Bay Area Clean Water Agencies
A Joint Powers Public Agency
Leading the Way to Protect our Bay

April 1, 2010

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

Re: BACWA 2009 Mercury Watershed Permit Group Report

Dear Mr. Wolfe:

Enclosed with this letter is the second annual Mercury Watershed Permit Group Report, submitted by the Bay Area Clean Water Agencies (BACWA) on behalf of San Francisco Bay Area publicly owned treatment works (POTWs), as provided for by the Mercury Watershed Permit, Order No. R2-2007-0077, NPDES Permit No. CA0038849. BACWA is a joint powers agency whose members own and operate POTWs and sanitary sewer systems that collectively provide sanitary services to over 6.5 million people in the nine county San Francisco Bay Area. BACWA members are public agencies, governed by elected officials and managed by professionals charged with protecting the environment and public health.

We are very pleased to report that, for the second year, the mass of mercury discharged by Bay Area POTWs is well below the Mercury Watershed Permit's mass limit of 17 kilograms per year. The data collected by BACWA to prepare this report indicate that the mass of mercury emitted by POTWs in 2009 is estimated to be 4.8 kilograms, which is similar to 2008's estimated mass emission of 4.5 kilograms.

This Group Report includes a narrative summary of the data and information submitted by participating agencies, as well as a calculated annual mercury mass emission for all the municipal entities that are listed in Table 6 of the Mercury Watershed Permit. Completed forms for all 37 participating agencies are included in Appendix A. The report is being submitted in both hard copy and electronic formats.

We appreciate the opportunity to submit this report and share this promising information. Please feel free to contact me if you have any questions or would like additional information.

Respectfully submitted,

Amy Chastain
BACWA Executive Director

cc: BACWA Executive Board
Jim Ervin, BACWA Permits Committee Chair
Lila Tang, Regional Water Board
Bill Johnson, Regional Water Board

Bay Area Clean Water Agencies

2009 Mercury Watershed Permit Group Report

April 1, 2010

Prepared by Oakley Water Strategies, Inc.

Bay Area Clean Water Agencies

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Introduction

On November 1, 2007 the San Francisco Bay Regional Water Quality Control Board (Regional Water Board) adopted the mercury watershed permit, also known as National Pollutant Discharge Elimination System (NPDES) Permit No. CA0038849, Regional Water Board Order No. R2-2007-0077. The purpose of the mercury watershed permit was to implement requirements associated with the mercury Total Maximum Daily Load (TMDL), which was adopted by the Regional Water Board in August 2006 and approved by the State Water Resources Control Board (State Water Board) in July 2007. The mercury watershed permit established limitations and requirements on the discharge of mercury from current municipal and industrial NPDES permittees which discharge treated wastewater to San Francisco Bay or its tributaries. This group report is for municipal permittees associated with the watershed permit.

The mercury watershed permit became effective on March 1, 2008 after the approval of the United States Environmental Protection Agency (USEPA), and superceded all existing mercury requirements in existing individual wastewater permits to ensure consistent, complete, and coordinated implementation of the TMDL's requirements.

Watershed Permit Group Reporting Requirements

One of the requirements indicated in the watershed permit was for agencies to report mercury mass loads and source control activities on an annual basis. The permit allowed permittees to report this information either individually, or as part of a group. The Bay Area Clean Water Agencies (BACWA) opted to form a group and invite municipal permittees to participate. If permittees desired to participate in a group process, they needed to notify the Regional Water Board by February 1, 2010 (deadline for annual Self-Monitoring Report, or SMR) of this intent.

Electronic forms for BACWA group participants were prepared to facilitate the reporting process for both participants and the organizer. These electronic forms were developed in MS Excel based on the forms in the watershed permit, and were emailed to potential group participants with a readily available email address on December 1, 2009. The due date for submittal of data under the group reporting program was February 15, 2010. However, since February 15 was a holiday, the forms were allowed to be submitted on Tuesday, February 16, 2010.

