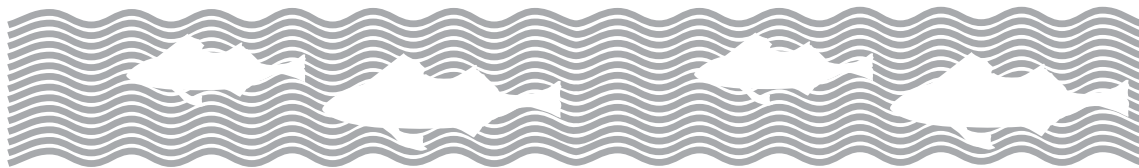


# **Feasibility Study and Request for Compliance Schedules and Interim Limits**

*Naval Support Activity, Treasure Island  
(NPDES Permit No. CA0110116)*

**March 4, 2004**



***D R A F T***

**Feasibility Study and Request for Compliance  
Schedules and Interim Limits**

***Naval Support Activity, Treasure Island  
(NPDES Permit No. CA0110116)***

***Submitted by***

**U.S. Navy  
Naval Facilities Engineering Command  
Southwest Division**

***and***

**City and County of San Francisco  
Public Utilities Commission  
Planning Bureau**

***Submitted to***

**San Francisco Regional Water Quality Control Board  
Oakland, California**

**March 4, 2004**

## Introduction

The U.S. Navy has applied to the California Regional Water Quality Control Board for reissuance of its National Pollutant Discharge Elimination System (NPDES) permit for discharge of pollutants from the Naval Support Activity, Treasure Island, to waters of San Francisco Bay. This permit was previously issued as Order 95-126 (NPDES Permit No. CA0110116). The Regional Board has prepared a draft of the permit including proposed effluent limitations.

The U.S. Navy plans to transfer ownership of the facility to the City of San Francisco's Treasure Island Development Authority over the next several years. The City and County of San Francisco (hereinafter San Francisco) currently operates the wastewater treatment facility and will additionally implement the pollution prevention measures identified in this document.

The U.S. Navy and San Francisco are submitting the enclosed feasibility study and related request for compliance schedule and interim limits to the Regional Water Quality Control Board (RWQCB). This document is intended to demonstrate the wastewater treatment's facility inability to consistently comply with proposed final water quality-based effluent limits for the following main constituents of concern (COCs):

- Copper
- Mercury

These two constituents were identified in the Regional Board's preliminary draft as not complying with the proposed final effluent limitations.

In addition, this feasibility study also addresses several pollutants for which compliance is undetermined due to lack of data:

- Cyanide
- 4,4'-DDE
- Dieldrin

For these constituents lack of effluent monitoring data at low enough detection levels means that final effluent limits cannot be calculated.

## Background

This study of the feasibility of achieving compliance with proposed final effluent limits for copper and mercury is being provided in response to the water quality-based effluent limits that are proposed in the draft Tentative Order for the renewal of NPDES Permit No. CA0110116 for the wastewater discharge to San Francisco Bay from the Treasure Island wastewater treatment facility. The requirement for feasibility studies as a way to document the need for interim effluent limits was first suggested on May 3, 2001, and further defined in a May 11, 2001, meeting between representatives of Bay area dischargers, the RWQCB, the U. S. Environmental Protection Agency (USEPA), and the State Water Resources Control Board (SWRCB). Subsequently, various Bay Area dischargers have submitted feasibility studies to the RWQCB and have had their permits

adopted with effluent limits based on those studies. It is the understanding of the Navy and San Francisco that those studies were sufficient to prove inability to comply with the proposed final water quality-based effluent limits. Hence, this analysis and documentation is generally based on those previous examples. In addition, this document also briefly addresses the constituents for which adequate monitoring data is not available.

It is the applicants understanding that it is necessary to demonstrate that it is infeasible to meet the final effluent limits for the two COCs listed above in order to be granted compliance schedules and interim effluent limits in the renewed NPDES permit. If the discharger believes it is infeasible to meet a California Toxic Rule (CTR)/State Implementation Policy (SIP) water quality-based effluent limit, then the SIP procedures should be followed. Similarly, water quality-based effluent limits based on the Basin Plan should follow procedures outlined in the 1995 Basin Plan. The RWQCB will determine if a compliance schedule and interim limits are appropriate, based on the discharger's submittal. If the RWQCB agrees that immediate compliance is infeasible, and that all the conditions are met, a compliance schedule and interim limit can be established on a constituent-by-constituent basis. Accordingly, if the RWQCB believes that a compliance schedule and interim limits are not justified by this submittal for one or more of the COCs, the Navy and San Francisco requests that the RWQCB hold the adoption of the Tentative Order (TO) in abeyance until additional data can be provided to allow full consideration of the discharges inability to immediately comply with the subject final water quality-based effluent limits.

There are two bases for the feasibility analysis:

- 1) *The Policy for Implementation of Toxics Standards for Inland Surface Waters, Enclosed Bays and Estuaries of California* (known as the SIP - March 2000) which establishes statewide policy for NPDES permitting, and
- 2) *The RWQCB's Basin Plan, 1995.*

The SIP provides for the situation where an existing NPDES discharger cannot immediately comply with an effluent limitation derived from a California Toxics Rule (CTR) criterion. The SIP allows for the adoption of interim effluent limits and a schedule to achieve compliance with a water quality-based effluent limit in such cases. To qualify for interim limits and a compliance schedule, the discharger must request and/or demonstrate that it is appropriate to establish interim requirements for implementation of CTR criteria.

The SIP defines the term "infeasible" as "not capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors."

The SIP requires submittal of the following information to the RWQCB to support a finding of infeasibility:

- Documentation that diligent efforts have been made to quantify pollutant levels in the discharge and sources of the pollutant in the waste stream, including the results of those

efforts;

- Documentation of source control and/or pollution minimization efforts currently underway or completed;
- A proposed schedule for additional or future source control measures, pollutant minimization, or waste treatment; and
- A demonstration that the proposed schedule is as short as practicable.

The SIP requires that interim numeric effluent limits be based on (a) current treatment facility performance or (b) limits in the existing permit, whichever is more stringent.

The SIP also requires that compliance schedules be limited to specific time periods. For constituents not on the 303(d) list, the maximum length of the compliance schedule is five years from the date of permit issuance. For constituents on the 303(d) list (where a TMDL is required to be prepared), the maximum length of the compliance schedule is 20 years from the effective date of the SIP (March 2000). To secure the TMDL-based compliance schedule, the discharger must make commitments to support and expedite development of the associated TMDL.

