brake pads. Manufacturers would be left without the incentives to take advantage of alternative brake pad formulations. Protecting our watersheds from copper pollution through regulated source reduction is the only technically feasible and fiscally responsible solution. Regulation will ensure that source reduction is initiated in a timely fashion.

Display of brake pads

Senator Kehoe's bill:

- **Levels the playing field between all domestic and foreign manufacturers;**
- **Provides cost-effective means for improving water quality and avoiding far more costly treatment alternatives; and**
- **Is the only realistic and fair solution to a complicated threat to our state's water quality.**

Lobbyist Contact: Moira Topp, City of San Diego Legislative Advocate, Sloat Higgins Jensen & Associates (916) 446-3007 or mtopp@shjlobby.com

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FACT SHEET
SB 346 (KEHOE) – Hazardous materials: motor vehicle brake friction materials
As amended June 7, 2010

PROBLEM: Elevated copper levels occur in urban watersheds across California. Dissolved copper is toxic to phytoplankton (the base of the aquatic food chain). It also impairs salmon's ability to avoid predators and return to their home streams to spawn. Scientific studies have shown that the primary source of copper in highly urbanized watersheds is the fine dust generated by the use of vehicle brake pads.

Pursuant to the requirements of the federal Clean Water Act, the Regional Water Quality Control Boards in Los Angeles and San Diego have already imposed severe copper Total Maximum Daily Loads (TMDLs). Similar TMDLs are expected to be imposed on other urban watersheds across the state in the near future. The only technically and economically feasible way for municipalities to comply with these TMDLs is to eliminate copper pollution at its source – vehicle brake pads – no later than 2025. Any attempt to try and remove copper already dissolved in stormwater in highly urbanized areas would most likely require condemnation of large tracts of land and construction of elaborate infrastructure and cost already fiscally strapped local governments billions of dollars statewide with no guarantee that these methods would actually succeed.

SOLUTION: SB 346 would require brake pad manufacturers to reduce the use of copper in brake pads sold in California to no more than 0.5% by 2025. The bill also: 1) creates limits for other brake pad materials, 2) establishes a certification process by a third-party testing agency for compliance and requires the Department of Toxic Substances Control (DTSC) to charge a fee to cover the costs; 4) establishes civil penalties for violations; and 5) creates a Brake Friction Materials Water Pollution Fund into which any fines, penalties, and fees would be deposited. Funds collected would be used to implement the bill, upon appropriation by the Legislature. The goal is to improve California's water quality and allow California stormwater agencies to meet their TMDLs in a timeframe that is aggressive but realistic for brake and vehicle manufacturers.

BACKGROUND INFORMATION:

The bill is sponsored by the City of San Diego and Sustainable Conservation, and is the result of a 15-year effort to understand and address the impact on the environment of brake pad wear debris generated during the use of motor vehicles. A series of interlinked, peer-reviewed laboratory, environmental monitoring, and environmental modeling studies established that brake pads are by far the most significant source of copper in runoff from urban watersheds. Details of these studies can be found at www.suscon.org/brakepad.

SB 346 provides industry with a generous timeline within which to develop and distribute safe and effective copper-free brake friction materials, gives cities and counties the ability to demonstrate that they will meet their copper TMDLs in a timely manner, and removes a serious threat to the health of salmon and other aquatic life in California's urban watersheds.

For further information, please contact Linda Barr at (916) 651-4477 or by email at linda.barr@sen.ca.gov., or Justin Malan at (916) 448-1015 or by email at Justin@ecoconsult.biz.

Supporters:

Sustainable Conservation (co-sponsor)
City of San Diego (co-sponsor)
California Stormwater Quality Association
TDC Environmental
Coalition for Practical Regulation (representing 40 cities)
League of California Cities
Bay Area Stormwater Management Agencies Association (representing 84 cities and 7 counties)
California State Association of Counties
San Diego Coastkeeper
UC San Diego
Port of San Diego
U.S. Navy
Environmental Entrepreneurs
Sierra Club California
Natural Resources Defense Council
Center for Environmental Health
California Association of Environmental Health Administrators
California Product Stewardship Council
Forests Forever
Heal the Bay
Clean Water Action
Planning and Conservation League
California League of Conservation Voters
StopWaste.Org
City of Signal Hill
City of Lynwood
City of Carson
City of Whittier
City of Downey
City of Cerritos
City of Vista
City of Torrance
Los Angeles County Flood Control District
City of Arcadia
City of Los Angeles
City of Rolling Hills
City of Vernon
Ventura Countywide Stormwater Quality Management Program
City of Duarte
City of Sante Fe Springs
City of Lakewood
City of Camarillo
Coastal Environmental Rights Foundation
City of Commerce

Supporters:

City of Covina
Industrial Environmental Association
City of San Jose
City of Thousand Oaks
City of Monterey Park
City of Bellflower
City of Paramount
City and County of San Francisco
Alameda County Board of Supervisors
Ventura County Board of Supervisors
City of Santa Marina
City of Long Beach
City of Ventura

MRP Regional Supplement for POCs and Monitoring
Appendix A

A16

Alameda Countywide
Clean Water Program

Contra Costa
Clean Water Program

Fairfield-Suisun
Urban Runoff
Management Program

Marin County
Stormwater Pollution
Prevention Program

Napa County
Stormwater Pollution
Prevention Program

San Mateo Countywide
Water Pollution
Prevention Program

Santa Clara Valley
Urban Runoff Pollution
Prevention Program

Sonoma County
Water Agency

Vallejo Sanitation
and Flood
Control District

B A S M A A

June 3, 2010

The Honorable Pedro Nava
Chair, Assembly Committee on Environmental Safety & Toxic Materials
State Capitol, Room 2148
Sacramento, CA 95814

Subject: SB 346 (Kehoe) – Source Control of Copper Water Pollution – Support As Proposed To Be Amended

Dear Assemblymember Nava:

The Bay Area Stormwater Management Agencies Association (BASMAA)[1] strongly supports SB 346 (Kehoe), which will provide California's cities and counties with the tool they need to comply with stringent federal and state water quality mandates and avoid billions of dollars in costs and penalties. SB 346 requires that copper, an extremely significant aquatic pollutant, be reduced to a *de minimis* 0.5% by weight in vehicle brake pads sold in California by 2025. Peer-reviewed scientific studies have established that by far the most significant source of copper in urban watersheds is the fine dust generated from the use of brake pads.

Pursuant to the requirements of the federal Clean Water Act, the Regional Water Quality Control Boards in Los Angeles and San Diego have already imposed severe copper Total Maximum Daily Loads (TMDLs). Similar TMDLs are expected to be imposed on other urban watersheds across the state in the near future. The only technically and economically feasible way for municipalities to comply with these looming deadlines is to eliminate copper pollution at its source – vehicle brake pads – no later than 2025. Any attempt to try and remove copper already dissolved in stormwater in highly urbanized areas would most likely require condemnation of large tracts of land and construction of elaborate infrastructure. This could easily cost already fiscally strapped local governments billions of dollars statewide with no guarantee that these methods would actually succeed.

SB 346 provides industry with a generous timeline within which to develop and distribute safe and effective copper-free brake friction materials while also giving cities and counties the ability to demonstrate that they will meet their copper TMDLs in a timely manner without having to spend billions of dollars to do so. BASMAA and its 96 member agencies are pleased to support SB 346.