Data Collection and Compilation

The annual reporting forms were organized into three parts as follows:

- Part 1 – Basic Information
- Part 2 – Mercury Data
- Part 3A – Source Control Information
- Part 3B – Specific Source Control Checklist

Reporting forms for Part 1 and Part 2 were drawn directly from the mercury watershed permit. The reporting form for Part 3A is identical to mercury watershed permit Part 3. This form was re-numbered in order to incorporate an additional form (Part 3B), which was developed by BACWA and distributed to permittees for the 2009 report in order to obtain more consistent and complete information about source control. The need for this additional form was identified during compilation of the 2008 BACWA Group Report.

Completed forms were received from all 37 of the municipal agencies included in the mercury watershed permit. An additional two entities are listed in the permit as serving domestic customers but are not municipal government agencies. One of these entities, Seafirth Estates Company, is no longer an independent discharger. The Seafirth Estates wastewater treatment plant was decommissioned after two pump stations were installed to transfer sewage to Sanitary District No. 5 of Marin County's Paradise Cove Treatment Facility. The Regional Water Board recorded that the Seafirth Estates plant had ceased operation by October 5, 2009. For the purposes of this 2009 BACWA Group Report, the mass load for Seafirth Estates Company is included independent from the Paradise Cove facility, with a mercury load estimated for nine months of the year. All subsequent mercury loading from this collection system is included in the Paradise Cove facility effluent.

Data were received from group participants by email, fax, and regular mail. Data received by email were in a PDF or MS Excel format. Signed certification pages (in Part 1) were received from all participating agencies. The forms received are shown in **Appendix A**. The distribution of participating municipal permittees in the BACWA group is shown in **Table 1**.

Table 1. BACWA Group Participants

Municipal Permittees Participating in BACWA Group		Municipal Permittees **Not** Participating in BACWA Group
• American Canyon, City of • Benicia, City of • Burlingame, City of • Calistoga, City of • Central Contra Costa Sanitary District • Central Marin Sanitation Agency • Crockett Community Services District – Port Costa • Delta Diablo Sanitation District • East Bay Dischargers Authority • East Bay Municipal Utilities District • Fairfield-Suisun Sewer District • Las Gallinas Valley Sanitary District	• Pinole, City of • Rodeo Sanitary District • Saint Helena, City of • San Francisco, City and County of, SF Int'l Airport (sanitary plant) • San Francisco (Southeast Plant), City and County of • San Jose/Santa Clara, Cities of • San Mateo, City of • Sausalito-Marin City Sanitary District • Sewerage Agency of Southern Marin • Sonoma Valley County Sanitation District • South Bayside System Authority • South San Francisco and San Bruno, Cities of	• East Brother Light Station, Inc. • Seafirth Estates Company

Municipal Permittees Participating in BACWA Group		Municipal Permittees **Not** Participating in BACWA Group
• Marin County (Paradise Cove), Sanitary District No. 5 of • Marin County (Tiburon), Sanitary District No. 5 of • Millbrae, City of • Mt. View Sanitary District • Napa Sanitation District • Novato Sanitary District • Palo Alto, City of • Petaluma, City of	• Sunnyvale, City of • US Naval Support Activity, Treasure Island • Vallejo Sanitation and Flood Control District • West County Agency • Yountville, Town of	

Although most Bay Area municipal permittees normally report data electronically through the Electronic Reporting System (ERS), most agencies provided flow data and mercury concentrations rather than checking the box on the form that data are reported through the ERS without supplying data.

Data submitted by BACWA group participants included all mercury concentration data collected throughout the 2009 calendar year, which were also averaged by month, as well as daily flowrates for sampling days, and a computed annual mass emission. All computations for group participants were checked for accuracy and usage of proper formulas for calculations at a minimum. As indicated in the mercury watershed permit, if data were not available for every month that discharge occurred, an estimated annual mass emission was computed by normalizing the available data over all applicable months.