In similar fashion, when a NPDES discharger cannot immediately comply with an effluent limitation from a Basin Plan criterion, the Basin Plan allows the RWQCB to consider the discharger's proposals for longer compliance schedules where the revised effluent limitation will not be immediately met. The Basin Plan justification for compliance schedules is essentially the same as the SIP procedure. Both procedures require implementation of pollution prevention measures to reduce COC loadings to the maximum extent practicable as soon as possible.

## Constituents to be Evaluated

The constituents for which the Navy and San Francisco request interim effluent limits in the renewal of NPDES No. CA0110116 are shown in Table 1.

**Table 1 - Primary Constituents of Concern**

CONSTITUENT	ON 303(D) LIST?	BASIS OF LIMIT	
		CTR	BASIN PLAN
<i>Mercury</i>	Yes		√
<i>Copper</i>	Yes (?)	√	

**Other Potential Constituents of Concern:** Several constituents (cyanide, 4,4'-DDE, Dieldrin) have a questionable reasonable potential status which may be resolved by a Bay area discharger-sponsored data collection or by additional sampling at the facility (cyanide).

### Proposed Water Quality-Based Effluent Limits and Current Treatment Facility Performance for Constituents of Concern

The RWQCB staff transmitted proposed final water quality-based effluent limits for the Treasure Island Naval Support Activity, for the constituents of concern in a February 12, 2004 preliminary draft Tentative Order. These limits may be modified before final adoption. The proposed final effluent limits and the treatment facility's effluent quality are summarized in Table 2 for the constituents of concern. Effluent quality for the two metals is based on data collected between October 2000 and October 2003.

**Table 2 - Proposed Final Limits Compared with Effluent Quality  
(Primary Constituents of Concern)**

CONSTITUENT OF CONCERN	FINAL WATER QUALITY-BASED EFFLUENT LIMITS (1)		NAVAL SUPPORT FACILITY EFFLUENT QUALITY (4)	
	AMEL (2)	MDEL (3)	MEAN	MEC (5)
Copper, ug/L	12.9 (aq lf)	24 (aq lf)	14	46.4
Mercury, ug/L	0.021 (aq lf)	0.041 (aq lf)	0.024	0.071

*Notes:* "aq lf" – AMEL/MDEL is based on aquatic life criterion; "hh" – AMEL/MDEL is based on human health criterion. In each case the lowest criterion is indicated.

- 1 Final limits as stated in February 12, 2004 preliminary draft Tentative Order package for Treasure Island Naval Support Activity
- 2 Average monthly effluent limit
- 3 Maximum daily effluent limit
- 4 Data set timeframe for mercury and copper is 10/12/00 through 10/17/03
- 5 MEC = Maximum Effluent Concentration observed in the data set [see Section 1.3 of the SIP]

It is the discharger's understanding that the water quality-based effluent limits shown in Table 2 are calculated using procedures described in Section 1.4 of the SIP. Background values (maximum or average, as appropriate for the COC in question) were derived from Regional Monitoring Program (RMP) data collected at two Central Bay stations (Yerba Buena Island and Richardson Bay). Dilution values used in the calculation of water-quality-based effluent limits were as follows:

- Dilution = 10:1 for non-bioaccumulative pollutants (copper). (Note that San Francisco has proposed in its comments on the preliminary draft that the effluent limit calculation use real dilution as determined by dye studies and numerical discharge models.)

- Dilution = zero for 303(d)-listed and bioaccumulative pollutants (mercury). (Note that San Francisco has questioned the appropriateness of this approach for de minimis discharges such as the POTW effluents.)

### Other Potential Constituents of Concern

**Table 3 - Proposed Final Limits Compared with Effluent Quality  
(Other Constituents of Concern)**

<b>CONSTITUENT OF CONCERN</b>	<b>FINAL WATER QUALITY-BASED EFFLUENT LIMITS (1)</b>		<b>NAVAL SUPPORT FACILITY EFFLUENT QUALITY</b>	
	<b>AMEL (2)</b>	<b>MDEL (3)</b>	<b>MEAN</b>	<b>MEC (4)</b>
Cyanide, ug/L	3.2	6.4	NA	2.6 ug/l (5)
4,4'-DDE, ug/L	0.00059	0.00118	Not detected (6)	Not detected (6)
Dieldrin, ug/L	0.00014	0.00028	Not detected	Not detected

NA - not available (inadequate number of samples);

- 1 Final limits as stated in February 12, 2004 preliminary draft Tentative Order package for Treasure Island Naval Support Activity
- 2 Average monthly effluent limit
- 3 Maximum daily effluent limit
- 4 MEC = Maximum Effluent Concentration observed in the data set [see Section 1.3 of the SIP]
- 5 Cyanide – this MEC value was the only value detected above the detection limit.
- 6 The detection limit for 4,4'-DDE - 0.15 ug/L , for Dieldrin – 0.0024 ug/L

As shown, the compliance status for the constituents in Table 3 is unclear at this time. The two “legacy pollutants”, 4,4'-DDE and Dieldrin, have detection limits which are not low enough to determine compliance. These two pollutants are considered to have a reasonable potential to exceed standards because background concentrations have been measured in the Bay at levels above the criteria. Cyanide is generally “non-detect” but one quantifiable sample was found at 2.6 ug/l which is below both the AMEL and MDEL but above the Bay objective.

## Compliance with Final Water Quality-Based Effluent Limits for Constituents of Concern

As shown in Table 2, based upon current performance, the treatment facility will not be able to immediately comply with proposed final effluent limits for the two primary COCs. Consequently, interim effluent limits and a compliance schedule to attempt to meet final limits should be granted in the reissued NPDES permit.

The discharge from the Treasure Island Naval Support Activity indicate that immediate compliance with the final effluent limits for copper is very unlikely. The MEC concentration would result in permit violations at the proposed AMEL and MDEL. The long-term average also exceeds the AMEL. Therefore, interim effluent limits for copper and a compliance schedule to attempt to meet final copper limits should be granted in the new NPDES permit.

The effluent characteristics for mercury also indicate that immediate compliance with the final effluent limits is similarly unlikely. The MEC concentration would result in permit violations at the proposed AMEL and MDEL. The effluent long-term average (0.024) is also slightly higher than the AMEL (0.021). Although some months may be in compliance, the discharge would likely have exceedances in most months. Therefore, interim effluent limits for mercury and a compliance schedule to attempt to meet final mercury limits should also be granted in the new NPDES permit.

