TO: BASMAA Municipal Operations Committee

FROM: Chris Sommers, Vishakha Atre and Kristin Kerr

DATE: June 3, 2010; REVISED January 20, 2011

SUBJECT: POC Commercial/Industrial Inspector Training Material

This memorandum transmits the final work products developed for the BASMAA Muni Ops Committee’s regional project to develop training materials for stormwater inspectors to identify Municipal Regional Stormwater NPDES Permit (MRP) pollutants of concern (POC) in commercial and industrial facilities. This project was funded by in-kind contributions from the Santa Clara Valley Urban Runoff Pollution Prevention Program (SCVURPPP) and the San Mateo Countywide Water Pollution Prevention Program (SMCWPPP).

The MRP was adopted October 14, 2009 and became effective on December 1, 2009. MRP provisions that address Pollutants of Concern (POC) include C.11 Mercury Controls; C.12 Polychlorinated Biphenyls (PCBs) Controls and C.13 Copper Controls. Two of these provisions (PCBs and Copper), explicitly have requirements (sub-provisions) related to identifying POCs during commercial/industrial facility inspections, which is required under provision C.4 (Commercial and Industrial Site Controls). The third provision (Mercury Controls) does not explicitly require the identification of mercury and mercury-containing devices during inspections, but requires the promotion, facilitation and/or participation in the collection and recycling of mercury containing devices.

BASMAA provided the Draft training work products to members in early June 2010 for their use. BASMAA members provided comments and feedback on the training materials. Their comments have been incorporated into the final work products.

Scope of Work

The scope of the “Training Materials to Identify Pollutants of Concern during Commercial/Industrial Facility Inspections” project is 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 development of training materials relied on a literature review to identify existing information and meetings with municipal staff responsible for conducting or overseeing industrial/commercial stormwater inspections\(^1\). The literature review focused first on local Bay Area reports, including the Ettie Street Pump Station report (Kleinfelder, Inc. 2006) identified in the scope of work, inspection forms and BMP materials. Regulatory guidance available from EPA was reviewed for both the stormwater and wastewater pretreatment inspection areas. A limited web-search was performed to acquire readily available materials from other agencies in California or other states that could be utilized to meet project goals. A list of the informative reports, guides and BMP materials found during the literature review is provided in Attachment A. Wherever available, online links to the literature are provided.

**Training Materials**

This memorandum transmits the following training materials:

*Guidance Manual* – The Guidance Manual provides information on sources, regulations, and proper management of POCs. It will help inspectors identify PCBs, copper and mercury during inspections and educate facility operators about proper management of these pollutants of concern. The Guidance Manual is included in Attachment B (and can be downloaded at [www.basmaa.org](http://www.basmaa.org)).

*Reporting and Inspection Forms* – Attachment C includes model inspection and reporting forms. The model inspection form can be used independently or integrated into inspection forms used to meet the MRP’s business inspection requirements (*Provision C.4 Industrial and Commercial Site Controls*).

*PowerPoint Presentation for Training* – The PowerPoint presentation can be used by local stormwater supervisors to train inspectors that conduct stormwater inspections of industrial/commercial facilities. The presentation includes notes for the trainer. It is included in Attachment D.

The text below briefly describes the training material for each POC. References to BMP materials available are made in the sections below. Examples of BMP materials are also included in Attachment E.

**Pollutant of Concern: Copper**

The purpose of the MRP Provision C.13 Copper Controls is to “implement the control measures identified in the Basin Plan amendment necessary to support the copper site specific objectives in the San Francisco Bay”. Copper has been an identified pollutant of concern in San Francisco Bay since the late 1980s. In the aquatic environment, phytoplankton are among the most sensitive organisms to copper toxicity. Phytoplankton form the base of the food chain in most aquatic systems and therefore support higher trophic levels. The 1989 designation of lower South San Francisco Bay as impaired by copper (listing under section 304(l) of the Clean Water Act) caused government agencies and businesses to make a significant investment in copper source identification and copper reduction measures (TDC Environmental 2004b). As of July 2003, all San Francisco Bay segments listed for copper have been removed from the State’s 303(d) list of impaired water bodies and placed on the monitoring list (Dovzak, C., Sommers, C., 1999, Phone conversations with SCVURPPP IND Ad Hoc Task Group and SMSTOPPP staff and a meeting with BASMAA Municipal Operations committee.

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\(^1\) Phone conversations with SCVURPPP IND Ad Hoc Task Group and SMSTOPPP staff and a meeting with BASMAA Municipal Operations committee.
Significant sources of copper in urban runoff include vehicle brake pads, copper air emissions, architectural copper, industrial copper use, improper discharge of pool and spa water, domestic water discharged to storm drains, soil erosion, and copper pesticides (TDC Environmental 2004a, TDC Environmental 2004b).

MRP Provision C.13.d Industrial Sources 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 programs. As part of the industrial inspection, inspectors need to ensure that proper BMPs are in place to minimize discharge of copper in storm water, including consideration of roof runoff that might accumulate copper deposits from ventilation systems on-site.

The training materials developed for this project focus on industrial/commercial sources of copper that would be identified during routine stormwater inspections. The training materials identify industrial/commercial facilities that are potential copper pollution sources, describes BMPs that should be implemented, and provide information materials for inspectors to distribute to facility owners/operators.

Industrial/commercial activities that involve the use of copper include electroplating facilities, metal finishers, auto dismantlers and semiconductor manufacturing (SCVURPPP 1997, Dovzak, C., Sommers, C., 2004). Many of these activities occur indoors, where most copper releases would not reach stormwater runoff. However, studies have shown that these categories of industries have a potential to contribute greater concentrations of copper to stormwater runoff than other industrial/commercial facilities (SCVURPPP undated) because of copper released through roof ventilation that is deposited and then mobilized by roof stormwater runoff.

It should be noted that some of the categories identified (plating facilities, metal finishers, auto dismantlers/vehicle salvage yards) are required in Provision C.4.b. to be part of inspection program plans.

### Table 1: Industrial/commercial Facilities of Concern – NOI Filers

<table>
<thead>
<tr>
<th>SIC Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIC 3331</td>
<td>Primary Smelting and Refining of Copper</td>
</tr>
<tr>
<td>SIC 3341</td>
<td>Secondary Smelting and Refining of Non Ferrous Metals</td>
</tr>
<tr>
<td>SIC 3351</td>
<td>Rolling, Drawing, and Extruding of Copper</td>
</tr>
<tr>
<td>SIC 3471</td>
<td>Electroplating, Plating, Polishing, Anodizing &amp; Coloring</td>
</tr>
<tr>
<td>SIC 3674</td>
<td>Semiconductor manufacturing</td>
</tr>
<tr>
<td>SIC 4493 &amp; SIC 4499</td>
<td>Boat Yards/Marinas (with on-shore maintenance yards)</td>
</tr>
<tr>
<td>SIC 5015</td>
<td>Motor Vehicle Parts, Used</td>
</tr>
<tr>
<td>SIC 5093 &amp; SIC4953</td>
<td>Scrap &amp; Waste Materials, including e-waste</td>
</tr>
</tbody>
</table>


The sources of copper at these types of facilities are noted in the guidance manual with the appropriate BMPs. Current inspection practices and implementation of BMPs (e.g., good
housekeeping, secondary containment for chemical storage, etc.) meet most requirements. Example BMP material is in Attachment E.

The emphasis in MRP Provision C.13.d, and the emphasis in these training materials, is on stormwater runoff from roofs. Inspecting for potential copper deposits from roof ventilation systems and distributing BMPs and outreach materials to facility owners/operators may be a new activity for some municipalities. Example BMP materials are provided in Attachment E.

At metal finishing, electroplating and semiconductor manufacturing industries certain processes, such as heated plating tanks, could potentially release droplets of copper-containing solutions into building air exhaust systems and out onto building roofs and the surrounding area (TCD Environmental 2004a). Studies conducted by the Cities of San Jose and Sunnyvale show that metal finishing and electroplating processes contributed (through air and roof deposition) greater amounts of copper and nickel to stormwater runoff than other industrial and commercial activities (SCVURPPP 2000). Potential sources identified for copper and nickel in roof deposition included copper chloride etchers, ammonia etchers, and acid plating bath exhaust vents (City of San Jose 2004).

For more information on the BMPs, see the City of San Jose’s Fact Sheet “Is Your Roof Runoff Polluted” (City of San Jose 2004) at [http://www.scvurppp-w2k.com/cu_control_measures/Other%20Related%20Information/01_Roof%20Fact%20Sheet%2020004_sjc.pdf](http://www.scvurppp-w2k.com/cu_control_measures/Other%20Related%20Information/01_Roof%20Fact%20Sheet%2020004_sjc.pdf) and the City of Sunnyvale’s Fact Sheet entitled “Metal Finishing and Plating Industries: Is Your Roof Runoff Polluted?” (City of Sunnyvale undated). These are also provided in Attachment E.

There are commercial facilities that also have the potential to be a source of copper. Vehicle services shops (SIC 7549) and car wash facilities (SIC 7542) can also contribute copper to stormwater runoff if proper BMPs are not implemented.

Vehicle services (engine repair and service, fueling, vehicle body repair, replacement of fluids, recycling, cleaning, and outdoor equipment storage and parking (dripping engines)) can generate toxic hydrocarbons and other organic compounds, oils and greases, nutrients, phosphates, heavy metals, paints and other contaminants. Radiator repair and flushing operations are the most likely source of copper containing waste streams (SCVURPPP undated). Current inspection practices and implementation of BMPs (e.g. good housekeeping, secondary containment for waste oil, etc.) meet requirements to minimize the discharge of pollutants to the storm drain system. BMPs for these facilities are described in the guidance manual.

Vehicle break pads are a major source of copper in urban runoff (TetraTech 2004a). Vehicle wash water may contribute hydrocarbons and other organic compounds, oils and greases, nutrients, phosphates, heavy metals (including copper), and suspended solids to stormwater runoff (SCVURPPP undated). All wash water should flow to the sanitary sewer system.

**Pollutant of Concern: Mercury**

The purpose of MRP Provision C.11 Mercury Controls is to “implement the urban runoff requirements of the San Francisco Bay mercury TMDL and reduce mercury loads to make substantial progress toward achieving the urban runoff mercury load allocation established for the TMDL”. MRP Provision C.11.a Mercury Collection and Recycling Implemented throughout the Region requires Permittees to “promote, facilitate, and/or participate in collection and
recycling of mercury containing devices and equipment at the consumer level (e.g., thermometers, thermostats, switches, bulbs”).

Mercury released into the environment (through industrial processes or breakage of mercury containing materials) is transported by air, rain, snow or runoff and deposited in our creeks and Bay. Under certain conditions mercury is converted by microorganisms into its most toxic form (methylmercury), which moves up through the food chain via a process called bioaccumulation. San Francisco Bay is listed on the on the Clean Water Act (CWA) 303(d) list as “impaired” by mercury because some types of fish caught in the Bay contain mercury at concentrations that may threaten the health of humans consuming them.