Estimated Mercury Mass Loads for 2009

The estimated annual mercury mass emission was determined for all municipal permittees listed in the mercury watershed permit. For the two entities that neither participated in the BACWA group nor report to ERS, the individual permittee mass limit from the watershed permit was used as a conservative estimate of actual annual mass emission. These mass limits were used for two very small permittees, namely the Seafirth Estates Company (discussed above), and the East Brother Light Station, Inc. Results for each permittee and the sum for the group are shown in **Table 2**.

Table 2. Estimated Weighted Annual Mass Emission for Municipal Permittees

Municipal Permittee	2009 Annual Mass Emission (kg/yr)	Notes on Computations Conducted for This Report
American Canyon, City of	0.0054	Used agency data and calculations.
Benicia, City of	0.0197	Used agency data and calculations.
Burlingame, City of	0.0229	Used agency data and calculations.
Calistoga, City of	0.0010	Used agency data and calculations.
Central Contra Costa Sanitary District	0.6488	Used agency data and calculations.
Central Marin Sanitation Agency	0.1370	Used agency data and calculations.

Municipal Permittee	2009 Annual Mass Emission (kg/yr)	Notes on Computations Conducted for This Report
Crockett Community Services District (Port Costa)	0.0001	Computed weighted annual mass emission from data provided.
Delta Diablo Sanitation District	0.0641	Used agency data and calculations
East Bay Dischargers Authority	0.8723	Used agency data and calculations.
East Bay Municipal Utility District	0.7398	Used agency data and calculations.
East Brother Light Station, Inc.	0.00001	Used agency mass limit since no data readily available.
Fairfield-Suisun Sewer District	0.0565	Used agency data and calculations.
Las Gallinas Valley Sanitary District	0.0445	Used agency data and calculations.
Marin County (Paradise Cove), Sanitary District No. 5 of	0.0000244	Computed weighted annual mass emission from data provided.
Marin County (Tiburon), Sanitary District No. 5	0.0036	Used agency data and calculations.
Millbrae, City of	0.0265	Used agency data and calculations.
Mt. View Sanitary District	0.0176	Used agency data and calculations.
Napa Sanitation District	0.0236	Used agency data and calculations.
Novato Sanitary District	0.0666	Used agency data and calculations.
Palo Alto, City of	0.0817	Used agency data and calculations.
Petaluma, City of	0.0418	Used agency data and calculations.
Pinole, City of	0.0269	Used ERS data.
Rodeo Sanitary District	0.0100	Used ERS data.
Saint Helena, City of	0	Used agency data and calculations.
San Francisco, City and County of, SF Int'l Airport	0.0023	Used agency data and calculations.
San Francisco (Southeast Plant), City and County of	0.3254	Used agency data and calculations.
San Jose/Santa Clara, Cities of	0.2865	Used agency data and calculations.
San Mateo, City of	0.2960	Used agency data and calculations.
Sausalito-Marin City Sanitary District	0.0379	Used agency data and calculations.
Seafirth Estates Company	0.00027	Used agency mass limit since no data readily available.
Sewerage Agency of Southern Marin	0.0601	Used agency data and calculations.
Sonoma Valley County Sanitation District	0.0049	Used agency data and calculations.
South Bayside System Authority	0.1561	Used agency data and calculations.
South San Francisco and San Bruno, Cities of	0.0680	Used agency data and calculations.
Sunnyvale, City of	0.0637	Used agency data and calculations.
US Naval Support Activity, Treasure Island	0.0046	Used agency data and calculations.
Vallejo Sanitation and Flood Control District	0.2846	Used agency data and calculations.
West County Agency	0.3429	Used agency data and calculations.
Yountville, Town of	0.0022	Computed weighted annual mass emission from data provided.
TOTAL	**4.8**	

Interpretation of Estimated Mass Load Results

The estimated annual mass emission for 2009 is 4.8 kg/yr, which is lower than the mass limit in the watershed permit of 17 kg/yr. The estimated, weighted annual mass emission for 2008 was 4.5 kg/yr. These results are illustrated in **Figure 1**, below.