Table 4 lists the interim limits which could be considered for this permit.

**Table 4 - Possible Interim Limits for Primary Pollutants of Concern**

CONSTITUENT OF CONCERN	INTERIM EFFLUENT LIMITS	BASIS	ISSUES	ALTERNATIVE INTERIM LIMIT BASED ON MEC
Copper, ug/L	37 (daily avg.)	Previous permit (this is more stringent than the calculated performance based limit – 39.3 ug/L)	This concentration was exceeded on Nov. 18, 2002 (46.4 ug/L). The inability to consistently comply with the existing effluent limit may be the basis for an alternative compliance standard	46.4 ug/L
Mercury, ug/L	0.087 (monthly avg.)	Pooled data for secondary treatment plants in the Bay Area	Samples included a 0.07 ug/L and also several at 0.04 and 0.05 during the last three years. This proposed limit may also be exceeded.	TBD

Because the possible interim limits identified in the second column of Table 3 have a high likelihood of being exceeded during the next permit cycle, the permit applicant requests that compliance determinations be made on an alternative basis. For example, compliance could be based on the average mass loading or other basis. Another option is using the MEC value for copper. A copper limitation higher than the previous permit can be justified on basis that a



properly operated and maintained facility has been nevertheless unable to comply with the limitation. The interim limit for mercury of 0.087 ug/L is based on pooled data for major secondary treatment plants. This Treasure Island facility has an average dry weather flow of 0.2 to 0.4 mgd and thus would be classed a minor facility based on current flow. Neither this facility nor other minor facilities were included in the data pool used to calculate the Bay-wide interim limit. It is possible that smaller facilities are likely to have more erratic results than larger facilities because of the averaging effect of large wastewater systems.

Table 5 lists the interim limits which could be considered for this permit for the other pollutants which need to be addressed.

**Table 5 - Possible Interim Limits for Other Pollutants of Concern**

CONSTITUENT OF CONCERN	INTERIM EFFLUENT LIMITS	BASIS	ISSUES
Cyanide, ug/L	10 (daily avg.)	Previous permit	Currently there is inadequate data to determine the compliance status although there is not evidence of exceedance of the calculated final limits.
4,4'-DDE, ug/L	0.05	Common detection limit (?)	No evidence that this constituent is present in the discharge
Dieldrin, ug/L	0.01	Common detection limit (?)	No evidence that this constituent is present in the discharge

## **Current and Future Pollutant Reductions Efforts for the Constituents of Concern**

The remainder of this study discusses the current source identification efforts, current pollution prevention efforts, and proposed future pollution prevention efforts directed at the primary COCs. The focus is on San Francisco activities rather than the Navy's since San Francisco currently operates the treatment facilities and ownership is expected to be transferred to San Francisco during the permit period. San Francisco intends to extend its pollution prevention program to Treasure Island when ownership is transferred.

At the end of this document there is a section which summarizes the efforts directed toward the other potential COCs: Cyanide, 4,4'-DDE, and Dieldrin.

## **General Source Identification Efforts for the primary COCs**

### Heavy Metals

Copper and mercury are both considered heavy metals. San Francisco's source identification efforts directed at heavy metals include the following studies and reports. This information is used to inform and direct the City's ongoing pollution prevention efforts. While some of the information collection efforts was directed at inflow to current ("mainland") San Francisco treatment facilities, the results are a useful guide for pollution prevention programs regardless of location.

It should also be noted that while Treasure Island has a separate sanitary sewer system, virtually all of San Francisco proper relies on a combined sewer system. Consequently, the City's pollution prevention program has been directed at limiting toxics carried by both domestic wastewater and by stormwater runoff. The pollution prevention program required as a basis for establishing interim limits for Treasure Island need only be directed at pollutants entering the separate sanitary sewer systems. However, pollution prevention efforts directed at stormwater runoff obviously have environmental benefits and thus are included in the following discussion. San Francisco will implement its dual program – directed at both sanitary sewer pollutants and stormwater pollutants – on Treasure Island.

- *Consumer Products Heavy Metals Inventory* (August 1991) – This report identified metal content in common consumer products in order to better target reduction and consumer education efforts.
- *Mass Loadings of Used Motor Oil and Latex Paints to the Sewerage System* (November 1993) - This study estimated the mass loading of copper, mercury, and other heavy metals to the sewerage system due to the discharge of used oil and latex paints to the sewer system as well as vehicular leakage and washing of paint equipment. This report

estimated that the discharge of older latex paints to inside/street drains contributed between 1.5 and 5.3% of the total mercury in the influent to the Southeast Treatment Plant. This information led to the City's Latex Paint Recycling Initiative (described later).

- *Cooling Tower Study* (December 1995) – This study looked at sources such as office buildings, hotels, medical facilities, museums/municipal buildings, etc. to determine if cooling towers were present and what chemicals were being used in the towers. Tower blowdown was sampled for mercury, copper, tributyltin and other constituents.
- *1995/96 Scoping Study Report* (June 1996) – This report calculated metal and other pollutant loadings to the Southeast Treatment Plant from Screen Printers.
- *Identifying Potential Storm Water Pollution Sources Using a Geographic Information System and Estimating Sediment Catch Basin Efficiencies* (May 1998) – San Francisco has a combined sewer system and therefore the source identification efforts are directed at both dry and wet weather sources. This project produced a Geographic Information System (GIS) database mapping potential business storm water sources covering the entire City. The database includes information on targeted businesses (address, telephone number, SIC code). In addition, this project analyzed five years worth of influent and effluent data for four catch basins to determine the removal efficiency for five toxic heavy metals (including copper; mercury results were consistently below detection limits).

#### Copper - Additional Source Identification

The City's pretreatment program monitors copper (as well as other constituents) at Significant Industrial Users (SIUs) such as food processors and medical facilities as well as non-significant industrial users (IUs) such as taxicab operators and bus washes.

#### Mercury - Additional Source Identification

The pretreatment program monitors mercury from potential sources. In particular, the City has initiated special monitoring at certain medical facilities to identify the significance of medical sources, including dental offices.

#### Summary of COC Source Identification Efforts

San Francisco's source identification efforts have been very comprehensive and in several areas (e.g., consumer products) are possibly the most thorough in the nation. These efforts have allowed the City to effectively target the major sources of these key pollutants.