Very truly yours,

James Scanlin

James Scanlin, Chair
Bay Area Stormwater Management Agencies Association

cc: Senator Christine Kehoe
Assemblymember Ira Ruskin

Bay Area
Stormwater Management
Agencies Association
P.O. Box 2385
Menlo Park, CA 94026
510.622.2326
info@basmaa.org

[1] BASMAA is a consortium of nine municipal stormwater programs in the San Francisco Bay Area representing 96 agencies, including 84 cities and 7 counties. The members of BASMAA are responsible for complying with the requirements of municipal separate storm sewer system (MS4) National Pollutant Discharge Elimination System (NPDES) permits issued by the San Francisco Bay Regional Water Quality Control Board (Water Board).

MRP Regional Supplement for POCs and Monitoring
Appendix A

A17

Impact of dissolved copper on the olfactory system of seawater-phase juvenile salmon

Estimated cost: **$36,767**

Oversight Group: Exposure and Effects Workgroup

Proposed by: David Baldwin, Environmental Conservation Division, NOAA Northwest Fisheries Science Center

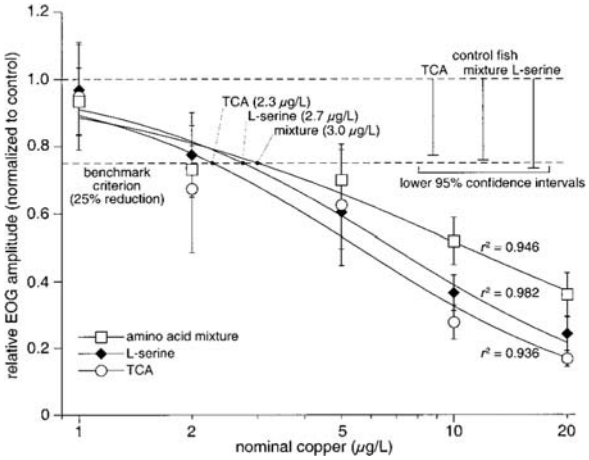
PROPOSED DELIVERABLES AND TIMELINE

Setup, exposures, electrophysiological recordings, and data analysis	June – Sept, 2011
Preparation of report	Sept – Nov, 2011

BACKGROUND

Copper is a ubiquitous contaminant of aquatic systems in urbanized and agricultural areas. In the San Francisco Bay estuary, elevated ambient copper concentrations result from a multitude of anthropogenic sources including, in decreasing order, erosion of buried sediments, inflow from the Sacramento and San Joaquin Rivers, urban and non-urban runoff, anti-fouling marine coatings, urban wastewater, atmospheric deposition, and industrial discharge (CRWQB 2007). Although the source of copper entering the Bay from the Sacramento and San Joaquin Rivers has not been assessed, one possible source is the application of copper-containing pesticides (data available online from the California Department of Pesticide Regulation Pesticide Use Reporting Program www.cdpr.ca.gov/docs/pur/purmain.htm).

In fish, exposures to dissolved copper concentrations that are sublethal are, nonetheless, known to be able to impair peripheral sensory systems (e.g. gustation, mechanosensation, and olfaction). For example, freshwater studies have shown that copper is toxic to fish mechanosensory (Hernandez et al. 2006; Linbo et al. 2006) and olfactory (Hansen et al. 1996; Baldwin et al. 2003) receptor neurons. Furthermore, inhibition of olfactory function is highly correlated with reduced ability to respond to an olfactory alarm cue that triggers anti-predation behavior in juvenile coho salmon (*Oncorhynchus kisutch*, Sandahl et al. 2007). In experiments with predatory cutthroat trout (*Oncorhynchus clarki*), survival of juvenile coho salmon was reduced 3- to 5-fold (McIntyre et al. in prep.). Significantly, these effects on the olfactory system can occur following exposure periods of as little as 30 minutes and increases in dissolved copper concentrations of as little as 3 µg/L (e.g. Baldwin et al. 2003; see Figure).



Dose-response curves and threshold determination for sub-lethal copper olfactory toxicity. Olfactory responses to three different odors were reduced following 30-minute increases in copper. Figure 5 from Baldwin et al. (2003).

Current site-specific copper objectives (SSOs) for San Francisco Bay were derived, in large part, from 96-hour tests on the development of larval *Mytilus edulis*. As per EPA guidance, toxicity tests in site water and standard laboratory waters were compared to account for the local influence of water chemistry on the bioavailability of copper to

relevant ligands in this organism. When considering copper neurotoxicity to peripheral sensory systems of sensitive fish taxa, it is important to realize that water chemistry may not have the same influence as on the development of larval *Mytilus edulis*. In tests on peripheral sensory systems in freshwater fishes, hardness and alkalinity provided little to no protection from copper neurotoxicity (McIntyre et al. 2008; Linbo et al. 2009). This differs from the conventional understanding of the influence of water quality on copper toxicity derived from the Biotic Ligand Model (BLM). Dissolved organic matter (DOC) provided some protection against copper neurotoxicity, but not to the extent expected from BLM-based predictions. These results are likely because the copper dynamics modeled by the BLM are based on interactions with ligands at the fish gill, not at sensory epithelia.

Currently, the copper SSOs are higher than concentrations at which effects on olfactory neurophysiology (Baldwin et al. 2003) and behaviour (Sandahl et al. 2007; McIntyre et al. in prep.) were seen in juvenile coho salmon. However, studies on copper neurotoxicity to peripheral sensory systems have thus far been conducted exclusively in freshwater. Given the uncertainty about the protectiveness of seawater from copper olfactory neurotoxicity, it is difficult to extrapolate effects thresholds to the different water chemistry of marine and estuarine waters. Additionally, differences between the biology of freshwater-phase versus seawater-phase juvenile salmon produce another source of uncertainty. The goal of this study is to determine the impacts of dissolved copper of the olfactory system of seawater-phase juvenile salmon in order to compare these effects to those known for freshwater-phase juvenile salmon and the copper SSOs for the San Francisco Bay estuary.

APPLICABLE RMP OBJECTIVES AND MANAGEMENT QUESTIONS

4.3 What ecological risks are caused by pollutants of concern? This study will determine what levels of dissolved copper pose a risk to the olfactory system of seawater-phase juvenile salmon.

4.6 Which forms of pollutants cause impairment? In addition to being present as free copper ions (Cu^{2+}), dissolved copper will form complexes (i.e. species) with other constituents of water (e.g. hydroxyl ions, carbonates, and dissolved organic molecules). These other species are considered to be much less toxic with respect to acute mortality and development. However, some of them may still be toxic to the olfactory system. The ability of seawater to form copper complexes, therefore, may provide less protection to the olfactory system of salmon than expected based on acute mortality.

5.1 What percentage of the Estuary is supporting beneficial uses? This study will address whether copper SSOs are likely to protect the olfactory system of juvenile salmon in the SF Bay estuary from sublethal impairment.