Sources of mercury at industrial and commercial facilities can be broadly categorized into two areas: facilities that use mercury in processes or equipment, and facilities that have mercury containing products (included in Universal Waste Regulations\(^2\)) that need to be disposed properly. To reflect the requirements of the MRP, the Guidance Manual focuses on identifying and the proper disposal of mercury containing products in industrial and commercial facilities.

The guidance manual identifies industrial categories that are the most likely to contaminate stormwater with mercury: metal finishing/electroplating facilities (SIC 3471), auto dismantlers/recyclers (SIC 5015) (Dovzak, C., Sommers, C., 2004) and e-waste recycling/collection facilities (SIC 5093 & 4953). Current inspection practices and implementation of BMPs (e.g., good housekeeping, secondary containment, etc.) should adequately control potential mercury sources at industries that use mercury in processes.

For most industrial/commercial facilities the emphasis will be on providing information on the proper disposal of Universal Wastes containing mercury. The guidance manual includes a list of products containing mercury (e.g. fluorescent light bulbs, relays, tilt switches, batteries, thermostats, auto parts, etc.) and guidelines for their proper disposal. While most municipalities have local or regional public outreach pieces to provide guidance to residents on the proper disposal of mercury products, providing guidance to commercial facilities, as small quantity generators, on the proper disposal of mercury products may be new to some municipalities. Example BMP materials are provided in Attachment E. Information on recycling facilities can also be found on the CalRecycle website http://www.calrecycle.ca.gov/electronics/collection/RecyclerSearch.aspx.

Other useful references for mercury containing products and BMPs are:
- Mercury-Added Products Fact Sheets, (IMERC 2008);
- A Guide to Mercury Assessment and Elimination in Health Care Facilities (California DHS 2000); and
- Mercury in Buildings (Purdue University 2005)

Small business generating less than 220 lbs. of hazardous waste (including fluorescent lamps and other mercury-containing wastes) and less than 2.2 lbs. of acutely hazardous waste within any month of a calendar year, may qualify as a Conditionally Exempt Small Quantity Universal Waste Generator (CESQUWG). (As an example, one box of 36 fluorescent lamps (four-foot long tubes) weighs about 24 lbs.)

\(^2\) The Universal Waste Regulation is a state regulation that encourages proper recycling of hazardous waste. The EPA chose the word “universal” to describe the nature of certain widely dispersed hazardous wastes. These include batteries, mercury thermostats and fluorescent lamps.
CESQUWGs are not subject to the same rules for training, accumulation, and packaging of their hazardous waste that the larger hazardous waste generators are. However, they do need to follow the recycling and disposal requirements of the universal hazardous waste rules in the State of California. CESQUWGs can recycle their lamps at their local government sponsored Hazardous Waste Recycling and Disposal Programs or they can contract with a hazardous water hauler to properly dispose of their hazardous waste.

Outreach materials on spill control and proper disposal are included in Attachment E. This includes recently updated EPA guidance material for residents on proper cleanup of CFL bulbs.

**Pollutant of Concern: PCBs**

The purpose of MRP Provision C.12 Polychlorinated Biphenyls (PCBs) Controls is to “implement the urban runoff requirements of the PCBs TMDL”. MRP Provision C.12.a Implement Project throughout Region to Incorporate PCBs and PCB-Containing Equipment Identification into Existing Industrial Inspections requires Permittees to identify, in the course of their existing inspections, PCBs or PCB-containing equipment. When inspectors identify PCBs or PCB-containing equipment, they are to document incidents in inspection reports and refer to appropriate regulatory agencies (e.g., county health departments, Department of Toxic Substances Control, California Department of Public Health, and the Water Board) as necessary.

PCBs are synthetic chemicals which are no longer produced in the United States, but are still found in the environment. PCBs have been used as coolants and lubricants in transformers, capacitors, and other electrical equipment because they are good heat and electrical insulators. The manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects. Products made before 1977 that may contain PCBs include old fluorescent lighting fixtures and electrical devices containing PCB capacitors and hydraulic oils (ATSDR 2001). PCBs continued to be imported into the U.S. until the 1979 ban (Oregon DEQ 2003).

Prior to the 1979 ban, PCBs entered the environment during their manufacture and use in the United States. Today PCBs can still be released into the environment from poorly maintained hazardous waste sites that contain PCBs; illegal or improper dumping of PCB wastes; leaks or releases from electrical transformers containing PCBs; and disposal of PCB-containing consumer products into landfills not designed to handle hazardous waste. PCBs may also be released into the environment by the burning of some wastes in municipal and industrial incinerators.

Once in the environment, PCBs do not readily break down and therefore may remain for long periods of time cycling between air, water, and soil. PCBs can be carried long distances and have been found in snow and sea water in areas far away from where they were released into the environment. As a consequence, PCBs are found all over the world. In general, the lighter the form of PCB, the further it can be transported from the source of release. PCBs can accumulate in the leaves and above-ground parts of plants and food crops (USEPA undated). Similar to mercury, PCBs bioaccumulate and are found in increasing concentrations at higher trophic levels in the food chain. The levels found in certain fish present a health risk to people consuming those fish. As a result, the Bay is listed as “impaired” by PCBs on the CWA 303(d) list (SCVURPPP 2004).

**Regulations**
Congress enacted the Toxic Substances Control Act (TSCA) to control the distribution, use, and disposal of harmful chemicals, including PCBs. Through TSCA, Congress established a number of requirements for identifying and controlling toxic chemical hazards that pose risks to human health and the environment. TSCA PCBs regulations can be found in Title 40 of the Code of Federal Regulations (40 CFR) Part 761.

PCBs releases are also regulated by the Clean Air Act (CAA), Clean Water Act (CWA), and the Resource Conservation and Recovery Act (RCRA). PCBs releases are also reported in the Toxic Chemical Release Inventory (TRI). However, TSCA regulations shape the principal regulatory framework.

The guidance manual provides a summary of the regulations for labeling, storing, record keeping, disposal and PCB spill clean-up.

**Products Containing PCBs**

Although no longer commercially produced in the United States, PCBs may be present in products and materials produced before the 1979 PCB ban. Products that may contain PCBs include:

- Transformers and capacitors
- Other electrical equipment including voltage regulators, switches, reclosers, bushings, and electromagnets
- Oil used in motors and hydraulic systems
- Old electrical devices or appliances containing PCB capacitors
- Fluorescent light ballasts
- Cable insulation
- Thermal insulation material including fiberglass, felt, foam, and cork
- Adhesives and tapes
- Oil-based paint
- Caulking
- Plastics
- Carbonless copy paper
- Floor finish

The PCBs used in these products were chemical mixtures made up of a variety of individual chlorinated biphenyl components, known as congeners. Most commercial PCB mixtures are known in the United States by their industrial trade names. The most common trade name is Aroclor (USEPA undated). Other common trade names are provided in the guidance manual.

Federal TSCA requirements categorize the management and disposal of PCB-containing fluids into three groups:

- Greater than 500 parts per million (ppm) PCBs (PCB-containing)
- Between 50 and 500 ppm (PCB-contaminated)
- Less than 50 ppm (not generally TSCA regulated, although some requirements apply)

The guidance manual contains a more detailed description of the PCB containing products. Much of this product information and BMPs was taken from the U.S. EPA *PCB Inspection Manual* (USEPA 2004). The EPA manual is a very good reference document and can be used to provide further training and respond to questions, if needed. A copy of the manual can be found at
Types of facilities where PCB-containing equipment may be found are described in the guidance manual. It should be noted that owners of facilities that have a PCB transformer are required to register in the EPA’s Transformer Registration Database. The database can be accessed at [http://www.epa.gov/osw/hazard/tds/pcbs/pubs/data.htm](http://www.epa.gov/osw/hazard/tds/pcbs/pubs/data.htm). The guidance manual includes the Bay Area facilities listed in the EPA database as well as Table 2 below.

**Regulatory Agency Notifications**

The MRP requires permittees to document incidents and “refer to appropriate regulatory agencies” as necessary. We suggest that if stormwater inspectors find a problem related to PCBs or PCB-containing equipment during the course of a stormwater inspection that the agency fax the inspection report, or notify by email or phone, the following three agencies:

- **EPA Region 9:** Steve Armann, Regional PCB Coordinator, email: armann.steve@epa.gov, phone: 415-972-3352, FAX: 415-947-3530
- **Regional Water Board:** Industrial Inspection contact for Contra Costa, Michelle Rembaum-Fox, email: MRembaumfox@waterboards.ca.gov, phone: 510-622-2387, fax: 510-622-2460; Industrial Inspection contact for Alameda, San Mateo and Santa Clara Counties, Cecil Felix, email: CFelix@waterboards.ca.gov, phone: 510-622-2343, fax: 510-622-2460
- **County Department of Environmental Health or local CUPA agency**

Examples of incidents, or problems, found during a stormwater inspection may include a PCB transformer that is not registered in the EPA database, PCB-containing equipment that does not have the proper labeling, leaking PCB-containing equipment or storage drum or improper storage of PCBs.

If permittees would like more information on contacts for specific PCB incident referrals they can contact the agencies below or see additional information in the guidance manual.

**Regional EPA PCB Contacts**

Within each EPA Region, the Regional Administrator has designated Regional PCB Coordinators to oversee the development of PCB efforts within the Region. If inspectors find a PCB transformer at a facility that is not registered in the EPA database they should refer the facility to the EPA’s Regional staff for PCB Inspection and Enforcement. Also if they find PCB equipment without the proper labeling or recordkeeping they should refer the facility to the Regional PCB Inspection and Enforcement contact. The contact information for staff at EPA Region 9 is below:

- Steve Armann (Regional PCB Coordinator) - phone: 415-972-3352, FAX: 415-947-3530
- Max Weintraub (PCB Use) - phone: 415-947-4163
- Christopher Rollins (PCB Inspection and Enforcement) - phone: 415-947-4166
- Carmen Santos (PCB Cleanup) - phone: 415-972-3360, FAX: 415-947-3533

EPA Region 9 24-hour Spill Hotline: (800) 300-2193 or (415) 947-4400


**TSCA Hotline and Contact Information**

3 Phone conversation with Christopher Rollins (PCB Inspection and Enforcement staff, EPA Region 9)
Hours of operation 8:30 am to 5:00 pm Monday through Friday EST, (excluding legal holidays)
Phone: (202) 554-1404
Fax (document requests only): (202) 554-5603
E-mail: TSCA-Hotline@epa.gov

The California Department of Toxic Substance Control (DTSC) contact information for reporting violations is the complaint phone number 1-800-69-Toxic.