## San Francisco's Prior and Existing Pollution Prevention Efforts for the COCs

### *General Program Activities*

***Note: the focussed Copper and Mercury program activities are addressed in separate sections below***

### Water Pollution Prevention Program (WPPP) and Related General Activities

In order to reduce the levels of toxic constituents entering the wastewater system from industrial, commercial, and residential sources, the City has undertaken a proactive pollution prevention effort. The City defines pollution prevention as any "measures" whether technical, institutional, or educational, that contribute to reducing mass loadings of pollutants into the sewer system. This effort targets both wet weather runoff and domestic and industrial sewage. Several of the subsections below describe specific activities directed toward reductions in the COCs.

- *Pretreatment Program – Local Limits* – Since requirements were established by the Clean Water Act in the 1970s, San Francisco has implemented an approved pretreatment program designed to control wastes released to the sewer system by industries, other commercial facilities, hospitals, and other major non-residential sources. The local limits, including standards for mercury and copper, are periodically reviewed. The current standards were established in 1990 and reviewed again in 1998. City staff routinely inspect facilities and take sewer line samples to ensure that local sources are complying with the City's standards. Approximately 30,000 samples are collected each year and entered into a Laboratory Information Management System (LIMS) for tracking and enforcement purposes.
- *Waste Minimization Program* – San Francisco requires all Significant Industrial Users (SIUs) to prepare waste minimization plans and complete storm water pollution prevention checklists and spill prevention plans. Certain Permitted Industrial Users (IUs) are also required to prepare these documents.
- *Latex Paint Recycling Initiative (Operated by Hazardous Waste Management Program)* – This effort established seven locations around the City for the collection of unwanted latex paint. In 1990, U.S. EPA regulations reduced the mercury content in latex paints. However, some use was still allowed (up to 200 ppm in exterior paints) and a considerable amount of old (pre-reduction) paints were in the marketing chain or in the possession of painters and residents. Sampling of latex paints in 1993 at the City's household recycling center found average concentrations of mercury of 125 ppm. Thus, the latex control efforts were important for reducing mercury loadings to the treatment plant.

The latex paint collection and recycling program continues and is a popular program.

San Francisco residents can drop off unwanted latex paint at the household hazardous waste facility, or call for an appointment for pickup at their home.

- *Targeted Facility Control Efforts* – San Francisco developed and implemented comprehensive programs for both runoff and sewer discharges for several industrial categories considered as significant sources:
  - *Automotive Repair Facility Pollution Prevention Program* - The City developed and implemented a bilingual multi-year inspection and audit program which was primarily educational in nature (see the *Green Wrench Guide* discussed below). A total of 372 shops were visited (and sometimes revisited) during this three phase program. In particular, this effort targeted radiator repair and coolant change as potential sources of copper.
  - *Facility Audit Program* – This contractor effort targeted 145 businesses in the Lower Army and Lower Shelby drainage area.
  - *Machine Shop Facilities Pollution Prevention Program* – Sixteen businesses were visited as part of this effort to identify and help control pollutants of concern.
  - *Automotive Dismantler Facilities Pollution Prevention Program* – Using a checklist with 22 BMPs, a City contractor visited nine facilities as part of this audit effort.
- *Public Outreach and Education* – San Francisco has limited heavy industry, so much of the pollution prevention effort is directed at residents and local businesses. These efforts are extensive and the following list is not inclusive:
  - *“Environmental House”* – San Francisco developed a whimsical, portable “house” to take to street fairs to educate the public, and especially kids, about pollution prevention practices. The House is now a permanent exhibit at the San Francisco Unified School District’s Environmental Science Center at Fort Funston.
  - *Hazardous Materials Resource Center* - The Resource Center contains user-friendly journals and computers to answer citizens questions. The center is located at 1145 Market Street, Suite 404, and is open to the public Monday - Friday, 10:00 a.m. - 2:00 p.m. or by appointment.
  - *Rx for a Healthy Environment, Pollution Prevention Tips for Hospitals & Medical Office Buildings* – This guide addresses mercury thermometers and other mercury sources.
  - *Never Down the Drain, Pollution Prevention Tips for Dental Offices* – This document also targets mercury and contains the *Resource Guide – Useful Information for Properly Managing Your Dental Waste*. San Francisco estimates

that 12% of the mercury in the Southeast treatment plant influent is from dental offices (Seattle estimated 14%). Dental offices are a primary target of the pollution prevention program.

- *Managing the Less Toxic Building, Pollution Prevention Tips for Commercial Office Buildings* – This guide addresses copper-based root control products, copper concentrations in cooling towers, as well as control of corrosion from copper piping.
- *Only Rain Down the Drain, Storm Water Pollution Prevention Tips for Commercial and Industrial Businesses.*
- *Clean Image: Pollution Prevention Tips for Photoprocessing and Printing Operations.*
- *The Green Wrench Guide, Pollution Prevention Tips for Auto Repair and Body Shops* (also in Spanish) – This guide particularly targets control of auto fluids such as waste antifreeze which can be a major source of copper.
- Consumer Guides (available in English, Spanish, Chinese):
  - ❑ *Remodel It! Home Improvement Tips for the Do-It-Yourselfer.*
  - ❑ *Control It! Less Toxic Methods to Control and Prevent Pests In and Around Your Home.*
  - ❑ *Fix It! Quick Guide to Car Care for the Do-It-Yourselfer.*
  - ❑ *Grow It! The Less Toxic Garden.*
  - ❑ *Clean It! – Safer Housecleaning Methods that Really Work.*
- *Storm Drain Labeling* – The City labels storm drains with “Don’t dump - drains to Bay” (or Ocean).
- *Gardening Calendars* – These calendars contain tips on alternatives to pesticide use for home gardeners.
- *Gardening Tips, Household Tips, and Car Repair* – On the internet at: [http://sfwater.org/detail.cfm/MSC\\_ID/46/MTO\\_ID/18/MC\\_ID/10/C\\_ID/333/holdSession/1](http://sfwater.org/detail.cfm/MSC_ID/46/MTO_ID/18/MC_ID/10/C_ID/333/holdSession/1)
- *Drive-Through Hazardous Waste Disposal for San Francisco Residents* - How to use the Household Hazardous Waste Facility.
- *For Residents* - Fact sheet on how to safely dispose of chemical products from the home.
- *Protect Your Family from Lead in Your Home* - Booklet with information on sources of lead exposure, how to detect them, and reduce exposure.