APPROACH AND OBJECTIVE

This study will be based on previous NOAA studies that measured copper olfactory toxicity in freshwater-phase juvenile salmon (Baldwin et al. 2003; Sandahl et al. 2007; McIntyre et al. 2008). As was done in these previous studies, the impact of copper exposure on the sensitivity of the salmon olfactory system to odors will be measured using direct electrophysiological recordings (electroolfactograms; EOGs) from the olfactory epithelium (Baldwin et al. 2003). While the effect of copper on the EOGs of seawater-phase salmon has not been measured, the methods have been adapted to record EOGs in seawater-phase cutthroat trout (Labenia et al. 2007). The experiments will be performed at the Northwest Fisheries Science Center's (NWFSC) Mukilteo Field Station (Mukilteo, WA) using Chinook salmon (*Oncorhynchus tshawytscha*). Fertilized eggs will be obtained from a local hatchery and reared in freshwater at Mukilteo until fish are the appropriate age for smolting. The majority of the fish will then be transitioned to seawater and maintained in seawater for the duration of the experiment, while a subset will remain housed in freshwater. Water samples will be collected for analyses of water chemistry parameters (e.g. salinity and DOC) and copper concentrations.

Determine the threshold for effects of dissolved copper on the olfactory system of seawater-phase juvenile salmon. The proposed studies are expected to be initiated in June 2011 and should be complete by the end of the fiscal year (October 2011). To determine the effect of copper on the olfactory system, odor-evoked EOGs will be obtained from fish using a standard odorant, the amino acid L-serine. Fish will be either unexposed to copper (controls) or exposed for a short period (30 minutes) to one of at least 3 copper concentrations (ranging from 2-20 µg/L, but higher if needed). Copper-induced changes in the sensitivity of the olfactory system will be measured as a dose-dependent reduction in the amplitude of the odor-evoked EOGs from which an effect threshold for copper can be determined (e.g. see figure above). While the focus of the EOG recordings will be on seawater-phase juvenile Chinook salmon, fish that weren't smolted will be available, if necessary, to confirm the impact of copper on the olfactory system of freshwater-phase Chinook.

Since DOC is known to affect the toxicity of copper to the olfactory system (McIntyre et al. 2008), exposures will be performed at three different DOC concentrations representative of the SF Bay (e.g. 2, 4, and 6 mg/L). To the extent possible, the source of DOC used to amend the local seawater (which is ~2 mg/L DOC) will have copper binding properties similar to that of DOC from the SF estuary. The aim of the study will be to determine the effects threshold for the olfactory toxicity of copper in seawater-phase juvenile salmon at various DOC concentrations in order to compare this with thresholds measured from freshwater-phase salmon and with the copper SSOs in the SF Bay estuary.

REQUESTED BUDGET:

Biological Technician contractor salary (4 months)	$19,767
Equipment	$6,000
Supplies	$3,000
Travel	$2,000
Copper and water analyses	$6,000
Total	**$36,767**

NOAA contributions will include fish, fish husbandry, additional equipment and salary support (e.g. technicians and PI).

Cited literature:

Baldwin, D. H., J. F. Sandahl, J. S. Labenia, and N. L. Scholz. 2003. Sublethal effects of copper on coho salmon: Impacts on nonoverlapping receptor pathways in the peripheral olfactory nervous system. Environmental Toxicology and Chemistry **22**:2266-2274.

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Appendix B

MRP Regional Supplement for POCs and Monitoring
Appendix B

B1

DRAFT
BASMAA REGIONAL MONITORING COALITION
MULTI-YEAR WORK PLAN

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Contributions from "Stormwater" Programs to the RMP in 2009 and 2010

Program/Agency	2009	2010
Santa Clara Valley Urban Runoff Pollution Prevention Program	$170,327	$173,820
Alameda Countywide Clean Water Program	$165,376	$168,561
Contra Costa Clean Water Program	$134,023	$136,589
San Mateo Countywide Water Pollution Prevention Program	$82,030	$83,603
Marin Countywide Stormwater Pollution Prevention Program	$54,546	$55,557
Vallejo Sanitation and Flood Control District	$12,683	$12,864
Fairfield-Suisun Urban Runoff Management Program	$14,569	$14,803
City and County of San Francisco[a]	$37,592	$38,773
Caltrans[a]	$74,572	$76,063

[a]Although contributors to the RMP under the umbrella category of "stormwater", during FY 2009-10 these entities were not members of BASMAA or subject to the MRP.

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B3

RMP
Small Tributaries Loading Strategy

SFEI Contribution #585

This report should be cited as:
San Francisco Estuary Institute, (SFEI) 2009. RMP Small Tributaries Loading Strategy. SFEI Contribution #585. San Francisco Estuary Institute, Oakland, CA.

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Introduction

The overarching goal of the RMP, and the intent of the Small Tributaries Loading Strategy (STLS), is to provide information needed to support water quality management decisions. The STLS was developed to ensure that the RMP is providing the information most urgently needed by managers to reduce loads and impacts of pollutants of concern (POC) entering the Bay from small tributaries.

The objective of this document is to present a planning framework for small tributary loads monitoring within the RMP that is consistent with and complemented by monitoring that will be completed in compliance with the Municipal Regional Permit for stormwater agencies (MRP). Water Board staff have affirmed that MRP provisions relating to POC and sediment loads monitoring would be revised to be compatible with the final version of this *Strategy*. Ideally, the strategy will be incorporated into the permit requirements so that coordination between BASMAA efforts and RMP efforts can be achieved. If the MRP development process is completed after development of this *Strategy*, the methods and studies outlined in this *Strategy* can be incorporated in the MRP language by reference. Implementing this *Strategy* will also consistent with the other RMP Strategies (Mercury, Dioxins, Modeling, and PCBs). These linkages are highlighted throughout.

Small tributaries have been identified in the mercury and PCB TMDLs as contributing significant and controllable loads of pollutants to San Francisco Bay. While mercury, methylmercury and PCBs remain the top priority and the focus of the majority of resources, the Sources Pathways and Loadings Workgroup (SPLWG) has ranked PBDEs as a high priority, and pyrethroids, dioxins (see the *RMP Dioxin Strategy*), selenium, OC pesticides, copper, nickel, and PAHs as medium priority for loads information. There are additional analytes listed in the February 2009 draft tentative order of the MRP that will also be considered (Category 1: Cu_D, POC; Category 2: Se_T, Se_D, NOx, total P and phosphate (PO_4^{3-}). In addition, it is recognized this POC list might evolve year-to-year as more information is gained through, for example, the emerging contaminants workgroup (ECWG) of the RMP. For all these POCs there remain uncertainties in:

- the magnitude of total regional loads,
- which watersheds contribute disproportionately to loads and impacts on local and regional scales,
- the relative importance of atmospheric deposition versus local sources contributing to watershed loads,
- how management can reduce loads, and
- trends in loads.

A premise of this *Strategy* is that it is possible to identify small tributaries that exert a disproportionately large influence on loads and impacts (consistent with the PCB and Hg strategies). Older industrial areas in local watersheds are presently hypothesized to be more polluted with PCBs than other parts of the urban landscape, whereas for

mercury, a broader distribution is hypothesized that includes industrial and commercial areas with higher imperviousness, and older urban areas. This more even distribution is partly because regionally it is estimated that about one third of the mercury load in urban stormwater is derived from atmospheric deposition. An additional premise of this *Strategy* is that the process of identification of sources and control of Hg and PCBs will also help to control other particle bound POCs. If these premises are correct, it will be possible to focus attention on contaminated tributaries and areas within watersheds and reduce mercury, PCB and other POC loads to the Bay and ultimately reduce beneficial use impacts in a cost-effective manner.

The RMP has already conducted loads monitoring for mercury, PCBs, and other POCs in three tributaries (Sacramento River, Guadalupe River, and Zone 4 Line A, a small tributary in Hayward). This *Strategy* aims to build on existing efforts and increase the amount and cost-effectiveness of information generated to answer key management questions while at the same time coordinating with BASMAA studies in relation to MRP compliance.