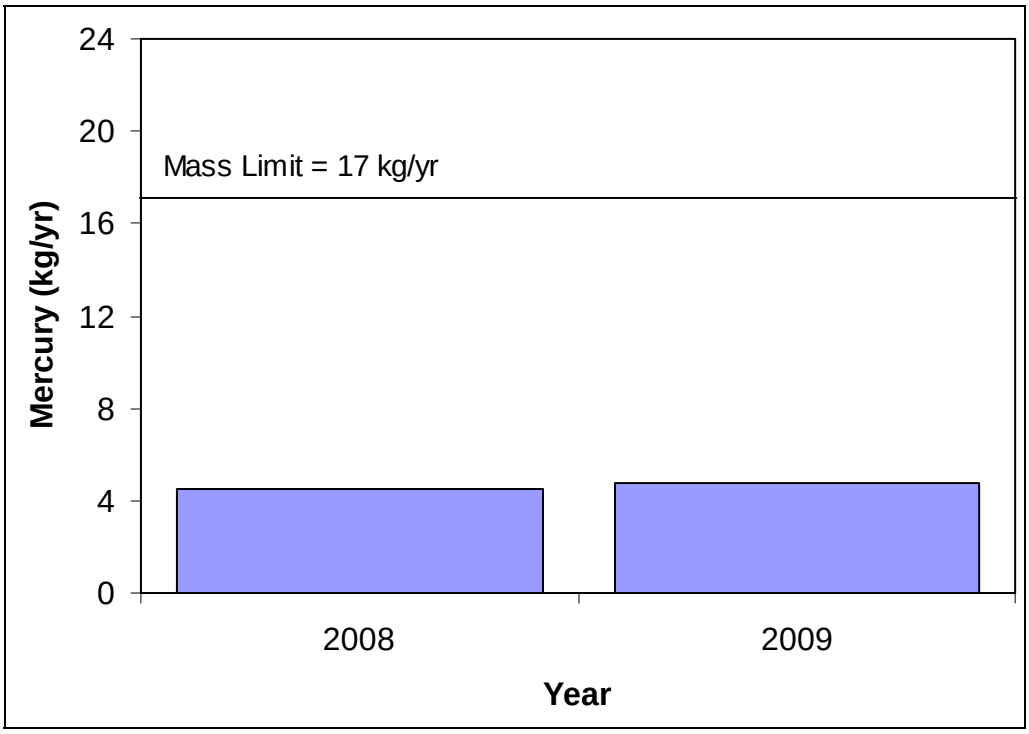

Figure 1. Estimated Annual Mercury Mass Emissions for Municipal Dischargers to San Francisco Bay Compared to the Annual Mass Limit

The total for 2009 is estimated to be slightly higher than the total for 2008, although the difference may be related to the estimation process, and is not necessarily representative of an upward trend in mercury emissions to the Bay. Several additional years of data are needed to accurately identify mass loading trends.

The annual mass emission for 2008 was estimated based on weighted annual average calculations, since reporting only included data collected between March and December of that year, which were then normalized over twelve months. Accordingly, as noted in the 2008 group report, mass loadings for January and February, which are normally the wettest months of the year with higher than average flows in comparison to the other ten months, may not have been accurately represented by the March-December data. If actual January and February data had been used, it is possible that the 2008 group mass emission would have been slightly higher.

Wastewater flows contribute directly to the computation of mass loads, and precipitation is generally correlated with flows, so changes in precipitation are expected to influence the mass emission estimate. California continued to experience drought conditions in 2008 and 2009, which may have contributed to the low group mass emissions for both of these years.