- *Lead In Your Home* - Lead laws and how to protect children.
- *Mercury Thermometers and Your Family's Health*
- *On The Safe Side* - The City publishes this newsletter twice a year. It is directed at small businesses in San Francisco to inform them of hazardous waste disposal options, the newest waste minimization & pollution prevention technologies, information on what other small businesses are doing, and descriptions of Hazardous Waste Management Program services.
- *Program Evaluation* - In addition, to its inspection and enforcement efforts the WPPP promotes a substantial public education effort as described above. An essential component of such efforts is regular review to ensure that the education message is effective in changing public attitudes and behavior. The City's independent program evaluation efforts include the following surveys. The 1998 survey is described in more depth.
  - *Best Management Practices - Public Awareness Survey (August 1992)* - Prepared by PAM and Public Research Institute, San Francisco State University.
  - *Educating the Public About the Use and Safe Disposal of Household Toxic Products: A Survey of San Francisco Households (July 1994)* - Prepared by PAM and Public Research Institute, San Francisco State University.
  - *Educating the Public About the Use and Safe Disposal of Household Toxic Products: A Survey of San Francisco Households (June 1996)* - Prepared by PAM and Public Research Institute, San Francisco State University.
  - *"Clean It" Survey Results (June 1997)* - This survey evaluated the impact of the guide: *Clean It! - Safer Housecleaning Methods that Really Work*.
  - *Survey of San Francisco Households (July 1998)* - Prepared by Public Research Institute, San Francisco State University. This was a telephone survey of 350 households conducted in order to inform the development of educational campaigns aimed at the reduction of environmentally negative garden practices, pest control practices and household paint usage. Citywide coverage and representation of the San Francisco population was ensured through a random-digit-dialed sample of 3850 San Francisco listed and unlisted residential telephone numbers. Aside from their garden, pest control and paint usage behavior, respondents were also asked about their awareness of water pollution and its sources, as well as the level of support for local government's efforts to improve water quality and educate the public. Information was also obtained on respondents' exposure to various media outlets. The survey findings are used in developing and retaining effective public information programs and targeting new pollution prevention strategies.

- *Tools to Measure Source Control Program Effectiveness (2000)* – Prepared by Larry Walker Associates for the Water Environment Research Federation (document D00302). San Francisco participated in this national pollution prevention case study in which a model framework of effectiveness measurement tools for pollution prevention programs was tested. The report includes cost information to implement a pollution prevention program that includes program evaluation tools for measuring effectiveness. San Francisco's demonstration project was for mercury source reduction from two different sources: dental offices and thermometers (both fever and weather) from the general public. For the dental mercury source reduction program, San Francisco mailed surveys to nearly 1,000 dentists to learn how dentists were implementing the mercury (Hg) BMPs. The mailing also included tips on dental Hg BMPs and local waste handling resources, and how to prevent Hg from entering the sewer system. Follow-up site visits were conducted to see how well the dentists were implementing the BMPs. The results of the survey and the site visits were published in the report. The thermometer ban, which is discussed in more detail below under *Mercury Thermometer Ban and Collection Program*, was also discussed in the report. San Francisco's participation in this national study helped in developing useful public participation source control strategies that are applicable to a range of commercial and residential source control programs.
- *Mercury Pollution Prevention Program Evaluation (March 2002)* - Prepared by Larry Walker Associates for Association of Metropolitan Sewerage Agencies. With a grant from EPA, AMSA implemented this study to determine whether pollution prevention or some form of source control could sufficiently reduce influent mercury levels to enable POTWs to comply with increasingly stringent limits for mercury. The project also sought to identify beneficial impacts of wastewater source control programs on other pathways by which mercury enters the environment. San Francisco was a major participant in the study. San Francisco conducted sampling of discreet waste lines from six dental office buildings ranging from 4 to 100+ dental offices to provide data for Hg load calculations. There was no obvious relationship between measured mercury loadings per dentist and which BMPs were implemented, number of patients, or number of fillings per week. The report found that mercury source control and pollution prevention programs have the potential to achieve measurable reductions in influent levels of mercury, but will not generally enable publicly owned treatment works to meet increasingly stringent mercury effluent limits. Posted at <http://www.amsa-cleanwater.org/advocacy/mercgrant>.
- *Additional Evaluations* – PUC staff are evaluating methods for conducting effectiveness evaluations of the Latex Paint Recycling Program, BMPs for Hospitals and Medical Office Buildings, Mercury Thermometer Ban and Collection Program, and the Fluorescent Lamp Collection Program.



### Household Hazardous Waste Collection Center

This facility is a very essential component in the City's efforts to keep hazardous materials out of the sewer system. San Francisco maintains a permanent collection center to which residents may take waste paints, old pesticides, batteries, and similar materials that might otherwise be discharged down sewers or storm drains. The facility accepts 15 gallons or 125 pounds of hazardous wastes from residents per trip. The facility also accepts wastes from small businesses for a fee.

### Household Hazardous Waste Pickup Service (Including Small Business Wastes)

San Francisco has implemented a Hazardous Waste Pick Up Service for Residents. This initiative provides door-to-door pickup service for used motor oil, oil filters, and latex paint. Pick-up is by appointment for all San Francisco residents and will be extended to Treasure Island.

In addition, the City provides free household hazardous waste pick-up (household chemicals, paints, pesticides, aerosols, cleaners, etc.) for elderly and disabled residents. (Other residents pay \$35.00 for service.) (More information at:

[http://www.sfrecycles.org/hazardous\\_waste/haz\\_waste\\_content/Residents/hw\\_res\\_hw\\_pkup\\_service.htm](http://www.sfrecycles.org/hazardous_waste/haz_waste_content/Residents/hw_res_hw_pkup_service.htm))

Of particular importance for keeping hazardous chemicals out of the sewers are the services provided for small businesses (very small quantity generators: VSQG). These services are available for San Francisco businesses that generate small amounts of hazardous waste (less than 27 gallons or 220 lbs. per month). The program provides them with drop off and pick up options that are legal, safe, and affordable. This program is co-sponsored by the City and Sanitary Fill Company.

### Hazardous Waste Drop-Off Sites

In addition to the Hazardous Waste Collection Center, the City has established drop-off sites for a variety of wastes which may contribute COCs if improperly disposed. These wastes include: auto tires, car batteries, cell phones, computers, household batteries, used oil, and fluorescent tubes and latex paint (these last two are also described elsewhere). More information at:

<http://www.sfrecycles.org/Directories/what.html> .