Management Questions and Priorities

1) Impairment

Which are the "high-leverage" small tributaries that contribute or potentially contribute most to Bay impairment by pollutants of concern?

An understanding of the POC load contributions of individual watersheds to impairment will be essential to developing cost-effective strategies for reducing loads and monitoring progress in load reductions in the context of sensitive areas on the Bay margin and food web uptake. This question ties closely with the *RMP Mercury and PCB Strategies* which identify the need to determine which processes, sources, and pathways disproportionately contribute to food web accumulation. It is anticipated that a focus on linking loads to impairment will help ensure that load reductions actually lead to reductions in exposure and impacts in target species. Implicitly, to answer this question, information will needed that links concentrations or loads from watersheds with key biological processes in the near-field habitats on Bay margin. Before that can be done however, we must first make decisions about which watersheds to study using a ranking derived from the combination of all available information on POC sources, atmospheric deposition, sediment concentrations in stormwater conveyances, and POCs in Bay margin sediment and biota.

2) Loads

What are the loads or concentrations of pollutants of concern from small tributaries to the Bay?

The TMDLs for mercury and PCBs include an allocation for the aggregate loads from urban stormwater runoff. Data collected in compliance of provision C.8.f of the MRP will inform improved measurements of single watershed loads and regional estimates. While load information will be developed for single watersheds, we are emphasizing understanding loading and impairment at the regional scale. This information will be

useful for input into models of the Bay process and recovery time (see the *RMP Modeling Strategy*). A combination of field studies and modeling will be needed to answer this question. There are a few key intermediate questions to be answered. For example, what sampling design is needed (how many samples under what kind of field conditions should be taken to generate loads information)? How many categories of watersheds are there in the Bay Area? How many watersheds in each category should be studied? Which categories should be prioritized for collection sooner than others? What sampling design is needed to characterize loads associated within each watershed category? Although Hg and PCBs are the most urgent and data rich POCs to build a framework of investigation from, like all other components of this *Strategy*, it is assumed that there will be benefits for other POCs.

3) Trends

How are loads or concentrations of pollutants of concern from small tributaries changing on a decadal scale?

Understanding long-term trends in loads is essential to tracking progress toward TMDL wasteload allocations. Provision C.8.d and C.8.f of the MRP describe the intent to track trends through water quality sampling in urban stormwater. Answering this question will require the collection of systematic data in fixed locations. Power analysis will be needed to determine the amount of data needed to see a trend of a given magnitude given reasonable expectations of management effort and environmental variability.

4) Support for Management Actions

What are the projected impacts of management actions on loads or concentrations of pollutants of concern from the high-leverage small tributaries and where should management actions be implemented in the region to have the greatest impact?

Answering this question will require conceptual, and ideally quantitative models of the behavior of POCs in the watersheds, along with an adequate foundation of empirical information (see the *RMP Modeling Strategy (Question 4*)). Data will be needed to populate the internal structure of the models (for example concentrations and loads of POCs associated with land use or source categories) as well as for calibration and verification (e.g., single location time continuous flow and concentration data). In addition to model input data, information on anticipated management actions will be needed: when, where, and what?

Guiding Principles

- Focus on what should be done, rather than what can be done. Implement control measures where they are most likely to impact Bay water quality impairments.
- Seek opportunities for obtaining information on multiple pollutants in a cost-effective manner (e.g., piggybacking).
- Seek areas where collaboration can be maximized.

Definitions

- Small tributary: Rivers, creeks, and storm drains that enter the Bay downstream of the confluence of the Sacramento and San Joaquin rivers.
- Pollutants of concern (POC): Use SPLWG prioritized list and the list provided in provision C.8.f of the MRP and apply budget disproportionately to higher ranked POCs.

Implementation of the STLS

The largest challenge that is unique to the STLS in contrast to the other RMP strategies is the close coordination with the monitoring components in the MRP. We envisage the need for a consensus between the RMP Steering Committee, the Water Board, and BASMAA on which parts of the STLS will fulfill permit requirements and what kind of reporting will be needed by the STLS team in that regard. This decision will provide the general conceptual framework for partitioning activities between RMP work and BASMAA work under the MRP. Although conceptually there will be a need each year to review that decision and alter it as needed, the success of this *Strategy* and the resulting program of observation and information development will be largely reliant on consistency and predictability for staffing and equipment.

Like any planning document, this *Strategy* will require periodic updating as management needs evolve and questions are answered or new questions are generated. In addition, stakeholders are interested in periodic reports that synthesize the data and information developed as a WHOLE. Lastly, stakeholder meetings will be required periodically to inform interested parties of results and make adjustments to the field components of the strategy.

Proposed Tasks to Answer the Management Questions

Task 1: Guadalupe River Model

Funded in 2008 and 2009 - $150,000 over two years. Proposed funding 2011 - $75,000

In 2009 the RMP funded the 2nd year of a two year modeling effort in the data rich Guadalupe River Watershed as a first step towards developing a regional scale model. Guadalupe was chosen because of the abundance of rainfall and runoff data collected by the SCVWD, the abundance of Hg sediment data collected by a number of agencies beginning 1988, and the abundance of suspended sediment and bed load data collected by the USGS. In addition, the RMP/CEP/SCVWD/SCVURPPP has funded SFEI to collect 4 years of Hg, PCB and other POC data during storms. While the model may have local stakeholder uses, the overall intention is to use Guadalupe as a starting point for the development of other watershed models and ultimately a regional scale model. In 2011, the model will be rerun to answer questions like:

- Long term average loads (*Strategy* Question 2)
- Predicting the effects of various BMP scenarios (*Strategy* Question 4)
- Predicting the time to observe trends (Note this would help to refine the sampling plan (Task 3))

Year 1 – Model stormwater flow (Lent and Oram, 2009)
Year 2 – Model suspended sediment, Hg, and PCBs
Year 3 – Model BMPs and loads trends.

Objectives: Improve load estimates for Guadalupe River, develop and calibrate a model for testing BMP scenarios and predicting load trends, and provide tested parameterization of the model to expand the use to other watersheds in the regional context.

Task 2: Z4LA Small Tributaries Loading Study
Funded Water Years 2007, 2008, 2009 - $400,000 over three years.

Beginning in 2007, the RMP funded a second small tributaries loading study in a small urban watershed in Hayward. The intent of this study was to understand loads of POCs entering the Bay from a small industrialized tributary near the Bay margin. This watershed was chosen because it contrasts with Guadalupe River in size, land use, rainfall variation, soil types, and location on the Bay margin. The study uses an intensive single station design employing 5 minute interval stage, rainfall, and turbidity measurement and storm focused ISCO pump sampling and depth-integrated point sampling. So far this study has been funded for three relatively dry years. Preliminary comparisons to Guadalupe reveal similarity of most POC loads normalized to areas during dry years with the exception of Hg, Cr, and Ni which have greater concentrations and loads in the Guadalupe system most likely due to historic mining.

Objective: Improve regional loads estimates for the class of smaller industrial watersheds near the Bay margin.

Task 3: Develop Multi-Year Watershed Loading Sampling Plan
Funded 2009 - $10,000

In order to cost effectively and systematically gather data to answer the *Strategy* questions, a multi-year sampling plan is needed to guide both the RMP and MRP data collection efforts. The aim of this task is to provide the rationale and plan for sampling to address the Strategy questions. This document will have strong linkages to provision C.8.d and C.8.f of the MRP. The sampling plan will need to be updated periodically as management needs change.