San Francisco Bay Regional Water Quality Control Board Contact:
Phone: (510) 622-2300, Fax: (510) 622-2460

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4 Email correspondence with Gloria Conti, Regulatory Assistance Officer, DTSC May 27, 2010.
### Table 2. Bay Area Facilities Listed in EPA’s Transformer Registration Database

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<thead>
<tr>
<th>COMPANY</th>
<th>STREET</th>
<th>CITY</th>
<th>STATE</th>
<th>ZIP</th>
<th>NO OF TRANSFORMERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stanford Linear Accelerator Center</td>
<td>2575 Sand Hill Rd</td>
<td>Menlo Park</td>
<td>CA</td>
<td>94025</td>
<td>1</td>
</tr>
<tr>
<td>Hollywood Park Land Company, LLC</td>
<td>1200 Park Place, Suite 200</td>
<td>San Mateo</td>
<td>CA</td>
<td>94403</td>
<td>1</td>
</tr>
<tr>
<td>Macaulay Foundry, Inc.</td>
<td>811 Carleton St.</td>
<td>Berkley</td>
<td>CA</td>
<td>94710</td>
<td>1</td>
</tr>
<tr>
<td>Department of the Navy, Naval Facilities Eng</td>
<td>950 West Mall Square, Suite 200</td>
<td>Alameda</td>
<td>CA</td>
<td>94501</td>
<td>1</td>
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<tr>
<td>Department of the Navy, Naval Facilities Eng</td>
<td>950 West Mall Square, Suite 200</td>
<td>Alameda</td>
<td>CA</td>
<td>94501</td>
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<td>Department of the Navy, Naval Facilities Eng</td>
<td>950 West Mall Square, Suite 200</td>
<td>Alameda</td>
<td>CA</td>
<td>94501</td>
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<tr>
<td>National Semiconductor Corporation</td>
<td>2900 Semiconductor Dr.</td>
<td>Santa Clara</td>
<td>CA</td>
<td>94087</td>
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<td>NASA</td>
<td>Ames Research Center</td>
<td>Moffett Field</td>
<td>CA</td>
<td>94035-1000</td>
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<td>NASA Ames Research Center</td>
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<td>Moffett Field</td>
<td>CA</td>
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<tr>
<td>Naval Weapons Station Seal Beach Detachment Concord</td>
<td>10 Delta Street</td>
<td>Concord</td>
<td>CA</td>
<td>94520</td>
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Source: USEPA 2007
ATTACHMENT A
Literature Review Summary


ATTACHMENT B
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.
Regulatory Background

The Municipal Regional Stormwater NPDES Permit (MRP) was adopted by the San Francisco Bay Regional Water Board on October 14, 2009. The MRP regulates stormwater discharges from municipalities and local agencies in Alameda, Contra Costa, San Mateo, and Santa Clara counties, and the cities of Fairfield, Suisun City, and Vallejo.

The MRP includes three Provisions that address Pollutants of Concern (POC): C.11 Mercury Controls; C.12 Polychlorinated Biphenyls (PCBs) Controls and C.13 Copper Controls. Two of these provisions (PCBs and Copper), explicitly have requirements (sub-provisions) related to identifying POCs during commercial/industrial facility inspections, which is required under provision C.4 (Commercial and Industrial Site Controls). The third provision (Mercury Controls) does not explicitly require the identification of mercury and mercury-containing devices during inspections, but requires the promotion, facilitation and/or participation in the collection and recycling of mercury containing devices.

MRP Provisions Requiring Inspection of Industrial/Commercial Facilities for Copper, Mercury and PCBs

Permit Provision C.12 Copper Controls 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 programs. As part of the industrial inspection, inspectors shall ensure that proper BMPs are in place such as minimizing discharge of copper to storm drains, including consideration of roof runoff that might accumulate copper deposits from ventilation systems on-site.

Permit Provision C.11 Mercury Controls requires Permittees to “promote, facilitate, and/or participate in collection and recycling of mercury containing devices and equipment at the consumer level (e.g., thermometers, thermostats, switches, bulbs).”

Permit Provision C.12 PCBs Controls requires Permittees to identify, in the course of their existing inspections, PCBs or PCB-containing equipment. When inspectors identify during inspections PCBs or PCB-containing equipment, they are to document incidents in inspection reports and refer to appropriate regulatory agencies (e.g., county health departments, Department of Toxic Substances Control, California Department of Public Health, and the Water Board), as necessary.
### Pollutant of Concern Matrix

This section identifies relevant facilities and potential sources of copper, mercury and PCBs. More details on the sources and BMPs are provided in the individual POC sections that follow.

<table>
<thead>
<tr>
<th>SIC Code</th>
<th>Facility Type</th>
<th>Potential Sources of Copper</th>
<th>Potential Sources of Mercury</th>
<th>Potential Sources of PCBs</th>
</tr>
</thead>
<tbody>
<tr>
<td>3331</td>
<td>Primary Smelting and Refining of Copper</td>
<td>Outdoor storage</td>
<td>Outdoor processes</td>
<td>Ventilation/roof runoff</td>
</tr>
<tr>
<td>3341</td>
<td>Secondary Smelting and Refining of Non Ferrous Metals</td>
<td>Outdoor storage</td>
<td>Outdoor processes</td>
<td>Ventilation/roof runoff</td>
</tr>
<tr>
<td>3351</td>
<td>Rolling, Drawing, and Extruding of Copper</td>
<td>Outdoor storage</td>
<td>Outdoor processes</td>
<td>Ventilation/roof runoff</td>
</tr>
<tr>
<td>3471</td>
<td>Electroplating, Plating, Polishing, Anodizing &amp; Coloring</td>
<td>Outdoor storage (copper compounds)</td>
<td>Outdoor processes</td>
<td></td>
</tr>
<tr>
<td>3479</td>
<td>Coating, Engraving and Allied Services</td>
<td>Outdoor storage</td>
<td></td>
<td>Outdoor processes</td>
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<tr>
<td>3499</td>
<td>Establishments primarily engaged in manufacturing fabricated metal products, not elsewhere classified</td>
<td>Outdoor storage</td>
<td></td>
<td>Outdoor processes</td>
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<td>3674</td>
<td>Semiconductor manufacturing</td>
<td>Outdoor storage</td>
<td>Outdoor processes</td>
<td>Ventilation/roof runoff</td>
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<td>Boat Yards/Marinas with on-land maintenance yards</td>
<td>Copper based anti-fouling coating</td>
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<td>Motor Vehicle Parts, Used (including Auto Dismantlers)</td>
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<td>-Switches for convenience lighting, antilock braking systems, active ride control systems -high intensity discharge headlamps background lighting in automotive displays -Vehicle fluids -crushing and scrapping vehicle bodies -recovering and recycling parts and vehicle fluids</td>
<td>Capacitors (used in cranes for picking up metal and for metal separation in recycling operations)</td>
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<tr>
<td>SIC Code</td>
<td>Facility Type</td>
<td>Potential Sources of Copper</td>
<td>Potential Sources of Mercury</td>
<td>Potential Sources of PCBs</td>
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<tr>
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<tr>
<td></td>
<td>underground vaults; Manufacturing facilities such as saw mills, pulp and paper mills, chemical manufacturing, or shipyards</td>
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<tr>
<td></td>
<td>Manufacturing industries including chemicals, high-tech, asphalt, pulp and paper, metal products such as steel tubing and die casting, adhesives, food processing, paint &amp; coatings, textiles, etc</td>
<td></td>
<td></td>
<td>Heat Transfer Systems</td>
</tr>
<tr>
<td></td>
<td>Hydraulic systems (used at steel manufacturing or die casting plants)</td>
<td></td>
<td></td>
<td>Hydraulic Fluids</td>
</tr>
<tr>
<td></td>
<td>Industrial facilities with old fluorescent lamp ballasts</td>
<td></td>
<td></td>
<td>Capacitors</td>
</tr>
<tr>
<td></td>
<td>Schools built before 1979 with old fluorescent lamp ballasts</td>
<td></td>
<td></td>
<td>Capacitors</td>
</tr>
</tbody>
</table>
Industrial/Commercial Facilities of Concern

This section identifies relevant facilities and potential sources of copper. More details on the sources and BMPs are provided in the sections that follow.

<table>
<thead>
<tr>
<th>SIC Code</th>
<th>Industrial/Commercial Facilities Description</th>
<th>Potential Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOI Filer</td>
<td></td>
<td>Outdoor storage</td>
</tr>
<tr>
<td>3331</td>
<td>Primary Smelting and Refining of Copper</td>
<td>Outdoor processes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ventilation/Roof runoff</td>
</tr>
<tr>
<td>3341</td>
<td>Secondary Smelting and Refining of Non Ferrous Metals</td>
<td>Outdoor storage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outdoor processes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ventilation/Roof runoff</td>
</tr>
<tr>
<td>3351</td>
<td>Rolling, Drawing, and Extruding of Copper</td>
<td>Outdoor storage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outdoor processes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ventilation/Roof runoff</td>
</tr>
<tr>
<td>3471</td>
<td>Electroplating, Plating, Polishing, Anodizing &amp; Coloring -</td>
<td>Outdoor storage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outdoor processes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ventilation/Roof runoff</td>
</tr>
<tr>
<td>3674</td>
<td>Semiconductor manufacturing</td>
<td>Outdoor storage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outdoor processes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Ventilation/Roof runoff</td>
</tr>
<tr>
<td>4493 &amp; 4499</td>
<td>Boat Yards/Marinas with on-land maintenance yards</td>
<td>Copper based anti-fouling coating</td>
</tr>
<tr>
<td>5015</td>
<td>Motor Vehicle Parts, Used</td>
<td>Outdoor storage</td>
</tr>
<tr>
<td>5093/ 4953</td>
<td>Scrap &amp; Waste Materials (including e-waste recyclers)</td>
<td>Outdoor storage</td>
</tr>
<tr>
<td>NOI Not Required</td>
<td>Car Washes</td>
<td>Wash water</td>
</tr>
<tr>
<td>7542</td>
<td>Automotive Services, except Repair and Carwashes</td>
<td>Radiator repair</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Flushing operations</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Dripping vehicles</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outdoor storage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outdoor operations</td>
</tr>
</tbody>
</table>
Copper Best Management Practices for Facilities

Metal Finishing, Electroplating and Semiconductor Manufacturing Industries

- **Indoor Activities**: To minimize the discharge of pollutants to the storm drain system, process activities should be conducted indoors, whenever possible with containment. Also store materials indoors, whenever possible with containment.

- **Good Housekeeping**: For any activities that occur outside (processes or material storage) use good housekeeping measures to prevent spills and leaks; properly store hazardous materials (in secondary containment, labeled and closed); and keep area clean.

- **Roof runoff**: Potential sources for copper in roof deposition included copper chloride etchers, ammonia etchers, and acid plating bath exhaust vents. Certain processes, such as heated plating tanks, could potentially release droplets of copper-containing solutions into building air exhaust system and out onto building roofs and the surrounding area (SCVURPPP, 1998). Look for chemical deposition around vents, pipes, and other roof surfaces. If discolorations or deposits are seen, steps should be taken to minimize the contamination of roof runoff. The most effective types of structural BMPs to control pollutant releases from ammonia etcher exhaust vents will vary from site to site. Some examples to consider are listed below:
  - Install vent covers and drip pans where there are none. Vent covers provide a surface for condensation of exhaust vapors and help prevent rain from entering the system. Prevent leaks in pipe fittings and containment vessels with routine maintenance.
  - Properly dispose of condensate from ventilation. Condensation in the drip pan should be plumbed to the waste treatment system or emptied into it manually.
  - If ammonia etchant vapor escapes into the atmosphere and condenses on the roof, consider promoting condensation within piping containment, such as using chiller coils at the junction of the ammonia etcher and the exhaust vent. This may also help reduce chemical loss.
  - Ammonia etchant vapors can be treated using a scrubber system. The effectiveness of the scrubber system depends on the type of scrubber solution used, and plain water appears to be ineffective. Check that your scrubber solution is appropriate for the chemistry of the fumes. A dilute sulfuric acid solution seems to be the most effective means of treating exhaust vapor from an ammonia etcher.