### Street Sweeping/Catch Basin Cleaning

A key BMP is the City's street sweeping program, which directly reduces pollutants originating from street surfaces including copper from brake linings, (and possibly mercury from discarded batteries); all City streets are swept on a regular basis, usually weekly, with vacuum sweepers. Some commercial areas are swept daily; low-use areas are swept monthly. Unlike some communities, San Francisco does not allow neighborhoods to "opt out" of the street sweeping

program. The City's catch basins are also cleaned, as necessary, which helps reduce pollutant loadings.

### Green Business Program

Although several City departments, including the PUC, DPH and DOE, have had programs for many years which interface with businesses and provide them with assistance and information to make their operations more "green", the City has not yet developed a coordinated, established and official Green Business Program that certifies businesses as being "environmentally friendly" based on pre-established conditions.

Beginning in FY 02-03, the following initial program development steps were taken:

- Discussions began toward establishing a formal Green Business Program for San Francisco. The WPPP is partnering with DOE/SF Environment and the SF Department of Public Health (DPH) to create the program. The initial plan is that the WPPP and DPH will conduct inspections for water pollution prevention and hazardous material/waste pollution prevention, and SF Environment will provide inspections in energy conservation, solid waste reduction, and administrative services. The SFPUC Water Department will provide water conservation services. A business will be certified as "Clean and Green" if it passes any or all of the different inspection fields, based on the type of business. The San Francisco Green Business Program is being modeled after the Association of Bay Area Government's (ABAG) Green Business Program. DPH has taken the lead on this program and has been attending ABAG Green Businesses meetings regularly for several months.
- In October 2002, the Department of Public Health held workshops as part of a Clean and Green Certification program targeting Automobile Repair Facility commercial businesses. Vehicle Service and Repair Pollution Prevention Workshops were held and 96 people, representing 42 businesses (or approximately 10% of the City's auto repair facilities) attended. Many businesses stated that they would like to be certified as a Clean & Green shop by DPH. Many municipal operations also attended these workshops (such as MUNI, Central Shops, San Francisco Airport, the clean water pump stations, the water pollution control plants, and the Housing Authority).
- (*More recent activities:* July 2003 - December 2003):
  - SF Green Business Partners meetings were held with representatives of DPH, PUC and the Department of the Environment to begin formalizing the structure of a San Francisco Green Business Program. Discussion centered around the content of the inspections and interaction between, and roles of, respective department. Copies of inspection checklists adopted by ABAG were circulated for review. Input has been requested input on what modifications might be needed in order to best suit San Francisco and its (perhaps higher) standards and goals. More meetings will be held in the upcoming months.

- DPH also continued follow through on providing education to and inspections of automobile facilities that expressed interested in the Clean and Green Certification program for auto facilities. DPH envisions that auto facilities that are inspected and certified as a Clean & Green shop will have completed the hazardous waste/toxics and water pollution prevention related review that is part of the SF Green Business certification process, which has yet to be formally adopted.

### Homepage of the WPPP

Historically, information on the WPPP had previously been available on the SFPUC main website ([www.sfwater.org](http://www.sfwater.org)) in a very limited way. Navigating the SFPUC website was also not easy. Therefore, it was difficult to refer residents and businesses to the web for program information and resources. Information on the WPPP free guides, for example, was online, but the information was located in the At Your Service/Consumer Advice section. Additionally, there was only a brief mention of the WPPP in the section on SFPUC departments, and no detail on the program's purpose, message, or resources and assistance available to City residents and businesses.

- (*More recent activities: July 2003 – December 2003*): Beginning in the 3rd quarter of 2003, the WPPP established a more visible, and easily accessed, location on the internet, as detailed below:
  - Summary of Online Presence of WPPP Initiated in 3rd Quarter 2003
  - A WPPP homepage was established at <http://pollutionprevention.sfwater.org>. This page can also be accessed through links from the SFPUC site ([www.sfwater.org](http://www.sfwater.org)) wherever the Water Pollution Prevention Program is referenced.
  - The WPPP homepage contains a statement on the program goals, what the program does, and provides links to information on specific program components – such as the Dental Mercury Reduction Program; the Gardener Calendar; the Our Water, Our World stores; and more.
  - The WPPP homepage was cited on all outreach materials developed for the launch of the Dental Mercury Reduction Program. All program outreach materials and permit application forms are available online so that dental offices can access them easily and print them as needed.
- Future plans for the WPPP homepage include the following:
  - Information on all free guides/materials and how to order them online or by phone;

- Information and support materials for programs such as the Fats, Oils and Grease programs (commercial and residential); and
- Use of the site to track response to targeted campaigns.

### Pesticide Reduction Program

Some pesticides contain mercury or copper compounds and efforts to reduce pesticide use may incidentally reduce the release of mercury and copper to the environment. The following briefly describes the San Francisco program to reduce pesticides. This program will be expanded to Treasure Island when responsibility is transferred from the Navy.

As discussed below (section on legislative initiatives) San Francisco adopted an Integrated Pest Management (IPM) ordinance in October 1996, (revised 1997) which commits the City to a pest management approach on its own property that minimizes the use of toxic chemicals and controls pests by methods that pose a lower risk to public and environmental health. For example, four-hundred goats and tons of corn meal mulch are used to help prevent weeds from taking over City parks and watersheds, giant heaters are used to kill termites inside of building walls, and donut-shaped devices floating in City ponds release mosquito-eating microorganisms. Since the ordinance has been in place, San Francisco has reduced overall pesticide and herbicide use by more than 50% and has eliminated the use of products containing the most dangerous ingredients.

All of the most dangerous pesticides were banned for City use at the beginning of 1997 and for tenants on city property at the beginning of 1998. By January 1, 2000, only those chemicals considered as "reduced risk" and consistent with an IPM program may be used on City property.

The City has also adopted a list of the pesticide products approved for use under San Francisco's Integrated Pest Management Ordinance. Products are designated as Allowed (A), Limited Use (L), and Limited Use of Special Concern (L\*). Each limited use product is accompanied by the specific circumstances under which it is approved for use.

Some of the educational materials used in this program are discussed in the Outreach section earlier in this document.

### City Legislative Action

Action by the Board of Supervisors has also supported the pollution prevention efforts. These actions have resulted in some of the programs described above.

- *Pesticide Ban Ordinance* - Ordinance No. 274-97 (revised in June 12, 1997) bans the use of all pesticides on City property by the year 2000 except for those chemicals considered as "reduced risk" and consistent with an IPM program. This is one of the toughest ordinances in the nation on pesticides.
- *Other ordinances, including the mercury thermometer ban, are described below*

### Areawide Activities

San Francisco participates in various Bay area activities directed toward pollution prevention.