Three subtasks will contribute to development of the sampling plan. The sampling plan will reflect the present consensus obtained through ongoing discussions between the Water Board and BASMAA with scientific advisory input.

Objective: Write a sampling plan for small tributaries loads that represents consensus and guides RMP and MRP studies over the next 3-5 years.

Task 3a: Develop Criteria and Rank Watersheds
Funded 2009 - $25,000

The premise of the STLS is that it is possible to identify tributaries where there are controllable sources that exert a disproportionately large influence on loads and impacts. Two key questions in relation to this *Strategy*, and before the Water Board and BASMAA in relation to the MRP, are how many types of watersheds do we have and how many watersheds should be studied to answer the key management questions? A key long-standing recommendation of the SPLWG is to stratify watersheds into broad categories and then to sample one or two watersheds in each category; however due to budget limitations this has never been done. To answer these questions, a list of "representative watersheds" or which in the past have been called "observation watersheds" (Davis et al., 2000) or which in southern California are called "mass emissions sites" (Tiefenthaler et al., 2008) needs to be developed. Data on concentrations in Bay sediment, water, and tissue will be used along with physical parameters such as water depth and circulation patterns to characterize and rank Bay margins. To characterize and rank watersheds, information on PCB and Hg sources and "emission factors" and low and high flow hydrology and loads (McKee and Gilbreath in preparation) will be combined with recent new estimates of watershed specific sediment loads (Lewicki and McKee et al., 2009) to provide hypotheses of sediment concentrations. A weight-of-evidence approach will be used during the ranking process, along with knowledge of opportunities for collaboration, and benefits for multiple pollutants.

Objective: To develop a list of representative watersheds for focused study.

Task 3b: Optimize Sampling Methods for Loadings and Trends
Funded 2009 - $45,000

Management questions and associated hypotheses that are tested by environmental field data require an appropriate field sampling design that is cost effective and achieves the desired outcomes with appropriate confidence. Over the past eight years the SPLWG has implemented loads studies at Mallard Island, the Guadalupe River, and Zone 4 Line A with the objective of increasing our understanding of the sources and processes of sediment and pollutant transport and calculating accurate and precise loads of particle associated POCs. Given increasing costs, the need to estimate loads at more locations in any given year, and the need to show trends (over 5 or more years) as one tool for evaluating whether the TMDL objectives are being met (see provision C.8.f of the February 2009 draft tentative order of the Municipal Regional Permit (MRP)), there is a clear need to evaluate our sampling design and reformulate it as necessary. Using data collected at the three existing load stations, an analysis will be performed to assess the optimal number of samples and style of sampling coupled with loads calculation techniques for assessing loads and determining trends. Methods

similar to those outlined in published works (Leecaster et al., 2002; Ma et al., 2009) will be used. We will also make a cost analysis of each combination so that local managers can assess accuracy versus cost. The simulated sampling techniques will be decided during review of a work plan or, if needed, at a special subcommittee meeting of the SPLWG.

Objective: To determine the optimal sampling design for both loads monitoring and trends detection.

Task 3c: Develop Spreadsheet Model for Regional Loadings Estimates
Proposed funding 2010 - $35,000, $10,000 each year thereafter

"Spreadsheet models" provide a useful and inexpensive tool for organizing data to estimate regional scale watershed loads, our second key management question. They are based on the simplifying assumption that unit area runoff for homogeneous sub-catchments has constant concentrations and thus have advantages over models such as HSPF and SWMM that require large calibration data sets which take money and time to collect. Such a model was developed for the Bay Area previously (Davis et al., 2000) however, at that time, there was only local land use specific data on POCs for a drought period late 1980s and early 1990s, and there were no data on Hg and PCBs. In this task, a GIS based "spreadsheet model" will be developed using more recent local data on land use based concentrations and mass emissions collected in the Bay Area (augmented using recent stormwater literature) and updated annually as more and more data becomes available through implementation of this *Strategy*. The model structure will be based on the published work by Ha and Stenstrom (2008) and is more sophisticated than the SIMPLE model used by Davis et al (2000) because it contains calibration steps.

Objective: Develop a calibrated tool to make regional scale loads estimates of current and future POCs that can be updated annually as new information is developed.

Task 4: Pollutants of Concern Monitoring at a Subset of Representative Watersheds
Proposed funding 2011, 2012, 2013, 2014, and 2015 - $250,000 per year

Provision c.8.f of the revised tentative order of the MRP (February 2009) calls for monitoring to assess inputs of POCs to the Bay from specific local tributaries and urban runoff, to assess progress toward achieving wasteload allocations (WLAs) for TMDLs, and for helping to resolve uncertainties associated with loads estimates for POCs at the regional scale (whole Bay). The objective of this task is to carry out monitoring that achieves these same goals, and addresses *Strategy* questions 1 and 2. An efficient approach to conducting this monitoring will be developed through SPLWG discussions and guided by the multiyear watershed sampling plan (Task 3). With an efficient approach, it should be possible to establish three small tributaries load monitoring stations at a $250,000 / year level of funding but the cost estimate will necessarily be refined after the completion of Task 3b (above). The locations would be decided through

consultation with BASMAA and the Water Board and based partly on Task 3a (Develop criteria and rank watersheds). In year 1, we would install discharge and sediment monitoring equipment at three locations and begin sampling. In year two, the majority of the funds would be applied to collecting field data when all the start up costs would have been expended in the first year. Technical reports would be written in year 3 and year 5 only, to minimize reporting costs.

Objective: Determine loads entering the Bay from representative watersheds and improve regional loads estimates.

Task 4a: Pollutants of Concern Monitoring (Guadalupe River)
Proposed funding 2010 - $43,000. 2013 - $65,000 (if selected for ongoing monitoring)

Data collected previously in the Guadalupe River Watershed left a number of unanswered questions and hypotheses. During the first sampling year, a 1:5 year return storm event occurred. From December 16th 2002 mercury concentrations were elevated for the remainder of the WY. The data supported a number of hypotheses about the causes of high concentrations but the watershed was never sampled under similar conditions. Additionally, the original sampling design did not allow an estimate of Hg or PCBs from urban sources alone. In response to remaining unanswered questions and also the need to carry out systematic repeated sampling to assess trends, the RMP has budgeted funding for sampling every three years. Recently, the RMP began modeling Guadalupe using the HPSF numerical model to understand the source, release, and transport of sediment and contaminants to San Francisco Bay. The Guadalupe River was chosen primarily because of existing data richness and secondarily because of imminent management aimed at reaching loads targets imposed by the Hg TMDLs. Despite data richness, the weakest POC data set is land use specific data during flood flow; more of this kind of data will be collected in Task 4e and are necessary for calibrating the land use specific components of loading models and improving model performance for simulating BMPs.

Objectives: To collect land use specific PCB data at two locations, one mostly non-urban and upstream and one mostly urban and downstream to calibrate the land use components of the HSPF model and provide recommendations for similar efforts elsewhere in the Bay Area.