Vehicle Service Shops

- To minimize the discharge of pollutants to the storm drain system, vehicle service activities should be conducted indoors, whenever possible with containment.
- If vehicles fluids must be removed outdoors, drip pans should be used to capture fluids. In addition, facility operators should use other good housekeeping measures to minimize the generation of pollutants near and within vehicle service areas.
- Good housekeeping measures include keeping a clean, dry shop; preventing spills and leaks; properly storing hazardous materials (in secondary containment, labeled and closed); and practicing waste reduction and recycling.
Vehicle Washing

- All wash water should flow into the sanitary sewer system.

Boat Maintenance

- Good housekeeping BMPs applied during on-shore maintenance activities where copper-based biocide anti-fouling coatings are applied (e.g. proper storage, spill prevention and clean-up).
# Mercury

## Industrial/Commercial Facilities of Concern

This section identifies relevant facilities and potential sources of mercury. More details on the sources and BMPs are provided in the sections that follow.

<table>
<thead>
<tr>
<th>SIC Code</th>
<th>Industrial/Commercial Facilities Description</th>
<th>Potential Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOI Filer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3471</td>
<td>Electroplating, Plating, Polishing, Anodizing &amp; Coloring</td>
<td>Outdoor storage</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Outdoor processes</td>
</tr>
<tr>
<td>5015</td>
<td>Motor Vehicle Parts, Used</td>
<td>Switches for convenience lighting,</td>
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<tr>
<td></td>
<td></td>
<td>antilock braking systems, active ride</td>
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<tr>
<td></td>
<td></td>
<td>control systems</td>
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<tr>
<td></td>
<td></td>
<td>high intensity discharge headlamps</td>
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<tr>
<td></td>
<td></td>
<td>background lighting in automotive</td>
</tr>
<tr>
<td></td>
<td></td>
<td>displays</td>
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<tr>
<td></td>
<td></td>
<td>Vehicle fluids</td>
</tr>
<tr>
<td></td>
<td></td>
<td>crushing and scrapping vehicle bodies</td>
</tr>
<tr>
<td></td>
<td></td>
<td>recovering and recycling parts and</td>
</tr>
<tr>
<td></td>
<td></td>
<td>vehicle fluids</td>
</tr>
<tr>
<td>5093/ 4953</td>
<td>Scrap &amp; Waste Materials (including e-waste recyclers)</td>
<td>Outdoor storage</td>
</tr>
<tr>
<td>806X</td>
<td>Hospitals</td>
<td>Thermometers</td>
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<td></td>
<td></td>
<td>Sphygmomanometers (blood pressure monitors)</td>
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<td></td>
<td>Esophageal dilators</td>
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<tr>
<td></td>
<td></td>
<td>Cantor tubes &amp; Miller Abbott tubes (used to clear intestinal obstructions)</td>
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<tr>
<td></td>
<td></td>
<td>Feeding tubes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Laboratory chemicals (fixatives, stains, reagents, preservatives)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Medical batteries</td>
</tr>
<tr>
<td>Commercial/ Industrial Facilities</td>
<td>Mercury containing products (included in Universal Waste Regulations(^1))</td>
<td>improperly disposed</td>
</tr>
</tbody>
</table>

\(^1\) The Universal Waste Regulation is a state regulation that encourages proper recycling of hazardous waste. The EPA chose the word “universal” to describe the nature of certain widely dispersed hazardous wastes. These include batteries, mercury thermostats and fluorescent lamps.
## Mercury Containing Products at Industrial/Commercial Facilities

<table>
<thead>
<tr>
<th>Mercury Containing Products</th>
<th>Types</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluorescent light bulbs</td>
<td>Linear (straight), U-tube (bent), and circline (circular) fluorescent lamps/tubes; bug zappers; tanning lamps; black lights; germicidal lamps; high output lamps; cold-cathode fluorescent lamps; and compact fluorescent lamps</td>
</tr>
<tr>
<td>High intensity discharge (HID) Lights</td>
<td>Metal halide, high pressure sodium, and mercury vapor lamps</td>
</tr>
<tr>
<td>Other types of lighting</td>
<td>Mercury xenon short-arc lamps, Mercury capillary lamps, Mercury short-arc lamps, Neon lights</td>
</tr>
<tr>
<td>Relays and tilt switches</td>
<td>Switches - float switches, tilt switches, pressure switches, temperature switches, silent light switches and flame sensors Relays - mercury displacement relays, mercury wetted reed, and mercury contact relays</td>
</tr>
<tr>
<td>Batteries</td>
<td>Silver Oxide button-cell batteries, Zinc Air miniature batteries, Alkaline Manganese Oxide button-cell batteries (Other batteries, such as AAA, AA, C, and D alkaline; atomic; and lithium-ion batteries, do not contain mercury.)</td>
</tr>
<tr>
<td>Thermostats</td>
<td>Mercury containing</td>
</tr>
<tr>
<td>Measuring Devices</td>
<td>Thermometers, manometers and barometer</td>
</tr>
<tr>
<td>Auto Parts</td>
<td>Mercury switches are used for convenience lighting, antilock braking systems and active ride control systems. These mercury switches are being phased out, but may be present in older vehicles</td>
</tr>
<tr>
<td>Wiring Devices</td>
<td>Rectifiers and oscillators</td>
</tr>
</tbody>
</table>
Pictures of Mercury Containing Devices

Fluorescent Light Bulbs

Tubular and Circuline lamps

Compact Fluorescent bulbs

Tanning Lamps

Germicidal Lamps

High intensity discharge (HID) Lights

Metal Halide Lamp

High Pressure Sodium Lamps

Mercury Vapor Lamp
Other types of lighting

- Mercury Short Arc Metal Halide Lamp
- Mercury Capillary Lamps
- Mercury Xenon Short-Arc Lamps
- Neon Lights

Relays and Tilt Switches

- Float Switch from Sump Pump
- Tilt Switch from Washing Machine
- Mercury Displacement Relay
Mercury Wetted Relay

Flame Sensor from gas range

Mercury Contact Relay

Batteries – standard mercury battery, alkaline batteries

Zinc Air Miniature Batteries

Silver Oxide Button Cell Batteries

Alkaline Manganese Oxide Button-Cell

Thermostats

Mercury Thermostat

Mercury Switch inside thermostat

Mercury Thermostat
Measuring Devices

Barometer
(source NEWMOA)

Manometer
(source Cuoco & Cormier Engineering)

Lab thermometers
(Source: Sargent-Welch)
Best Management Practices

Metal Finishing/Electroplating and Auto Dismantler/Recycler Facilities

Facilities that use mercury in its manufacturing processes or encounter mercury as part of vehicle dismantling and recycling need to use good housekeeping and chemical storage BMPs.

Mercury Containing Products Disposal

Small business generating less than 220 lbs. of hazardous waste (including fluorescent lamps and other mercury-containing wastes) and less than 2.2 lbs. of acutely hazardous waste within any month of a calendar year, may qualify as a Conditionally Exempt Small Quantity Universal Waste Generator (CESQUWG). (As an example, one box of 36 fluorescent lamps (four-foot long tubes) weighs about 24 lbs.)

CESQUWGs are not subject to the same rules for training, accumulation, and packaging of their hazardous waste that the larger hazardous waste generators are subject. However, they do need to follow the recycling and disposal requirements of the universal hazardous waste rules in the State of California. CESQUWGs can recycle their lamps at their local government sponsored Hazardous Waste Recycling and Disposal Programs or they can contract with a hazardous water hauler to properly dispose of their hazardous waste.

Inspectors can find e-waste recycling facilities using the CalRecycle search page http://www.calrecycle.ca.gov/electronics/collection/RecyclerSearch.aspx. This information can be used to inform businesses of where some mercury containing products can be recycled, and to identify e-waste facilities in your service area for stormwater inspections.

Mercury Containing Products Proper Spill Cleanup

- Never touch mercury with bare hands
- Never use vacuum cleaners or brooms to clean up mercury spills
- Use cardboard pieces, a squeegee, or an eyedropper to gather and draw up the mercury
- Place the mercury and the items used to clean up the spill in a bag and dispose off as hazardous waste.

The EPA recently updated their guidance for residents on how to clean up a compact fluorescent light (CFL) bulb if it breaks (http://www.epa.gov/cfl/cflcleanup.html).
Regulations Governing the Distribution, Use, and Disposal of PCB Containing Equipment

Congress enacted the Toxic Substances Control Act (TSCA) to control the distribution, use, and disposal of harmful chemicals, including PCBs. Through TSCA, Congress established a number of requirements for identifying and controlling toxic chemical hazards that pose risks to human health and the environment.

PCBs releases are also regulated by the Clean Air Act (CAA), Clean Water Act (CWA), and the Resource Conservation and Recovery Act (RCRA). PCBs releases are also reported in the Toxic Chemical Release Inventory (TRI). However, TSCA regulations shape the principal regulatory framework.

Current Authorized Uses of PCBs

The table below describes the current authorized uses of PCBs

<table>
<thead>
<tr>
<th>Use</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transformers</td>
<td>Authorized use at any concentration though restrictions and regulatory requirements increase with higher PCB concentration thresholds.</td>
</tr>
<tr>
<td>Railroad Transformers</td>
<td>Transformers used in locomotives and self-propelled railcars. Authorized use at &lt; 1,000 ppm; &lt; 50 ppm if transformer coil is removed at any time.</td>
</tr>
<tr>
<td>Heat transfer systems, hydraulic systems, mining equipment</td>
<td>Authorized use at &lt; 50 ppm</td>
</tr>
<tr>
<td>Natural gas pipelines</td>
<td>Authorized at &lt; 50 ppm, or at &gt; 50 ppm with additional requirements. PCBs may be present in natural gas compressors, scrubbers, filters, and in condensate.</td>
</tr>
<tr>
<td>Research &amp; Development</td>
<td>Authorized primarily for purposes relating to environmental analysis, management, and disposal of PCBs. R&amp;D for PCB products is prohibited.</td>
</tr>
<tr>
<td>Scientific Instruments</td>
<td>Examples include oscillatory flow birefringence &amp; viscoelasticity instruments for the study of the physical properties of polymers, microscopy mounting fluids, microscopy immersion oil, and optical liquids.</td>
</tr>
<tr>
<td>Carbonless copy paper</td>
<td>Use of existing carbonless copy paper is permitted; manufacturing of new carbonless copy paper is not authorized.</td>
</tr>
</tbody>
</table>


### Use

<table>
<thead>
<tr>
<th>Use</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Electromagnets, switches, voltage regulators, circuit breakers, reclosers, cable</td>
<td>No restrictions on existing use; restrictions on PCB concentrations if serviced and oil is removed or replaced.</td>
</tr>
<tr>
<td>Porous surfaces</td>
<td>EPA considers building materials, such as concrete, porous with respect to PCB leaks and spills. Porous building materials may be left in place following spills provided various conditions are met. Older industrial machinery often was designed to slowly leak (PCB-containing) hydraulic oil as a lubricant.</td>
</tr>
</tbody>
</table>

Source: EPA (2002)

### Labeling

Labels are required on in-use or stored PCB-containing equipment (except for small capacitors) and signs are required at the storage areas used for PCB wastes and in access areas to any PCB transformers. Labels can have yellow or white backgrounds.