- BASMAA (Bay Area Stormwater Management Agencies Association)
- BAPPG (Bay Area Pollution Prevention Group)
- The Regional Monitoring Program
- Regional Monitoring Program
- Bay Area Clean Water Agencies
- Clean Estuary Partnership , which provides support for Bay TMDL and related strategy development.

### ***Mercury Program Activities***

#### General Mercury Reduction Measures History

- In 1999 the City adopted the Environmentally Preferable Purchasing Ordinance. This ordinance established a purchasing process that results, where possible, in reductions in purchasing of items with PCBs, including mercury.
- Implementation by the SFPUC of an ongoing program to identify and replace manometers in use (and being purchased by the department) with non-mercury instruments.
- In 2001, the Mayor of San Francisco signed a letter in support of SB 633, which would have banned or restricted certain mercury-containing products.
- Establishment of the VSQG (Very Small Quantity Generator) program which is administered by the Department of the Environment. Among other things, this program encourages qualifying businesses to recycling fluorescent light tubes through the program.

#### Mercury Thermometer Program History

- Completion of a public perception survey to identify issues regarding ownership of mercury thermometers and the public's willingness to properly dispose of them.
- *Mercury Thermometer Ban* - The Supervisors passed an ordinance on May 8, 2000 banning the sale, import and manufacture of mercury thermometers (both fever and weather) within San Francisco's city and county limits. The ordinance was developed because mercury in breaking thermometers was considered the largest single household source of mercury pollution in municipal solid waste.

- Successful execution of a *Mercury Free May* event in May 2000. The event marked the passage of the mercury fever thermometer ban in San Francisco, one of the first cities in the nation to pass such legislation (see item above). Approximately 4,700 mercury thermometers were collected during this event.
- Production of a tri-fold brochure (in English, Spanish and Chinese) that promoted Mercury Free May and the nine associated temporary drop-off/exchange sites at neighborhood fire stations throughout the City.
- Establishment of a three permanent mercury thermometer exchange sites in FY 02-03 (University of California, San Francisco bookstore (UCSF); SF Department of the Environment; permanent Hazardous Waste Collection Facility). Residents receive a free digital thermometer for every mercury thermometer they turn in. Coverage by media outlets at the “grand opening” of the UCSF location.
- (*Most recent: 7/03 – 12/03*) Promotion continued of the permanent drop-off/exchange sites. Beginning in July, a print/newspaper ad began running in local papers to promote the permanent thermometer exchange program (advert: “Think we collected 6,000 mercury thermometers for our health?”)

#### Fluorescent Tube Recycling History

Mercury is an essential ingredient for most energy-efficient lamps and is used in fluorescent lamps.

- Establishment of a City-operated program to collect fluorescent tubes from municipal operations. The City’s Department of Public Health provides collection services, including boxes for packing the tubes.
- In FY 02-03, the City’s Department of the Environment received a grant from the California Integrated Waste Management Board for promotion of a residential fluorescent tube recycling program.
- Residents can transport bulbs to the Household Hazardous Waste Collection facility.
- Fluorescent Tube Recycling (7/03 – 12/03)
- (*Most recent: 7/03 – 12/03*) Continued operation of the City’s program which collects fluorescent tubes from municipal operations.

#### Dental Mercury Reduction History

- Since the early 1990s, San Francisco has been active in stakeholder processes for creating educational materials and conducting outreach to the dental community. San Francisco was a key participant in the group that created the dental mercury BMP guide *Never Down the Drain*, first published 1997 and revised in September 2002.

- Outreach to promote voluntary implementation of BMPs to San Francisco dental practices, in the form of surveys and information materials, was conducted in FY 00-01 and FY 01-02.
- Surveys were conducted to assess the level of implementation of passive (not-mandated) BMPs.
- Sampling was conducted in 1991 and 1992 to determine if voluntary BMPs were reducing concentration of mercury. The promotion of voluntary BMPs did not appear to have a significant impact of implementation practices.
- San Francisco participated in the creation of a power point presentation, entitled “Environmentally Responsible Dentistry”, through the regional BAPPG group. This presentation has been used to educate dentists and other interested parties.
- Important and ongoing partnerships were cultivated with groups such as the San Francisco Dental Society and the California Dental Association. Their support, and that of their membership, would facilitate the successful development and implementation of a Class 2 permit for dentists.
- Regular meetings were held with stakeholder groups and in Sept. 2002 San Francisco sponsored a booth at the CDA Convention in San Francisco and distributed approximately 175 *Never Down the Drain* guides.
- The WPPP conducted research on how to create a Pretreatment Program Class 2 permit for dentists to help reduce mercury loading into the City’s sewer system. Other agencies and industry experts with relevant experience were consulted in order that a sound, scientifically-based program would be developed.
- In 2002, San Francisco decided to pursue development of a program to regulate dental offices under a Class 2 wastewater discharge permit.
- (*Most Recent - 7/03 – 12/03*) In July 2003 approval was granted SFPUC Commission to proceed with the implementation of the Dental Mercury Reduction Program.
  - An initial database of dental offices was compiled (based on data from the CA Department of Consumer Affairs, the SF Tax Collector’s Office, yellow pages, and BERM’s data from past outreach to SF dentists).
  - The dental office database was refined through a mailing and Response Form designed to confirm whether each office was active and to identify the responsible party in each office.
  - A baseline collection system/truck line monitoring plan was developed, sites were identified and sampling conducted. Planning for sewer monitoring was initiated.

- Mapping of active dental offices was completed on a GIS mapping system.
- A list of BMPs that would be required of dental offices under the program was created.
- A list of approved amalgam separator models was established and a Vendor Fair was held in October 2003. This aspect of the program was run by the San Francisco Department of the Environment, in coordination with the WPPP.
- The permit application documents were completed (Permit Application Form; Sample Completed Application; Application Instructions; and other related program forms)
- A Program Overview guide was produced. This 8-page guide provided all of the basic information that dental practitioners and other interested parties would need to know about the program. Refer to attached copy of the Program Overview.
- An amalgam separator installation Rebate Program was designed and promoted to encourage offices to install separators quickly. This aspect of the program was run by the San Francisco Department of the Environment, in coordination with the WPPP.
- A written procedure was developed on the wastewater sampling and analysis methodology that would have to be followed by dental offices choosing the self-monitoring option (as opposed to installation of an amalgam separator). A special sampling device ("berglund device") was also configured and specifications developed.
- Development of a list of approved amalgam waste haulers and a summary of proper amalgam waste management practices.
- A website was established where all Dental Mercury Program related information is posted and can be downloaded.
- An informal tri-agency dental mercury group was formed (EBMUD, Palo Alto and San Francisco) to discuss lessons learned in the development of the dental mercury program.
- Press releases on San Francisco's launch of the dental mercury reduction program were issued jointly by the SFPUC and the California Dental Association in August 2003. The message was picked up by some local print and radio outlets.
- The WPPP neared completion of a dental mercury module into the



departments existing centralized Oracle database. This will allow the program to better track program actions, BMP compliance, and other metrics.