Task 4b: Pollutants of Concern Monitoring at a Subset of Representative Watersheds – Zone 4 Line A – year 4
Proposed funding 2010 - $150,000

Beginning in 2007, the RMP funded a second small tributaries loading study in a small urban watershed in Hayward. The intent of this study was to understand loads of POCs entering the Bay from a small industrialized tributary near the Bay margin. This watershed was chosen because it contrasts with Guadalupe River in size, land use, rainfall variation, soil types, and location on the Bay margin. The study uses an intensive single station design employing 5 minute interval stage, rainfall, and turbidity

measurement and storm focused isco pump sampling and depth-integrated point sampling. So far this study has been funded for three relatively dry years. Preliminary comparisons to Guadalupe reveal similarity of most POC loads normalized to areas during dry years with the exception of Hg, Cr, and Ni which have greater concentrations and loads in the Guadalupe system most likely due to historic mining.

Objective: Improve regional loads estimates for the class of smaller industrial watersheds near the Bay margin.

Task 4c: Pollutants of Concern Monitoring at a Subset of Representative Watersheds – Reconnaissance

Prop**o**sed funding 2010 - $12,000

Conducting loads studies in "observation" watersheds is a long standing recommendation of the SPLWG (see Davis et al., 2001). Recent TMDL reports on PCBs and Hg emphasize the influence of local small tributaries on water quality in the Bay and call for reduced loadings from urban areas. Provision C.8.f of the February 2009 draft tentative order of the Municipal Regional Permit (MRP) describes the need for Permitees to monitor eight watersheds to generate loads information. The watershed ranking study (Task 3a) planned for completion in early 2010, will provide a list of prioritized watersheds for study. Given logistical constraints such as channel form and safety that restrict the practical implementation of a loads monitoring study, a reconnaissance study will be carried out to investigate the potential for safe and successful sampling in the top ranked watersheds in the context of management questions. Note it is possible that some of these locations could overlap with the list of locations developed in Task 4d.

Objective: Document technically feasible and "safe" locations for consideration for future small tributary loads monitoring.

Task 4d: Pollutants of Concern Monitoring at Representative Land Use sites – Rationale Development and Reconnaissance

Proposed funding 2011 - $30,000

In order to develop models capable of testing and forecasting the effects of best management practices (BMPs) on POC trends (management question 4), data must be collected on land use based concentrations and mass emissions to provide a regional calibration data set. In this task we will refine the rationale for such an effort by reviewing literature and discussing potential modeling questions with local agencies. We will identify land use categories of interest in relation to our POC list. Those presently proposed based on the SoCal experience and discussions at strategy team meetings are a) Agriculture , b) Commercial, c) High density residential, d) Industrial, e) Low density residential, f) Open space, g) Recreational, and h) Transportation. There was also discussion of adding a "land use condition" factor such as age and conditions of roads and drainage systems). A list of potential sampling locations will be developed through a review locations sampled by BASMAA agencies in 1989-1995 and use GIS

and aerial photographs to investigate possible locations in high ranking watersheds (Task 3a) taking into consideration the decisions on land use categories to focus on. Lastly, we will carry out a field reconnaissance to investigate the potential for safe and successful sampling. Note it is possible that some of these locations could overlap with the list of locations developed in Task 4c.

Objective: Provide written documentation of the rationale for land use based sampling and a list of potential sampling locations.

Task 4e: Pollutants of Concern Monitoring at Representative Land Use sites
Proposed funding 2012, 2013, 2014, and 2015 - $100,000/year

In order to develop models capable of testing and forecasting the effects of best management practices (BMPs) on POC trends (management question 4), data must be collected on land use based concentrations and mass emissions to provide a regional calibration data set. We propose to follow the published methods of Tiefenthaler et al. (2008) after an initial assessment of data needs based on what is learned from the Guadalupe River model (see task above), and assessment of the usefulness of existing local data (BASMAA 1996; Soller et al, 2003/SCVURPPP 1998/99; McKee unpublished; EBMUD, 2009). Note the budget for this task depends on POC list, number of sites, and proximity to other loads monitoring sites. The cost proposal will be revised based on the outcomes of Task 3a, 3b, 4c, and 4d. The proposed budget would cover the following tasks:

- Purchasing and installing sampling equipment.
- Sampling storm events at each land use site following the outcomes of Task 3b above (sampling method (discrete or composit; number of samples per storm; number of storms per site).

Objective: Characterize land use specific concentrations and loads as basic data for model development and calibration.

Task 5: Dynamic Modeling in a 2nd Selected Representative Watershed
Proposed funding 2012 - $150,000

The *Strategy* calls for developing regional estimates of loads, tracking progress towards loads reductions, and determining the effectiveness of management towards TMDL goals. The completion of the Guadalupe Model (Task 1) will address all these questions but only for one large mercury contaminated watershed. The objective of this task is to address the answers to these key *Strategy* questions in another watershed (likely focusing on one adjacent to a known “high leverage contaminated Bay Margin”). A key outcome will be an assessment of how management might be able to reduce loads in the context of linkage to the processes of uptake on the Bay margin. This task will necessarily need data provided by Task 4a, 4b, and 4c (POC Monitoring at *a Subset of Representative Watersheds* and Task 4d and 4e (*POC Monitoring in Representative Land Use sites)*. At this time, we propose to use the HSPF modeling platform but there

now exists modified spreadsheet models (annual average time step) that might be considered (e.g., Ha et al in review).

Objective: Expand our modeling capability to test BMPs and predict trends in other representative watersheds.

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Table 1. Study elements, questions and budget allocations small tributaries loadings studies and monitoring proposed for the RMP from 2009 to 2015. Numbers indicate proposed budget allocations in $1,000s. With the exception on those costs that are marked by an asterisk, all other tasks and costs are subject to funding availability and TRC/SC approval.

Task	Description	Question	2009	2010	2011	2012	2013	2014	2015
1	Guadalupe River Model (2008 and 2009)	3,4	75*						
2	Z4LA Small Tributaries Loading Study (Water Years 2007, 2008, 2009)	1,2	100*						
3	Develop Multi-year Watershed Loading Sampling Plan		80*						
3a	Develop Criteria and Rank Watersheds	1,4	25*						
3b	Optimize Sampling Methods for Loading and Trends	1,2,3,4	45*						
3c	Develop/Update Spreadsheet model for Regional Loadings Estimates	2		35	10	10	10	10	10
4	POC Load Monitoring in Representative Watersheds	1,2,3		235	250	250	250	250	250
4a	Guadalupe			43*					
4b	Zone 4 (Year 4)			150*					
4c	Watersheds to Be Named Later (reconnaissance)			12					
4d	Pollutants of Concern Monitoring at Representative Land Use sites – Rationale Development and Reconnaissance	2,3,4		30					
4e	Pollutants of Concern Monitoring at Representative Land Use sites	2,3,4			100?	100?	100?	100?	100?
5	Dynamic Modeling in a 2nd Selected Representative Watershed	2,3,4				150			
	Total		255	270	360	510	360	360	360

* Already incorporated into a preexisting proposed budget.

Appendix 1: Water Board Priorities for Loads Monitoring

This table contains Water Board decisions or management questions and SPLWG activities that might be needed to address these decisions/questions. The priorities are the same as those identified in the Sources Pathways and Loading Workgroup 5-year plan and have been developed through a consensus based discussions by the Work Group during 2007 and 2008.