![Large PCB Mark (M)](image)

### Storage

The storage and disposal regulations of TSCA require specific approaches for PCB waste cleanup, storage location and duration (items must be removed from storage for disposal within 9 months and must be destroyed within 1 year), landfill and incineration disposal, and decontamination and recycling. The Office of Solid Waste and Emergency Response (OSWER) manages the EPA PCB cleanup and disposal program.
The Permitted PCB Storage Facilities in EPA Region 9 are listed below:

**Chemical Waste Management**
35251 Old Skyline Road
Kettleman City, CA 93239
Ph: 509-386-9711

**Earth Protection Services**
10 South 48th Street, Suite 4
Phoenix, AZ 85040
Ph: 602-353-9282

**Lighting Resources**
1522 East Victory Street Suite 4
Phoenix, AZ 85040
Ph: 602-276-4278

**Clean Harbors Environmental Services**
5756 Alba Street
Los Angeles, CA 90058
Ph: 323-277-2500

**US Ecology, Inc P.O. Box 578**
Beatty, NV 89003
Ph: 800-239-3943

**Onyx Environmental Services, Inc.**
5736 West Jefferson
Phoenix, AZ 85043
Ph: 602-233-2955

Record keeping

TSCA record-keeping provisions require that owners maintain the following information:

- weight of the PCBs;
- identification of PCB-containing items;
- dates of storage, transfer and disposal; and
- names of shippers and receivers.

The generator (owner) is responsible for manifesting all PCB containers shipped off-site for disposal, for verifying that PCB containers have been disposed of properly and for maintaining a signed copy of the manifest. Certificates of disposal alone are insufficient. If the generator stores at least 45 kgs of PCBs in a PCB container or, one or more PCB transformers, or 50 or more large high or low voltage PCB capacitors, then an annual document log of required records (e.g., manifests, certificates of disposal, inspection and cleanup records) must be maintained.

**PCB Spill Clean-up and Reporting**

The TSCA PCB cleanup and spill reporting requirements are complicated because they may vary according to the source, volume and location of a spill. It is recommended that facilities refer to the TSCA PCB regulations before taking any spill cleanup and reporting actions. All spills involving 1 pound or more by weight of PCBs must be reported to the National Response Center (1-800-42408802). In most other cases, where a spill directly contaminates surface water, sewers, drinking water supplies, and grazing lands, the responsible party should notify the appropriate EPA regional office and obtain guidance for appropriate cleanup measures within 24 hours after discovery.

According to TSCA’s reporting requirements for PCB spills at concentrations of 50 ppm or greater, cleanup must be documented with sampling records and certification, and the documentation must be maintained for 5 years. Depending on the location and/or volume of spilled material, certain spills
must have cleanup initiated and be reported to EPA as soon as possible and within either 24 or 48 hours. For example, for PCB transformer leaks, cleanup must be initiated as soon as possible and within 48 hours of discovery. Any TSCA PCB reporting requirements are in addition to reports required under other applicable environmental laws, such as the Clean Water Act and the Comprehensive Environmental Response, Compensation, and Liability Act.

Disposal of PCB containing materials

Permitted Disposal Facilities in EPA Region 9 are below:

<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>300 E Mallard Dr., Suite 300, Boise, ID 83706</td>
<td>35251 Old Skyline Road, Kettleman City, CA 93239</td>
</tr>
<tr>
<td>Phone: 1.800.590.5220</td>
<td>Phone: (559) 386-9711</td>
</tr>
<tr>
<td>Fax: (208) 331.7900</td>
<td>Fax: (559) 386-6109</td>
</tr>
</tbody>
</table>

Products Containing PCBs

PCBs may be present in the following products and materials produced before the 1979 PCB ban:

- Transformers
- Capacitors
- Other electrical equipment including voltage regulators, switches, reclosers, bushings, and electromagnets
- Oil used in motors and hydraulic systems
- Old electrical devices or appliances containing PCB capacitors
- Fluorescent light ballasts
- Cable insulation
- Thermal insulation material including fiberglass, felt, foam, and cork
- Adhesives and tapes
- Oil-based paint
- Caulking
- Plastics
- Carbonless copy paper
- Floor finish

The PCBs used in these products were chemical mixtures made up of a variety of individual chlorinated biphenyl components, known as congeners. Most commercial PCB mixtures are known in the United States by their industrial trade names. The most common trade name is Aroclor. One of these common trade names of the PCB fluid may be listed on a manufacturer’s label: Aroclor, Askarel, Eucarel, Pyranol, Dykanol, Clorphen, Clarolin, Chlorextol, Diaclor, Hyvol, Asbestol, Inerteen, Elemex, Saf-T-Kuhl, No-Flanol, Nepolin, or EEC-18.
Federal TSCA requirements categorize the management and disposal of PCB-containing fluids into three groups:

- Greater than 500 parts per million (ppm) PCBs (PCB-containing)
- Between 50 and 500 ppm (PCB-contaminated)
- Less than 50 ppm (not generally TSCA regulated, although some requirements apply)


**PCB Transformers**

Transformers increase or decrease the voltage level of an electric current. Electrical transformers are often filled with a dielectric liquid that increases the resistance of the unit to arcing and acts as a heat transfer medium, helping to cool the coils. Today, most transformers are filled with mineral oil or silicone. The EPA defines PCB Transformers as “any transformer containing greater than 500 ppm PCBs”. Owners of facilities that have a PCB transformer are required to register at the EPA’s Transformer Registration Database. The database can be accessed at [http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/data.htm](http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/data.htm). Table 6 below presents the Bay Area facilities listed in the EPA database.

The majority of PCB transformers are found at utilities, distribution substations or generating facilities. They may also be found at industries with high power requirements (electrical substations, steel, automotive, mining, transportation, etc.)

**Known industrial sites with PCB-containing transformers in Santa Clara, San Mateo, Contra Costa and Alameda Counties**

<table>
<thead>
<tr>
<th>Company</th>
<th>Address</th>
<th>City</th>
<th>State</th>
<th>Zip Code</th>
<th># of Transformers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stanford Linear Accelerator Center</td>
<td>2575 Sand Hill Rd</td>
<td>Menlo Park</td>
<td>CA</td>
<td>94025</td>
<td>1</td>
</tr>
<tr>
<td>Hollywood Park Land Company, LLC</td>
<td>1200 Park Place, Suite 200</td>
<td>San Mateo</td>
<td>CA</td>
<td>94403</td>
<td>1</td>
</tr>
<tr>
<td>Macaulay Foundry, Inc.</td>
<td>811 Carleton St.</td>
<td>Berkeley</td>
<td>CA</td>
<td>94710</td>
<td>1</td>
</tr>
</tbody>
</table>
PCB Transformers require service periodically and repair when out-of-order. Maintenance includes sampling fluid to test dielectric strength, topping off fluid (historically a source of PCB contamination), replacing gaskets, bushings, insulators, etc., which may involve partial draining of the unit, removing and filtering the dielectric liquid and refilling the unit, removing PCB liquid and refilling with replacement dielectric fluid and generating waste liquid, contaminated rags, equipment, etc. Any PCBs removed during any servicing activity must be captured and either reused as dielectric fluid or disposed of properly. Any wastes generated during maintenance should also be disposed of in accordance with the regulations.

PCB Transformers can be re-classified by retrofilling them with dielectric fluid that has lower concentrations of PCBs. Guidelines are available at http://www.epa.gov/oecaerth/resources/publications/monitoring/tsca/manuals/pcbinspect/pcbinspectappn.pdf

Capacitors

Capacitors regulate the flow of electric current. PCBs were the dielectric fluid used in approximately 95 percent of U.S.-produced, liquid-impregnated capacitors manufactured prior to 1978. The regulations require that all capacitors be disposed of as a PCB Capacitor except when a specific capacitor is known...
not to contain PCBs based on a label or nameplate, manufacturers’ literature, or chemical analysis. To assist in this determination, EPA regulations required all non-PCB, large low voltage capacitors, small capacitors, and fluorescent light ballasts manufactured between July 1, 1978, and July 1, 1998 bear a "No PCBs" label.

There are two general types of capacitors containing PCBs: (1) capacitors built into electrical equipment, such as fluorescent lights, televisions, and small motors, which are smaller in size; and (2) capacitors used as separate units in electrical power distribution systems, which are larger in size (see picture).

Capacitors may be located at electric utilities (usually distribution substations), manufacturing (large motors or pump stations), subway systems and mines.

Hydraulic Systems

Hydraulic systems are machines that operate using the force exerted by pressurized and confined liquid. Many steel manufacturing and die casting plants used PCBs in hydraulic systems to reduce fire hazards for machines that handled hot metals. These systems included hydraulic systems for metal dye casting equipment, trim presses, induction hardening machines, heat treating furnaces, forge furnaces, and forge presses.

The PCB regulations authorize the use of hydraulic systems containing PCBs below 50 ppm. Owners drained and flushed hydraulic systems in an attempt to reduce PCB contamination. However, systems may still be contaminated with residual PCBs that remained after refilling with non-PCB fluid. Hydraulic systems normally leak several times their capacity each year because the fluid is often pressurized to several thousand pounds per square inch causing the system to leak at connection joints and piston rings.

Fluorescent Light Ballasts

Light ballasts are the primary electric components of fluorescent light fixtures and are generally located within the fixture under a metal cover plate. The PCBs are located in the light ballasts’ small capacitor or in the potting material, the insulating material inside the ballast.
Since 1978, EPA has required manufacturers of fluorescent light ballasts to mark ballasts that do not contain PCBs with the statement “No PCBs.” Inspectors should assume that light ballasts contain PCB small capacitors if they were manufactured before 1978 or do not have a “No PCBs” statement. Please note that after July 1, 1998, fluorescent light ballast manufacturers are no longer required to mark fluorescent light ballasts with the statement “No PCBs.”

EPA has guidance for school administrators and maintenance personnel at schools built before 1979 that have not undergone a major renovation (http://www.epa.gov/epawaste/hazard/tsd/pcbs/pubs/ballasts.htm).

**Heat Transfer Systems**

Heat transfer systems use fluids of high heat capacity to remove unwanted heat or to transfer heat from one place to another within a system. They are commonly used to provide heat in chemical manufacturing where temperatures greater than that provided by steam are needed. Heat transfer systems in certain applications used PCBs as a heat transfer fluid. Heat transfer systems that contained PCB fluid were refilled with non-PCB fluid approximately 90 percent of the time. Despite this refilling, most systems contained residual PCBs. Leaks usually occur through pump motor seals.