Four agencies did report that elevated wet weather flows in January, February and October of 2009 resulted in higher mercury concentrations and/or loads. One agency suggested that elevated mercury influent concentrations may have been the result of the higher flows washing additional solids out of the sanitary sewers. Two agencies attributed potentially higher mass loadings to a large storm during the October sampling period. One of these agencies noted that the estimation

process most likely resulted in an overestimate of mass loading, as the higher mercury samples recorded during this storm event were then used to characterize longer periods of discharge.

The average of all mercury concentrations reported by BACWA group participants in the 2009 reporting period was approximately 5% less than the average of those reported by participants in the 2008 reporting period. Overall, the estimated annual flow for all municipal agencies in 2009 was approximately 8% greater than the estimated flow for these agencies in 2008.

Approximately 50% of municipal agencies had a lower mercury mass emission and approximately 50% higher, compared to 2008. For total effluent flows, 25% of municipal agencies reported lower estimated total flows in comparison to 72% reporting higher flows (one agency reported the same flows both years). For mercury concentration, 61% reported lower average concentrations, while 39% of participating agencies reported higher average concentrations for 2009.

Based on these comparisons of 2008 and 2009 data, it is expected that mercury loads will continue to be variable among agencies from year to year. A number of additional years of data will be needed in order to identify specific trends. It is also of note that of the estimated 1,220 kg/yr of mercury discharged to San Francisco Bay[1], the municipal agency contribution is 4.8 kg/yr, or 0.4% of the total mass emission to the Bay.

Source Control Activities

Permittees participating in the BACWA group conducted numerous source control activities during the reporting period, as shown in **Table 3** on the following page. Highlights of the source control activities are as follows:

- Dental Amalgam Programs
- Thermometer and/or Thermostat Exchanges
- Fluorescent Light Recycling
- Household Hazardous Waste Collection
- Public Outreach/ Education
- Controls for Vehicle Service Facilities
- Battery Recycling
- Reduction of Mercury in Laboratory Waste
- Hospital/Medical Clinic Mercury Inspections and/or Related Source Reduction Activities

A checklist of possible source control activities was developed and provided to group participants as Part 3B of the reporting forms (as described above) in December 2009. As expected, this checklist resulted in more consistent reporting of source control activities.

Most agencies reported that the amount of mercury reduced from waterways from source control programs was not known, since it is very difficult, for example, to estimate the number of mercury thermometers collected that would not have made it into the sewer. However, agencies that were involved in the collection of household hazardous waste were sometimes able to quantify the mass of mercury collected. The highest of these specific estimates was 145 lbs (66 kg) of mercury, collected at the Household Hazardous Waste Facility at Central Contra Costa Sanitary District during 2009. Several agencies contribute funds for the operation of that facility. In addition, the

[1] Source: *Mercury in San Francisco Bay, Total Maximum Daily Load (TMDL) Proposed Basin Plan Amendment and Staff Report*, California Regional Water Quality Control Board, San Francisco Bay Region, September 2004.

City of Calistoga estimated that 1.5 grams per month per dentist of mercury mass loading could be avoided through dental amalgam program activities.

With respect to dental amalgam programs implemented across the region, BACWA has developed a methodology to evaluate the collective efforts of Bay Area municipal agencies with respect to the two metrics identified in the mercury watershed permit (the percent of dental offices participating in a dental program, and the quantity of dental amalgam collected). The general methodology was shared with Regional Water Board staff in early 2009. Following their feedback, a survey was created for all municipalities to complete, asking detailed questions about their dental program. Of the 39 agencies surveyed, 36 surveys were returned. The information is being used to develop an estimate as of 2009 for both of those metrics. The methodology draft results are currently being reviewed by BACWA representatives and will be provided to the Regional Water Board in 2010.

More source control programs were implemented in 2009 in comparison to 2008. For example, in 2008, 56% of the participating agencies reported they had dental amalgam programs underway and in 2009 this number increased to 84%. Some common elements of the mercury amalgam programs include development of legislation, identifying and contacting dentists in the service area, providing information and resources to dentists regarding amalgam separators and best management practices, and enforcement activities (such as inspections). Stephanie Hughes is assisting BACWA in coordinating dental amalgam programs for the region.