SPLWG Priority	Pollutant	Near-term Decision or Management Question (5 years)	Modeling or Monitoring Needs for 5 years	Long-term Decision or management question (10 years)	Modeling or Monitoring Needs for 10 years	Comments
Top	Mercury, methylmercury	What is the contribution of local tributaries and storm drains to localized problems at the Bay Margins. What is the rate of progress toward TMDL load allocations. MRP requires monitoring of methyl mercury loads from urban runoff.	Local tribs monitoring studies designed to support Bay Margin modeling. Need local trib monitoring and beginning of model development to be able to estimate full watershed loads to assess TMDL progress.	Is the urban runoff (tribs/storm drains) total mercury load from all being reduced consistent with the TMDL load allocations for urban runoff. What is the spatial pattern of such load reductions to guide where more progress is needed.	Need sufficient and representative local tribs monitoring plus development of predictive model to provide refined assessment of loads from all watersheds/storm drains and determine spatial and perhaps temporal patterns?	The overarching issues are: 1) determining progress toward meeting Bay-wide load allocations; 2) determining if there are local impacts from some tribs that would require special attention; and 3) being able to distinguish local tribs/storm drains that contribute disproportionately either to Bay-wide loads or localized impacts at the margins. The modeling and monitoring should be directed at these issues. See narrative sheet as well.
Top	PCBs	What is the contribution of local tributaries and storm drains to localized problems at the Bay Margins. We also need to understand loads to various segments and gain understanding if those segment-specific loads matter to Bay impairment.	Local tribs monitoring studies designed to support Bay Margin strategy. Need local trib monitoring and beginning of model development to be able to assess full watershed loads and loads by Bay segment.	Are loads of PCBs from all watersheds being reduced consistent with the TMDL load allocations for urban runoff.	Need sufficient and representative local tribs monitoring plus development of predictive model to provide refined assessment of loads from all watersheds/storm drains and determine spatial and perhaps temporal patterns?	See mercury comments.

SPLWG Priority	Pollutant	Near-term Decision or Management Question (5 years)	Modeling or Monitoring Needs for 5 years	Long-term Decision or management question (10 years)	Modeling or Monitoring Needs for 10 years	Comments
High	PBDEs	What is the contribution of local tributaries and storm drains to localized problems at the Bay Margins. What are the loads of PBDEs from all stormdrains and local tribs. We will need baseline loads to track future loading trends. We also would like to gain the understanding of loads by Bay segment as for PCBs.	Local tribs monitoring studies designed to support Bay Margin modeling. Need local trib monitoring and beginning of model development to be able to assess full watershed loads.	Need trends in PBDE loads. If TMDL is developed, we would need refined load estimates for TMDL.	May need similar information as for mercury or PCBs if PBDE TMDL is developed. Otherwise, we would need less detailed information but sufficient monitoring and modeling to PBDE loading trend.	Look for "piggy-back" opportunities in course of doing work on PCBs. We are not sure what the form of the TMDL will look like, but we know that we will need to be confirming loading trajectory at the very least.
SPLWG Priority	Pollutant	Near-term Decision or Management Question (5 years)	Modeling or Monitoring Needs for 5 years	Long-term Decision or management question (10 years)	Modeling or Monitoring Needs for 10 years	Comments
Medium	Pyrethroids	Are these compounds being detected and causing toxicity? How widespread is this toxicity? Are these pesticides found in runoff at levels that would impact Bay margins in terms of toxicity?	Need some level of monitoring and trend assessment - coarse assessment and evaluation of Bay Margin load and toxicity.	Are these compounds being detected and causing toxicity?	Need some level of monitoring and trend assessment - coarse assessment.	Potential emerging replacement class of pesticides. Needs: characterize and track possible impacts per implementation plan of Urban Creeks TMDL for pesticide-related toxicity.
Medium	Dioxins	What is the contribution of local tributaries and storm drains to localized problems at the Bay Margins. We may need rough cut loading estimate to Bay. There may be a need to understand role of atmospheric deposition contributions to trib/storm drain loads. We need improved understanding of presence in runoff and spatial distribution and how relevant are small tribs to Bay impairment.	some similarity to above pollutants plus air deposition monitoring/modeling connection.	The long term needs depend heavily on the nature of the TMDL. If there is a TMDL, we would need at least some assessment of loading trends.	Need some level of monitoring and trend assessment - coarse assessment.	Impairment listing for Bay, assumed benefit from PCB actions. Needs: fill gaps in conceptual model/impairment assessment, including sources, loads; also determine benefits from PCB actions? May eventually need refined load estimates for all types of dioxins (dioxin-like PCBs and the furans). Here too - look for piggy-back opportunities on top of PCB studies. For dioxin: is the loading coming from local or global sources? We will need evidence about this question for TMDL.
Medium	Selenium	We need refined load estimates from local tributaries, probably much more focused on extreme S. Bay at the moment. There could be impairment there and need to understand small trib contribution.	monitoring studies for small tribs in S. Bay to get loading estimates.	Update on local trib load estimates.		North Bay TMDL in development. Needs: refine load estimates from local tributaries. Main focus of monitoring should be S. Bay unless data gaps emerge from N. Bay TMDL development. This is unknown right now.

SPLWG Priority	Pollutant	Near-term Decision or Management Question (5 years)	Modeling or Monitoring Needs for 5 years	Long-term Decision or management question (10 years)	Modeling or Monitoring Needs for 10 years	Comments
Medium	DDT, chlordane, dieldrin	What is the contribution of local tributaries and storm drains to localized problems at the Bay Margins. We also need loading baseline to track trends. Can we do anything to assist recovery that appears to be taking place (any areas needing attention?)? Similar strategy to PBDEs.	Find local sources or major small trib pathways.	Are we still recovering? Trends?		Bay TMDL in development. Needs: refined data to clarify impairment assessment and forecasts. Additionally, characterize loads to Bay in vicinity of areas of elevated legacy pesticides contamination to support Bay Margin modeling strategy. Look for piggy-back opportunities on other work (PCBs). Strategy has many similarities to PBDEs because of phase out of uses and presumed decreasing trends. TMDL may seek to use simple linkage (from PCB?) and largely be based on confirming recovery is underway. Information needs center around needing to confirm that this simple linkage is justified and appropriate and to confirm what additional actions, if any, are needed to assist recovery of the Bay.
SPLWG Priority	Pollutant	Near-term Decision or Management Question (5 years)	Modeling or Monitoring Needs for 5 years	Long-term Decision or management question (10 years)	Modeling or Monitoring Needs for 10 years	Comments
Medium	Copper	Monitor local tribs copper load trends. If copper is going up, we would want to know something about spatial pattern. Lower intensity monitoring here is OK. Additional monitoring triggered by increasing Bay trend though.		What is the trend of copper loads from local tribs?	Need some level of monitoring and trend assessment - coarse assessment.	Site-Specific Objectives (SSOs) for all Bay (copper) Need: periodic load confirmations, especially copper, from local tributaries per SSO implementation plan. If Bay levels increase, need more intensive small tribs monitoring perhaps in portion of Bay seeing increase. We may want to look at historical loading data from 90s to see if trend insights possible.
Medium	PAHs	What is the contribution of local tributaries and storm drains to localized problems at the Bay Margins. See dioxin row - very similar approach.				Impairment listing for some portions of Bay or tributaries. Probably need refined load estimates eventually. There is a possibility that threshold of impairment will be driven downward by NOAA. If so, we will have widespread listings. Strategy is similar to dioxins: distinguish local from global sources and ID local sources. Local sources thought to play a big role for this pollutant, though.
Low	Other trace metals (Ag, As, Cd, Cr, Ni, Pb, Zn)	No specific info needs. Can monitoring these provide insights and understanding of loads of other contaminants.				Some local impairment listings. No urgent data needs at present.