**Natural Gas Pipelines**

A number of gas pipeline companies used PCBs as a working fluid in their compressors between 1950 and the early 1970’s. Current regulations authorize the use of PCBs in natural gas pipelines at concentrations of less than and greater than 50 ppm PCBs under certain conditions.

**Electric Motors**

In the late 1960s and early 1970s, Reliance Electric for Joy Manufacturing Company manufactured electric motors that contained PCBs.

Mining machine electric motors used on certain underground continuous loaders built by Joy contain PCBs as a coolant fluid in the large cutting head motors and traction motors. Previous versions of the regulations established a deadline of January 1, 1982, for phasing-out the use of these motors. The current regulations allow the use of PCB-containing mining equipment only under 50 ppm.

Submersible well pump motors manufactured before 1979 may contain up to five ounces of PCB dielectric fluid in their capacitors. PCBs may leak out of these submersible well pump motors during normal wear-and-tear or when the pump suddenly fails due to lightening strikes or electrical failures or shorts. A list of manufacturer’s models and serial numbers of submersible pumps that may contain PCBs is available in the EPA PCB Inspection Manual (August 2004).

**Electromagnets**

Regulations prohibit servicing, including rebuilding, of PCB electromagnets with a PCB concentration of 500 ppm or greater when the servicing or rebuilding requires the removal of internal components.
Other Products Containing PCBs

Other products manufactured before 1979 that may contain PCBs include:

- Investment casting wax
- Carbonless copy paper
- Resins
- General sealants and coatings, including windshield sealant and silo sealant
- Lubricants, including bridge bearings and additives to transmission fluids
- Paint, including marine paint
- Electrical cable insulation (If electrical cable contains liquids or damp insulation, PCBs should be suspected.)
- Gaskets roofing materials

Best Management Practices

1) Employees should be aware of PCB equipment labeling, storage, reporting, record keeping and spill control requirements. Insufficient knowledge by workers of hazards can lead to the following:
   - Spread of contamination through insufficient protective clothing and equipment
   - Improper handling techniques
   - Improper disposal of defective PCB-containing and/or PCB-contaminated equipment.

2) PCB-containing and/or PCB-contaminated equipment should be stored properly per TSCA regulations.

3) Contaminated rags, filter media, and debris gathered during cleanup operations and contaminated soils should be disposed of properly.

4) Spill containment provisions should be employed in work pits/servicing areas. Poor housekeeping and improper storage can also lead to PCB spills. In addition, spills can occur in the following operations:
   - Maintenance operations
   - Decontamination operations
   - Transport operations
   - Draining, refilling operations
   - Contamination of waste oil
   - Disconnection/disassembly of railroad transformers

5) Equipment should be inspected for leaks. Some causes of leaks are listed below:
   - Normal wear of equipment in service (e.g., valves, gaskets, and fittings)
   - Malfunctioning equipment
   - Dismantling/reassembly of equipment
   - Damaged equipment
   - Cracked or damaged transformer bushings
• Containers used for storage and transport
• Equipment stored for disposal or reuse

6) Dielectric fluids with low PCBs content should be considered while retrofilling transformers.

**Regulatory Agencies for Referrals**

The MRP requires permittees to document incidents and "refer to appropriate regulatory agencies" as necessary. Examples of incidents, or problems, found during a stormwater inspection may include a PCB transformer that is not registered in the EPA database, PCB-containing equipment that does not have the proper labeling, leaking PCB-containing equipment or storage drum or improper storage of PCBs.

If stormwater inspectors find a problem related to PCBs or PCB-containing equipment during the course of a stormwater inspection that the agency fax the inspection report, or notify by email or phone, the following three agencies:

- **EPA Region 9**: Steve Armann, Regional PCB Coordinator, email: armann.steve@epa.gov, phone: 415-972-3352, FAX: 415-947-3530
- **Regional Water Board**: Industrial Inspection contact for Contra Costa, Michelle Rembaum-Fox, email: MRembaumfox@waterboards.ca.gov, phone: 510-622-2387, fax: 510-622-2460; Industrial Inspection contact for Alameda, San Mateo and Santa Clara Counties, Cecil Felix, email: CFelix@waterboards.ca.gov, phone: 510-622-2343, fax: 510-622-2460
- **County Department of Environmental Health** or local CUPA agency

For more detailed information on agencies that may be notified for specific incidents the following provides some additional information and contacts.

Within each EPA Region, the Regional Administrator has designated Regional PCB Coordinators to oversee the development of PCB efforts within the Region. The Region 9 PCB Program regulates the processing, distribution, use, cleanup, storage and disposal of PCBs under the Toxic Substances Control Act (TSCA) in Arizona, California, Hawaii, Nevada and Pacific Territories, and also provides support for TSCA compliance. The contact information for staff at EPA Region 9 is below:

Steve Armann (Regional PCB Coordinator) - phone: 415-972-3352, FAX: 415-947-3530
Max Weintraub (PCB Use) - phone: 415-947-4163
Christopher Rollins (PCB Inspection and Enforcement) - phone: 415-947-4166
Carmen Santos (PCB Cleanup) - phone: 415-972-3360, FAX: 415-947-3533
Region 9 FAX - 415-947-3583
EPA Region 9 24-hour Spill Hotline: (800) 300-2193 or (415) 947-4400

If inspectors find a PCB transformer at a facility that is not registered in the EPA database or PCB equipment without the proper labeling or recordkeeping they should refer the facility to the PCB Inspection and Enforcement staff. More information can be found at http://www.epa.gov/region9/toxic/pcb/index.html

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**PCBs**

**BMPs**

**Agency Referrals**
The TSCA reporting requirements for spills and leaks are fairly complicated and depend on the quantity, location, extent of spill. The facility owner is responsible for clean-up within a specified time period, notifying the EPA and documenting incidents.

The California Department of Toxic Substances Control (DTSC) contact information for reporting violations is the phone number 1-800-69-Toxic. They will discern what type of violation it is and file a report. An enforcement staff person reviews the report to determine which agency or department has oversight.

The table below presents the list of incidents that may require the stormwater inspector to refer the facility to an appropriate regulatory agency.

<table>
<thead>
<tr>
<th>Incident</th>
<th>Agency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unmarked PCB Containing Equipment (PCB concentration &gt; 500 ppm)</td>
<td><strong>EPA Region 9</strong>&lt;br&gt;Christopher Rollins (<a href="mailto:rollins.christopher@epa.gov">rollins.christopher@epa.gov</a>)&lt;br&gt;PCB Enforcement Officer&lt;sup&gt;2&lt;/sup&gt;&lt;br&gt;Phone (415) 947-4166</td>
</tr>
<tr>
<td>Unregistered PCB Transformers (PCB concentration &gt; 500 ppm)</td>
<td><strong>EPA Region 9</strong>&lt;br&gt;Christopher Rollins (<a href="mailto:rollins.christopher@epa.gov">rollins.christopher@epa.gov</a>)&lt;br&gt;PCB Enforcement Officer&lt;br&gt;Phone (415) 947-4166</td>
</tr>
<tr>
<td>Improper Storage of PCB Equipment</td>
<td><strong>Department of Toxic Substances Control</strong>&lt;br&gt;Complaints line 1-800-69-Toxic</td>
</tr>
<tr>
<td>Storing of PCB equipment in any location where human food or animal feed&lt;sup&gt;3&lt;/sup&gt; products could be exposed to PCBs released from it.</td>
<td><strong>County Department of Public Health</strong></td>
</tr>
</tbody>
</table>

---

<sup>2</sup> You may contact Christopher Rollins for questions relating to PCB enforcement and inspections other than PCB use or reuse activities.

<sup>3</sup> EPA considers human food or animal feed to include items regulated by the U.S. Department of Agriculture or the Food and Drug Administration as human food or animal feed; this includes direct additives. Food or feed is excluded from this definition if it is used or stored in private homes.
<table>
<thead>
<tr>
<th>Incident</th>
<th>Agency</th>
</tr>
</thead>
</table>
| Disposal of PCB contaminated items or soil | **Department of Toxic Substances Control**  
Complaints line 1-800-69-Toxic |
| | **EPA Region 9**  
Christopher Rollins (rollins.christopher@epa.gov)  
PCB Enforcement Officer  
Phone (415) 947-4166 |
| Leaks/spills involving 454 g (1lb) or more of PCB to the environment | **National Response Center**: 1-800-424-8802 |
| Leaks/spills involving any amount of PCBs if they contaminate surface waters, sewers, drinking water supplies, grazing land, or vegetable gardens. | **EPA Region 9 24-hour Spill Hotline**: (800) 300-2193 or (415) 947-4400  
**California Emergency Services Warning Center**:  
(800) 852-7550 or (916) 845-8911  
**Water Board**: (510) 622-2369 |
| Spills involving more than 10 pounds of PCBs | **EPA Region 9 24-hour Spill Hotline**: (800) 300-2193 or (415) 947-4400 |
| Leaks/Spills less than 454 g (1lb)/Very small spills | **TSCA - (202) 554-1404**  
E-mail: TSCA-Hotline@epa.gov |

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4 “Spill” is defined in Title 40 CFR 761.123 as "both intentional and unintentional spills, leaks, and other uncontrolled discharges where the release results in any quantity of PCBs running off or about to run off the external surface of the equipment or other PCB source, as well as the contamination resulting from those releases. This policy applies to spills of 50 ppm or greater PCBs. The concentration of PCBs spilled is determined by the PCB concentration in the material spilled as opposed to the concentration of PCBs in the material onto which the PCBs were spilled. Where a spill of untested mineral oil occurs, the oil is presumed to contain greater than 50 ppm, but less than 500 ppm PCBs and is subject to the relevant requirements of this policy."
ATTACHMENT C
Reporting Forms
### Annual Report Format Excerpt – Provision C.11 Mercury Controls

<table>
<thead>
<tr>
<th>C.11.a.i ► Mercury Recycling Efforts</th>
</tr>
</thead>
<tbody>
<tr>
<td>List below or attach lists of efforts to promote, facilitate, and/or participate in collection and recycling of mercury containing devices and equipment at the consumer level (e.g., thermometers, thermostats, switches, bulbs).</td>
</tr>
</tbody>
</table>

**Recommended annual reporting approach:**
In addition to residential efforts, describe your commercial/industrial efforts related to your stormwater program. For example, report the mercury POC training your stormwater inspectors received, the date of the training, and how many inspectors received the training. If available, cite the BMP material distributed at facilities with mercury containing products.

### Annual Report Format Excerpt – Provision C.13 Copper Controls

<table>
<thead>
<tr>
<th>C.13.d.iii ▶ Industrial Sources Copper Reduction Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>List below or attach annotated lists or tables from your Industrial and Commercial Site Controls portion of this report, that highlight copper reduction results among the facilities identified as potential users or sources of copper, facilities inspected, and BMPs addressed. For FY09-10 describe below or highlight in the C.4 Evaluation portion (if provided) of this report the steps taken to revise your program to meet new data tracking and reporting requirements for implementation levels described in C.13.d.ii.</td>
</tr>
</tbody>
</table>

**Summary**

**Recommended annual reporting approach:**
Report the number of industries identified in your municipality likely to use copper or have sources of copper. If appropriate, list by industrial categories. For example: SIC 3341 Secondary Smelting and Refining of Non Ferrous Metals, SIC 5015 Motor Vehicle Parts, Used, SIC 5093 Scrap & Waste Materials, SIC 3471 Electroplating, Plating, Polishing, Anodizing & Coloring, SIC 3331 Primary Smelting and Refining of Copper, SIC 3351 Rolling, Drawing, and Extruding of Copper and SIC 3674 Semiconductor manufacturing. Report the number of these facilities inspected during the FY.