A large amount of public education also occurred during 2009 throughout the Bay Area. In addition to efforts by individual agencies, the Bay Area Pollution Prevention Group (BAPPG), a committee of BACWA, coordinated regional dental outreach pollution prevention activities. In particular, the BAPPG estimates they will have presented mercury pollution prevention information to at least 445 dental hygienist/assistant students by the end of the 2009 – 2010 school year.

In January 2009, the BAPPG held a one-day Dental Office Inspection Training Seminar at the Regional Board Office in Oakland for municipal agency staff. Training was provided on how to effectively conduct a dental office inspection. The training was a follow-up to a previous BAPPG workshop on Creating a Dental Amalgam Program. More than 90 people from Bay Area agencies attended this training. BACWA created a fact sheet that can be used by all interested Bay Area municipalities for dental amalgam outreach, and the fact sheet is attached to this report. BACWA also developed several other materials for agencies new to dental outreach to utilize in their programs, such as dental office self-certification form to indicate the use of Best Management Practices (BMPs). In addition, BAPPG maintains a list of International Organization for Standardization (ISO)-certified dental amalgam separators. BAPPG also maintains a website: http://www.baywise.org/, which includes mercury pollution prevention information and resources for residents and businesses (specifically dentists).

In addition to the reported source control activities, many agencies in the Bay Area recycled their wastewater for irrigation of turf and landscaping, industrial uses, and agriculture. This recycled water does not enter San Francisco Bay, yet most agencies didn't consider this specifically as a source control program in their individual reports.

Table 3. Mercury Source Control Activities By Agency

Municipal Agency Listed in Watershed Permit	Mercury Source Control Projects Underway or Planned, as Reported by Agencies to BACWA **a = project was completed or underway in 2009 (and may be continuing)** **b = project is planned for the near future**						
	Dental Amalgam Program	Fluorescent Light Recycling	Household Hazardous Waste Collection	Public Outreach/ Education	Thermometer and/or Thermostat Exchange	Vehicle Service Facilities	Other
American Canyon, City of	a,b	a	a	a,b	a	b	
Benicia, City of	b	a	a	a		(1)	
Burlingame, City of	a,b	a	a	a	a	a	(2) a
Calistoga, City of	a						
Central Contra Costa Sanitary District	a	a	a	a	a	a	(3,4,5) a,b
Central Marin Sanitation Agency	a,b	a	a (6)	a	a	a	
Crockett Community Services District (Port Costa)		a	a	a	a	a	
Delta Diablo Sanitation District	a,b	a	a	a	a	a	
East Bay Dischargers Authority	a,b	a,b	a,b	a	a,b	b	(4,5) a,b
East Bay Municipal Utility District	a,b			a	a	a	(4) a
East Brother Light Station, Inc. (7)							
Fairfield-Suisun Sewer District	a		a	a			
Las Gallinas Valley Sanitary District	a,b	a	a	a	a	a	(8) a
Marin County (Paradise Cove), Sanitary District No. 5 of	a,b			a,b	a		
Marin County (Tiburon), Sanitary District No. 5	a,b			a,b	a		
Millbrae, City of	a,b	a		a	a		(8) a
Mt. View Sanitary District	a,b	a	a	a	a	a	
Napa Sanitation District	a			a	a		(9) a,b
Novato Sanitary District	a,b	a	a	a	a	a,b	(8) a
Palo Alto, City of	a,b	a,b	a,b	a,b	a,b	a,b	(10) a,b
Petaluma, City of	a,b	a	a			a	
Pinole, City of	a,b	b	a	a	a	a	(5) b
Rodeo Sanitary District	a,b	a		a	a		(8) a
Saint Helena, City of							
San Francisco, City and County of, SF Int'l Airport		a	a		a		(11) b
San Francisco (Southeast Plant), City and County of	a	a	a	a	a,b		(3,4) b
San Jose/Santa Clara, Cities of	a	a	a	a	a		
San Mateo, City of	a,b	a	a	a	a		