### ***Copper Program Activities***

#### General Copper Reduction Measures History

Corrosion in the potable water system plumbing has been identified consistently to be one of the largest sources of copper in wastewater.

#### Past Achievements of Copper Reduction Program

- San Francisco participated in a regional BAPPG group that produced outreach materials that could be used regionally by cities to promote BMPs which would result in less copper corrosion. The campaign aims to educate pipe system designers and installers about ways they can help reduce copper corrosion, thereby reducing the levels of copper in POTW wastewater. The campaign materials were developed so that each agency could use them to conduct outreach in their respective areas. These materials included the following:
  - 2 Fact Sheets – one for designers (“Preventing Corrosion Protects San Francisco Bay”) and one for installers/plumbers/pipefitters (“Good Plumbing Practices Protect San Francisco Bay”).
  - A give-away scratch pad for plumbers with the message “You’re the Solution to Copper Pollution” engraved on it. The pad is accompanied by a note card that explains the campaign and BMPs.
  - A power point presentation was created to be used in making presentations to pipe designers and pipe fitters. This presentation provides background information on the issue, explains how corrosion occurs and details information on BMPs to reduce copper corrosion. Survey questions were built in at the start and at the end to gauge how much the audience learned.
- (Most Recent - 7/03 – 12/03) Copper Program Achievements
  - Target audiences were identified for the copper P2 outreach materials that had been produced. A list was compiled of specific contacts for plumbing and pipefitting unions and other associations (such as plumbing engineer and corrosion engineer associations, and plumbing, heating and cooling associations). Local building inspection and planning departments were also identified as target audiences.
  - The power point presentation underwent some final revisions to make it more flexible for use by different jurisdictions.
  - The WPPP held a campaign outreach orientation meeting on September 17,

2003 where representatives from various jurisdictions were trained on how to use the campaign outreach materials. This included a walk through of power point presentation. Over 20 individuals attended.

- The WPPP provided copies of the power point presentation, the 2 fact sheets and the give-aways to representatives of regional agencies that had signed up to make presentations to the identified targeted entities.
- In November and December of 2003 the WPPP made initial contact with the identified local target audience associations. Initial information on the campaign was communicated and interest was expressed in attending association meetings to make a detailed presentation.
- Actual outreach and presentations to municipal departments and targeted associations is planned for the 1st and 2nd quarters of 2004.

### **Proposed Pollution Prevention Actions for Primary COCs**

San Francisco was developed one of the earliest pollution prevention programs in the Bay Area. It was the first program to target stormwater runoff in addition to reducing pollutants in the sanitary sewer system. The program continues to expand and investigate new opportunities to reduce pollutant loading to local waterways. This effort will continue as described in the preceding sections.

- *Ongoing and expanded pollution prevention and copper and mercury control programs* - San Francisco will continue the general activities described above including the proposed new activities. New initiatives are planned for both mercury and copper control. When appropriate these programs will be extended to Treasure Island.
- *Sewage and Storm Water Management Guidelines for New Developments* - San Francisco intends to develop goals and objectives for the development and management of new storm water and wastewater infrastructure. The guidelines will impact much of the new development on Treasure Island. These objectives are intended to be general guidelines rather than specific design parameters. The objectives developed would satisfy all applicable regulations as well as address citywide planning needs for sewage and storm water management. Further, the objectives will consider approaches taken with recent large developments at Mission Bay and Hunters Point Shipyard as well as the Port's Storm Water Management Plan for the Southern Waterfront. Lastly, the objectives should be consistent with the current and future SFPUC Long-Term Strategic Plans and the overall goals of the San Francisco Clean Water Program including control of key pollutants of concern.
- *Treasure Island Wastewater Pollution Prevention Program* - The City has prepared a draft pollution prevention program for Treasure Island (attached). This program is going through reviews and will be implemented as soon as practicable.

## General Source Identification and Control Efforts for the Other COCs

The discussion above focussed the two metals which are the primary COCs. Other efforts by the City have addressed organics including 4,4'-DDE and Dieldrin as well as cyanide

*Source Identification* - In addition to heavy metals, San Francisco has undertaken measures to identify the sources of toxic organics in the wastewater system. This work has been consolidated into the following phased effort which includes dioxins among its targeted constituents:

- *Toxic Organic Pollutant (TOP) Management Study* (Phase I began in 1995, Phase II in 1996) - This program was structured as a multi-year study with a broad scope running from TOP source identification to control measure implementation including public education. Both Phase I and Phase II included dry and wet-weather sampling throughout the collection system and at selected industrial discharges in order to identify TOP sources. Related work included surveying residents regarding pesticide use and disposal.

*Education efforts* - Many of the education and control programs discussed in preceding sections will be effective at controlling residual containers of DDT or Dieldrin that homeowners or businesses may have. The educational efforts should help increase awareness of the potential harm of these substances.

*Gardening Calendars* - These calendars contain tips on alternatives to pesticide use for home gardeners.

*Drive-Through Hazardous Waste Disposal for San Francisco Residents* - How to use the Household Hazardous Waste Facility

*Disposal programs* - The Household Hazardous Waste Collection Center is a very essential component in the City's efforts to keep hazardous materials out of the sewer system. San Francisco maintains a permanent collection center to which residents may take waste paints, old pesticides, batteries, and similar materials that might otherwise be discharged down sewers or storm drains. The facility also accepts wastes from small businesses for a fee.

Cyanide is thought to be generated in the treatment process itself so pollution prevention would not be effective. San Francisco, however, has begun implementing improved analysis methods to lower the detection limit in order to determine whether cyanide is present at levels of concern.

**Attachment:** *Treasure Island Wastewater Pollution Prevention Program*