If available, report the number of roof runoff BMPs distributed and the number of industries identified where roof runoff may be of concern for copper. This information can be reported from the agency’s industrial/commercial stormwater inspection electronic data management system or from the attached supplemental inspection forms.

Report the copper POC training your stormwater inspectors received, the date of the training, and how many inspectors received the training.
Template
Pollutant of Concern (POC) Supplemental Inspection Form – Copper

Facility ID:
Facility Name:
Facility Address:
Inspector:
Inspection Date:

Type of Industrial Facility  

<table>
<thead>
<tr>
<th>SIC Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SIC 3341</td>
<td>Secondary Smelting and Refining of Non Ferrous Metals</td>
</tr>
<tr>
<td>SIC 5015</td>
<td>Motor Vehicle Parts, Used</td>
</tr>
<tr>
<td>SIC 5093</td>
<td>Scrap &amp; Waste Materials</td>
</tr>
<tr>
<td>SIC 3471</td>
<td>Electroplating, Plating, Polishing, Anodizing &amp; Coloring</td>
</tr>
<tr>
<td>SIC 3331</td>
<td>Primary Smelting and Refining of Copper</td>
</tr>
<tr>
<td>SIC 3351</td>
<td>Rolling, Drawing, and Extruding of Copper</td>
</tr>
<tr>
<td>SIC 3674</td>
<td>Semiconductor manufacturing</td>
</tr>
<tr>
<td>Other</td>
<td></td>
</tr>
</tbody>
</table>

Is copper a POC at this facility?  ❑ YES  ❑ NO
Are there ventilation systems that could deposit copper on the roof?  ❑ YES  ❑ NO
Are roof runoff drains plumbed to the storm drain system?  ❑ YES  ❑ NO
Did you distribute roof runoff BMPs?  ❑ YES  ❑ NO (not applicable/ already aware of BMPs)

Notes:

* Complete your agency’s standard stormwater inspection form and document effectiveness of stormwater pollution prevention BMPs (e.g. good housekeeping, outdoor storage, etc.).
### C.12.a.i.iii ► Municipal Inspectors Training

**Description:**

*Recommended annual reporting approach:*

Report the PCB POC training your stormwater inspectors received, the date of the training, and how many inspectors received the training. Describe any additional materials (added questions to standard stormwater inspection form, supplemental inspection form, checklists, guidance materials, BMPs, etc.) developed for inspectors.

### C.12.a.ii.iii ► Ongoing Training

**Description:**

*Recommended annual reporting approach:*

Report the PCB POC training your stormwater inspectors received, the date of the training, and how many inspectors received the training. Report the number of industries identified in the EPA Transformer Registration Database and number inspected this FY. Report the number of other facilities inspected where PCB containing equipment was identified and the number of each category of PCB containing equipment. Report the number of referrals to other regulatory agencies. This information can be reported from the agency’s industrial/commercial stormwater inspection electronic data management system or from the attached supplemental inspection forms.
Pollutant of Concern (POC) Supplemental Inspection Form – PCBs

Facility ID:
Facility Name:
Facility Address:
Inspector:
Inspection Date:

**Type of Equipment that contains PCBs**

| ☐ Transformers                                      |
| ☐ Capacitors                                       |
| ☐ Other electrical equipment including voltage regulators, switches, reclosers, bushings, and electromagnets |
| ☐ Oil used in motors and hydraulic systems          |
| ☐ Old electrical devices or appliances containing PCB capacitors |
| ☐ Fluorescent light ballasts                        |

**Miscellaneous products that may be found at older industries**

| ☐ Cable insulation                                  |
| ☐ Thermal insulation material including fiberglass, felt, foam, and cork |
| ☐ Adhesives and tapes                                |
| ☐ Oil-based paint                                    |
| ☐ Caulking                                          |
| ☐ Plastics                                          |
| ☐ Carbonless copy paper                             |
| ☐ Floor finish                                      |

Is facility in the EPA Transformer Registration Database? ☐ YES ☐ NO

Referred to another agency? ☐ NO ☐ YES: ☐ County Health Department
☐ DTSC
☐ California Department of Public Health
☐ Water Board

Provided information on proper labeling, storage, disposal and reporting of PCB containing materials ☐ NO/ALREADY AWARE ☐ YES

Notes:

* Complete your agency’s standard stormwater inspection form and document effectiveness of stormwater pollution prevention BMPs (e.g. good housekeeping, outdoor storage, etc.).
ATTACHMENT D
Inspector Training Power Point Presentation
Inspecting Industrial/Commercial Facilities
For
Pollutants Of Concern
Presentation Overview

- Regulatory Requirements
- Pollutants of Concern
  - Copper
  - Mercury
  - PCBs
- Inspection Forms
Regulatory Requirements

- Stormwater Municipal Regional Permit
  - Provision C.11 Mercury Controls
  - Provision C.12 Polychlorinated Biphenyls (PCBs) Controls
  - Provision C.13 Copper Controls

- BASMAAA Regional Training Materials
  - Guidance Manual for SW Inspectors
Pollutant of Concern
COPPER
Copper

- POC since the late 1980s.
- SF Bay listed as impaired by copper in 1989
- Government agencies and businesses made significant investment in copper source identification and copper reduction measures
- As of July 2003, all San Francisco Bay segments listed for copper have been removed from the State’s 303(d) list of impaired water bodies and placed on the monitoring list
- Site Specific Objectives (SSOs) adopted Jan 2009
Sources of Copper in Stormwater

- Vehicle brake pads
- Copper air emissions
- Architectural copper
- Industrial copper use
- Improper discharge of pool and spa water
- Potable water discharged to storm drains
- Soil erosion
- Copper containing pesticides
Provision C.13 Copper Control

- Identify commercial/industrial businesses likely to use copper or have sources of copper and include them in the inspection programs
- Inspectors need to ensure that proper BMPs are in place to minimize discharge of copper to storm drains
- Special emphasis on roof runoff that might accumulate copper deposits from on-site ventilation systems at industrial businesses
Industrial/Commercial Sources

- Electroplating
- Semiconductor manufacturing
- Metal finishers
- Auto dismantlers
- Car Washes
- Automotive Services
Copper in Roof Runoff

- Metal finishing, electroplating and semiconductor manufacturing industries
- Processes - copper chloride etchers, ammonia etchers, and acid plating bath exhaust vents
Inspection for Copper Deposition

- Look for chemical deposition around vents, pipes, and other roof surfaces to determine if there is a potential source of copper.
- If discolorations or deposits are seen, implement BMPs to minimize the contamination of roof runoff.
Best Management Practices

- Install vent covers and drip pans
- Prevent leaks in pipe fittings and containment vessels with routine maintenance
- Properly dispose of condensate from ventilation
- Promote condensation of ammonia etchant vapor
- Install scrubber system to treat ammonia etchant vapors
Pollutant of Concern

MERCURY
San Francisco Bay is considered to be “impaired” by mercury because some types of fish caught in the Bay contain mercury at concentrations that may threaten the health of humans consuming them.

TMDL adopted in SF Bay Basin Plan Feb 2008
Provision C.11

Permittees shall promote, facilitate, and/or participate in collection and recycling of mercury containing devices and equipment at the consumer level.
Industrial/Commercial Sources

- Facilities that use mercury in processes and equipment
  - metal finishing/electroplating facilities
- Facilities that have mercury containing products that need to be disposed properly
  - auto dismantlers/recyclers
  - E-waste collection centers
Mercury Containing Products

Fluorescent Bulbs
- Tubular and Circuline lamps
- Compact Fluorescent bulbs
- Tanning Lamps
- Germicidal Lamps

High Intensity Discharge (HID) Lights
- Metal Halide lamp
- High Pressure Sodium Lamps
- Mercury Vapor Lamps

Source: Northeast Waste Management Official’s Association (www.newmoa.org)
Mercury Containing Products

Other Types of Lighting

Mercury Short Arc Metal Halide Lamp

Mercury Xenon Short-arc Lamps

Mercury Capillary Lamps

Neon Lights

Source: Northeast Waste Management Official’s Association (www.newmoa.org)
Mercury Containing Products

Relays and Switches

- Root Switch from Sump Pump
- Tilt Switch from Washing Machine
- Mercury Displacement Relay
- Mercury Wetted Relay
- Flame Sensor from Gas Range
- Mercury Contact Relay

Source: Northeast Waste Management Official’s Association (www.newmoa.org)
Mercury Containing Products

Batteries – Standard Mercury Batteries, Alkaline Batteries

- Zinc Air Miniature Batteries
- Silver Oxide Button Cell Batteries
- Alkaline Manganese Oxide Button-Cell

Thermostats

- Mercury Thermostat
- Mercury Switch inside Thermostat
- Mercury Thermostat

Source: Northeast Waste Management Official’s Association (www.newmoa.org)
Best Management Practices

- Proper Disposal
- Spill Management
Proper Disposal

- Regulated by recycling and disposal requirements of the universal hazardous waste rules in the State of California.
- Small business may qualify as a Conditionally Exempt Small Quantity Universal Waste Generator (CESQUWG).
- CESQUWGs can recycle their lamps at their local government sponsored Hazardous Waste Recycling and Disposal Program’s sites or they can contract with a hazardous waste hauler to properly dispose of their hazardous waste.
Spill Management

- Never touch mercury with bare hands
- Never use vacuum cleaners or brooms to clean up mercury spills
- Use cardboard pieces, a squeegee, or an eyedropper to gather and draw up the mercury
- Place the mercury and the items used to clean up the spill in a bag and dispose off as hazardous waste.
Pollutant of Concern

PCBs
PCBs

- Synthetic chemicals
- Manufacture of PCBs was stopped in the U.S. in 1977 because of evidence they build up in the environment and can cause harmful health effects
- Regulated under the Toxic Substances Control Act (TSCA)
TSCA Regulations

Designed to ban the manufacture of PCBs and ensure the proper disposal of PCBs and PCB equipment, while minimizing the risk posed by the storage, use, and handling of the substance.
TSCA Regulations

- Include numerous exceptions and authorized activities

- Allowed uses of PCBs include servicing of PCBs in various PCB Equipment, such as transformers, capacitors, natural gas pipelines, and hydraulic systems
TSCA Regulations

- Owners of PCB Transformers must register transformers with EPA
- Requirements for marking, storage, record keeping and disposal of PCB containing equipment
Provision C.12.a

- Develop training materials
- Train municipal building inspectors to identify PCBs or PCB-containing equipment
- Integrate PCB inspections into existing inspections
- Reporting requirements
Identification of PCB-Containing Equipment

- Equipment will be marked
Identification of PCBs-Containing Equipment

- Look at Records
- Recordkeeping Requirements include
  - PCB weights
  - identification and numbers of items
  - storage, transfer, and disposal dates
  - identification of shippers and receivers
- Manufacturer’s label/PCB Fluid trade names
Transformers

PCB Transformer

Source: EPA
Capacitors

PCB Capacitor

Source: EPA
Hydraulic Systems

Source: EPA
Fluorescent Light Ballasts

Source: National Lamps and Components
Other Equipment Containing PCBs

- Heat Transfer Systems
- Electric Motors
- Electromagnets
Other Equipment

- These will be unmarked and possibly found in older buildings:
  - Investment casting wax
  - Carbonless copy paper
  - Resins
  - General sealants and coatings, including windshield sealant and silo sealant
  - Lubricants, including bridge bearings and additives to transmission fluids
  - Paint, including marine paint
  - Electrical cable insulation (If electrical cable contains liquids or damp insulation, PCBs should be suspected.)
  - Gaskets Roofing materials
Best Management Practices

- Employee Awareness
- Spill Containment Provisions in Work Area
- Proper Storage
- Proper Disposal
- No Leaks
INSPECTION FORMS
MRP C.12.a.ii requires inspectors to “document incidents in inspection reports and refer to appropriate regulatory agencies”

Examples of incidents

- PCB-containing equipment or storage container not properly labeled
- Spills

Referrals: phone call, email, fax inspection record
Regulatory Agency Referrals cont.