Municipal Agency Listed in Watershed Permit	Mercury Source Control Projects Underway or Planned, as Reported by Agencies to BACWA **a = project was completed or underway in 2009 (and may be continuing)** **b = project is planned for the near future**						
	Dental Amalgam Program	Fluorescent Light Recycling	Household Hazardous Waste Collection	Public Outreach/ Education	Thermometer and/or Thermostat Exchange	Vehicle Service Facilities	Other
Sausalito-Marin City Sanitary District	a,b	a,b	b	a,b			(8) a,b
Seafirth Estates Company (7)							
Sewerage Agency of Southern Marin	a,b	a,b		a,b	a,b		(8) a,b
Sonoma Valley County Sanitation District	a,b		a	a		a	
South Bayside System Authority	a,b			a	a		
South San Francisco and San Bruno, Cities of	a,b	a,b		a,b	a,b	a	
Sunnyvale, City of	a,b	a,b	a,b	a,b	a,b	a,b	
US Naval Support Activity, Treasure Island		a	a	a	a		
Vallejo Sanitation and Flood Control District	a,b	a,b		a,b	a,b	a	
West County Agency	a	a	a	a	a	a	
Yountville, Town of		a	a	a			(4) a,b

(1) Vehicle maintenance facilities were offered a choice of cementing floor drains or receiving an industrial discharge permit. All chose cementing floor drains. New facilities will be captured.

(2) A sewer science course was given in the science class of Burlingame High School with over 400 students in attendance.

(3) Public school pollution prevention audits, outreach, or other source reduction programs were completed, underway, and/or planned for the near future.

(4) Hospital/medical clinic mercury inspections and/or related source reduction activities were completed, underway, and/or planned for the near future.

(5) Reduction of mercury laboratory waste was completed, underway, and/or planned for the near future.

(6) Household hazardous waste collection is handled by the County of Marin in cooperation with Marin Sanitary Service. The permittee provides public education and outreach advertising for the collection facilities.

(7) This permittee serves domestic customers but is not a municipal government agency.

(8) A battery recycling program was completed, underway, and/or planned for the near future.

(9) A dental mercury source control study and schedule were under development and were expected to be implemented in 2010.

(10) A mercury switch replacement program was underway in 2009 with plans to continue it.

(11) A water reclamation project is in the planning stages.

Summary and Conclusions

The weighted annual average mercury mass load for all municipal permittees to San Francisco Bay for 2009 is calculated to be 4.8 kg/yr. This mass load is comparable to that estimated for the 2008 calendar year (4.5 kg/yr), considering the uncertainties in the estimation process. Annual mass emission estimates for both 2008 and 2009 are lower than the 17 kg/yr limit.

Agencies participating in the BACWA group conducted many mercury source control programs, and in some cases quantified the amount of mercury collected. For example, the Central Contra Costa Sanitary District reported that 145 pounds of mercury were collected at the Household Hazardous Waste Facility at Central Contra Costa Sanitary District during 2009. However, many agencies reported that they could not yet determine the amount of mercury reduced from waterways as a result of source control programs.

In 2009, BACWA worked with its member agencies to continue development of the dental amalgam programs around the San Francisco Bay Area. The percentage of agencies participating in this Group Report that were implementing dental amalgam programs increased from 56% in 2008 to 84% in 2009.

BAPPG, a BACWA committee, also continues to work on region-wide mercury pollution prevention projects. It is estimated that BAPPG will have educated at least 445 dental hygienist/assistant students in the 2009-2010 school year regarding effective mercury management practices. The group also maintains a comprehensive pollution prevention website that includes extensive resources for residents and businesses regarding mercury. Individual dischargers as well as BAPPG plan to continue to increase mercury pollution prevention activities throughout 2010.