SPLWG Priority	Pollutant	Near-term Decision or Management Question (5 years)	Modeling or Monitoring Needs for 5 years	Long-term Decision or management question (10 years)	Modeling or Monitoring Needs for 10 years	Comments
	OP pesticides	Are these compounds being detected and causing toxicity? Low level effort is probably OK here.		Are these compounds being detected and causing toxicity? Confirm trends, assumed decreasing.		Need: ongoing checks of toxicity presence per implementation plan of Urban Creeks TMDL for pesticide-related toxicity
	Nutrients	What are the loads and speciation of those loads (ammonia etc.)from local tributaries in comparison to other sources like POTWs and big rivers? Are these loads causing localized impairments like algal blooms or toxicity? Also, if Bay becomes clearer, might nutrients lead to some eutrophication problems? Finally, how do nutrients impact localized methylation at Bay Margins? Probably good idea to begin building knowledge base with monitoring and modeling.	Monitoring studies to answer the questions posed.	What is the status of the loads from local tribs? Long-range questions are up in the air right now.		We do not know the impairment status for nutrients so there are no imminent regulatory actions. Some loading data may be needed to support development of conceptual model/impairment assessment. There is a possibly linkage to MeHg loads and/or production in receiving waters. They may play an increasingly important role in Bay trophic status if there are long-term Bay changes in terms of clarity from other causes.

Appendix 2 Tools and Methods Applied to-date for Answering Management Questions

This summary was developed to aid discussions in the early meetings of the Small Tributaries Loading Strategy Team

Tools and methods		Previous uses	Spatial and temporal scale	Planned or in progress in the Bay Area	Technical considerations	Stakeholder / implementation concerns
Field monitoring methods	**Bed sediment surveys** (combining bed sediment concentration with estimates of selected watershed sediment loads)	Used to identify and rank drainage systems with regards to POC concentrations. Combined with estimates of sediment loads to make local and aggregate regional estimates of POC load.	Region wide representing "average conditions"	Yes 1. SFEI prop 13 project, 2. Street sweeping studies, 3. City of Richmond source tracking and solution development	Grain size, there is no reliable relationship between POC in deposited sediment and POCs in water column	Cheap but reliability unknown
	Field based loads studies (combining high resolution flow, surrogate measure (turbidity), manual storm water sampling, lab analysis, regression estimator)	Loads: 1. Sacramento River, 2. Guadalupe River, 3. Zone 4 Line A, 4. pilot in Coyote Creek	Single tributaries. Selected climatic years measured. Other climatic year estimated using long term sediment or climatic data	1. Zone 4 Line A (WY 2009), 2. Sacramento River (WY 2010), 3. Guadalupe River (WY 2010)	Limitations: Only works when there is a relationship between turbidity and POCs; Advantages: High accuracy, multiple uses (loads, water quality exceedences, analysis, modeling, trends, future predictions	Expensive, can't afford to do it everywhere, need to decide where to do it and commit for a number of years. Logistic and cost issues in calibrating Suspended Sediment concentration data, affect site aelection.
	Field based loads studies (combining high resolution flow, automated field sampling (ISCO), lab analysis, averaging estimator)	BASMAA load studies for metals and some organics (1989-1991) that also used SWMM modeling to estimate loads (some monitoring continued during 1990's, see SWMM below)	Single tributaries. Selected climatic years measured. Other climatic year estimated using long term sediment or climatic data	Trial planned for Z4LA in WY 2009	If samples are composites will loose information on concentration variation during floods, loads will be less accurate and it will be unknown if each POC load is bias high or low	Cheaper than surrogate method but reliability unknown. If SSC used instead of TSS, logistic and cost issues apply.

Tools and methods		Previous uses	Spatial and temporal scale	Planned or in progress in the Bay Area	Technical considerations	Stakeholder / implementation concerns
Extrapolation methods	**Area based extrapolation** (load measured in one watershed is scaled up to the Bay Area using an area ratio)	Used in PCB TMDL to estimate regional aggregate stormwater loads based on Guadalupe and Coyote Creek data	Region wide representing "average conditions"		Assumes that Guadalupe is characteristic (has average hydrology and land use of the entire Bay Area)	
	Sediment based extrapolation (load measured in one watershed is scaled up to the Bay Area using a sediment ratio)	Used in the Hg TMDL to estimate regional aggregate stormwater loads based on BASMAA bed sediment data	Region wide representing "average conditions"		Assumes that all sediment is sources from the same places in the landscape regardless of watershed geology, hydrology and land use	Cheap but reliability unknown
Modeling methods	**SIMPLE model** (An empirical model combining rainfall, land use, land use runoff coefficient and POC concentrations)	Used to estimate stormwater loads to coastal waters in 2000	Region wide representing "average conditions"		Assumes empirical relationships between climate land use and POC generation. No consideration for physical processes	Cheap but reliability unknown
	Hydrologic Simulation Program-Fortran (HSPF). A one dimensional watershed scale grid based conceptual model with routing.	Calibration/validation studies in a few selected watersheds by some BASMAA agencies. Being applied by Brake Pad Partnership for modeling Cu aggregate loads to Bay..	Single tributaries. Selected climatic years measured. Other climatic year estimated using long term sediment or climatic data	Guadalupe (sophisticated level for investigating BMPs), Z4LA (simple for estimating long term hydrology)	Requires a lot of input data some of which many not be available at desired resolutions making calibration challenging. Handles non-urban land use well	Expensive, but can be used for testing management scenarios and predicting future loads. What is the treadeoff between cost and achievable sensitivity in forecasting compared to mass balance models?

Tools and methods		Previous uses	Spatial and temporal scale	Planned or in progress in the Bay Area	Technical considerations	Stakeholder / implementation concerns
Modeling methods	**Stormwater Management Model (SWMM).** A watershed scale sub-catchment based conceptual model with routing designed for urban areas.	BASMAA (1989-1991) load studies. ACCWP model for Castro Valley Creek watershed was refined for diazinon and copper 1995-2001	Single tributaries. selected climatic years measured. Other climatic year estimated using long term sediment or climatic data		Requires a lot of input data some of which many not be available at desired resolutions making calibration challenging. Handles urban land use well, less flexible for undeveloped (pervious) or mixed watersheds.	Expensive, but can be used for testing management scenarios and predicting future loads
Statistical methods	**Power Analysis using a Monte Carlo simulation developed in Matlab**. Determine the power to detect user defined trends (e.g. 90% in 20 years) in suspended sediment or contaminant concentration.	Leecaster et al 2002 in Santa Ana R. SoCAL. "Assessment of efficient sampling designs for urban stormwater monitoring"	Single tributaries. Selected climatic years measured.	Yes (perhaps 2008 for suspended sediments in Guadalupe if funding approved)	Many assumptions such as no change in data distributions, no change in source characteristics, no change in dilution effects.	Low cost. Useful to inform the debate on sampling design.
	Lake Core analysis. Uses paleolimnology to identify trends in contaminants in urban and pristine (reference) settings at the multi-decadal scale (50 years)	USGS National Urban Runoff Program studies for understanding national scale trends in environmental quality.	Single tributaries but perhaps regional if atmospheric load is the main source. Decadal (50 years)	Yes 2009 (for multi-contaminants if TRC approves funding)		Decadal time scale - regional in scale if atmospheric load is the main signal. Limited to where there are lakes - not at bottom of watershed