- Regulatory Agencies
  - Regional Water Board
  - DTSC
  - County Environmental Health Department (CUPA)
  - EPA Region 9
WRAP UP

- POC inspections to be integrated into existing inspection programs.
  - Use Guidance Manual for quick reference
  - Use Outreach Material for educating business operators
  - Complete Inspection Forms
Questions?

- Name and Contact Information of Trainer
ATTACHMENT E
Example BMP Materials
PREVENTING STORM DRAIN POLLUTION

Guidelines for Commercial and Light Industrial Facilities
The Santa Clara Valley Urban Runoff Pollution Prevention Program has prepared this housekeeping guidance manual for commercial and light industrial facilities as part of a program to reduce the amount of pollutants flowing through the storm drain system and local creeks to the South San Francisco Bay.

By following proper housekeeping practices, your business can help reduce pollution flowing to the Bay, preserve the South Bay ecosystem for animal and plant life, and protect our quality of life for future generations.
YOUR BUSINESS AND THE BAY: What’s the Connection?

Whether your business is two blocks or twenty miles from the water, it has two connections to the San Francisco Bay. Indoor drains, such as sinks, toilets and most floor drains, convey wastewater through the sanitary sewer system to a treatment plant where the water is treated before it is discharged into the Bay.

Outside your business, rainwater, wash water from buildings, road surfaces, vehicles, and equipment pick up oil, grease, cleaning compounds, pesticides, paint, garbage and other pollutants. Storm drains carry these pollutants through the storm drain system directly into local creeks and the Bay — they are not filtered or treated in any way.

SO WHAT’S THE BIG DEAL?

Rain and wash water in the storm drain can pick up all sorts of pollutants — soap, pesticides, cleaning compounds, coolants, degreasers, automotive fluids, paint, oil, trash and other materials. Even products labeled non-toxic or biodegradable can be harmful to sensitive marine ecosystems. Polluted runoff is toxic to fish and wildlife. It can harm the environment and threaten the health of our children.

The soap, coolant or oil running into the storm drain from your individual business may also be a big deal, but when commercial and light industrial facilities across the Santa Clara Valley fail to clean up their work sites, a lot of pollutants end up in the Bay. In other words, seemingly small problems at your business add up to big problems in the Bay.

IT’S ALSO AGAINST THE LAW!

Allowing discharge of wastes into storm drains is also against the law. If your business allows anything other than uncontaminated rain into the storm drain, you could be cited and held liable under federal, state and local regulations. The procedures outlined in this guidance manual offer some simple suggestions to help you ensure that your business does the right thing.

DOING THE RIGHT THING

By following these guidelines and making sure that your employees and contractors do too, you can help prevent storm drain pollution and keep your business in compliance. You also help protect the Bay ecosystem — and the plant and animal life that it supports — for future generations. Remember, clean water isn’t just good business — it’s everybody’s business.
CLEANING

Wash water from cleaning often contains solvents, detergents, and metals. Wash water should never be discharged to a street, gutter, or storm drain. Contact your local wastewater treatment plant for discharge guidance.

EQUIPMENT CLEANING

If possible, clean equipment inside and dispose of wash water to a sink or floor drain that connects to the sanitary sewer. Contact your local wastewater treatment plant for guidance.

If you must clean equipment outside, work in a bermed area where wash water can be collected and then pumped to an inside sanitary drain. Contact your local wastewater treatment plant for discharge guidance.

VEHICLE CLEANING

If possible, wash vehicles at a commercial car wash where water is treated and recycled.

If you routinely clean vehicles on-site, provide a bermed vehicle cleaning area with a wastewater collection and treatment system (such as an oil/water separator) which drains to the sanitary sewer system. Contact your local wastewater treatment plant for guidance on permit requirements for fleets.

Do not allow soapy wash water to run into the street, gutter or storm drain. Wash where water will flow to a lawn, gravel, or unpaved area. Or contain soapy wash water within a bermed vehicle cleaning area and pump wash water to the sanitary sewer.

Do not use solvents or acid-based degreasers in an area where wash water could flow to a street, gutter or storm drain. Instead, confine wash water within a bermed vehicle cleaning area where it can be pumped to an indoor sanitary drain (if allowed). Before using solvents or acid-based degreasers, contact your local wastewater treatment plant for wash water disposal options. Only degreasers that will not alter the pH of wastewater may be discharged to the sanitary sewer.

Reuse or recycle wash water to minimize discharges to the sanitary sewer.
BUILDING AND SURFACE CLEANING

When cleaning sidewalks, plazas, and building surfaces, wash water is permitted to go into a street or storm drain ONLY if ALL of the following conditions are met:

1. Oil or chemical spills have been cleaned up using spill absorbents or some other dry cleaning method before cleaning with water. When oil or chemicals are absorbed, sweep the material up and dispose of it as hazardous waste.

2. Surfaces are free of fresh oil stains and debris.

3. You have swept the area thoroughly prior to cleaning with water.

4. Wash water does not contain soap or other cleaning materials.

5. No paint chips are removed from the surface during cleaning (see Building Repair and Maintenance: Painting).

If you must use water for cleanup, use a damp mop instead of hosing down the area. Empty your bucket of wash water into an indoor floor drain or sink that drains to the sanitary sewer. Contact your local wastewater treatment plant for guidance.

When using a cleaning compound, direct wash water runoff to a landscaped or dirt area, or cover storm drains with filter fabric and vacuum or pump wash water into a sanitary sewer drain. Contact your local wastewater treatment plant for guidance — harsh cleaning compounds may require permitting and/or pretreatment.

Never hose or sweep interior floor debris to an outside area. Use a broom or vacuum for inside floor cleaning. Collect and dispose of all debris in the garbage or as hazardous waste as appropriate.

Use a street sweeper to clean parking areas and roadways. Do not use water.

When wet sand blasting, minimize the quantity of water used. Direct runoff to a landscaped or dirt area or filter runoff through a filter fabric to keep sand out of the storm drain. When finished, sweep up sand and debris.

If you hire a contractor for building and surface cleaning, make sure they are recognized by the Bay Area Storm Water Agencies Association (BASMAA).

Capture used cleaning water with a storm drain that has a shut off valve.
BUILDING REPAIR AND MAINTENANCE

Use and dispose of paint, paint thinner, metal filings, cutting oil and concrete properly to prevent them from entering the storm drain where they will harm local creeks and the Bay. Also, make sure that your contractors follow these guidelines; you are responsible for your contractors’ actions!

PAINTING

When pressure washing to prepare surfaces for painting, test painted surfaces for the presence of lead. If lead is not present, place a protective cover of filter fabric over the drain to catch paint chips and dispose of the chips in the garbage. If lead is present, collect chips and wash water and dispose of both as hazardous waste. Better yet, use a dry cleaning method such as scraping and sweeping and dispose of paint chips as hazardous waste.

If using water-based paint, brush out excess paint then wash brushes and equipment in the sink. Never dispose of paint or rinse water in a landscaped area, street, gutter or storm drain. Instead, use or recycle leftover paint. Call the County Recycling Hotline at (800) 533-8414 for more information.

If using oil-based paint, brush out excess paint before cleaning with paint thinner. Filter and reuse thinner when possible. Dispose of paint sludge and thinner as hazardous waste. Small businesses may qualify to use the Santa Clara County Small Generator Program at (408) 299-7300 for a small fee. For information on proper disposal at larger facilities, contact the Santa Clara County Department of Environmental Health Hazardous Materials Compliance Division at (408) 299-6930.

PLUMBING AND PIPE FITTING

Prevent pipe thread cutting oil and metal shavings from entering storm drains by placing a tarp or protective cover underneath equipment to collect filings, dust, metal shavings, and cutting oil. If necessary, use berms or storm drain covers to protect storm drains. Shovel or vacuum collected material into a garbage bin. Pick up all waste when you are finished in one location or at the end of each work day and schedule disposal.
CONCRETE

Store concrete, grout, and mortar under cover and away from storm drains.

Wash out concrete equipment, tools and trucks in a designated area where rinse water will flow onto a landscaped area or dirt pit. Let the water seep into the soil, leaving the cement residue behind. When the residue dries and hardens, dispose of it in the garbage. If you generate a large quantity of concrete, contact your local garbage hauler for disposal guidance. Alternatively, take concrete to a concrete recycling facility. Call the County Recycling Hotline at 800-533-8414 for more information.

When washing exposed aggregate concrete, divert water to a dirt area where it will not run into a street, gutter or storm drain. If a suitable dirt area is not available, use sandbags to dam up the flow of wash water. Use a wet vac to collect the remaining sludge and then dispose of it in the garbage.

SAW-CUT SLURRY

Completely cover or barricade storm drain inlets when saw cutting. Use filter fabric, hay bales, or sand bags to keep slurry out of the storm drain system.

Shovel or vacuum saw-cut slurry into a garbage bin. Pick up all waste when you are finished in one location or at the end of each work day and schedule disposal.

If saw cut slurry enters a storm drain catch basin, shovel or vacuum slurry into a garbage bin immediately.

FACILITY EQUIPMENT

Following an inspection and maintenance schedule and disposing of equipment byproducts (blowdown water, condensate, residues, melt water, etc.) properly will help keep pollutants out of storm drains, local creeks and the Bay where they can harm animal and plant life.

AIR COMPRESSORS

Inspect and maintain air compressors routinely.

Air compressors produce small quantities of automatic blowdown water, which commonly contains lubricating oil or other potential pollutants. This may not be discharged to the storm drain. Discharge all blowdown water to the sanitary sewer after contacting your local wastewater treatment plant for guidance.

If the compressor has a frequent small bleed, use a drip pan to collect the water. Dispose of accumulated water into the sanitary sewer.

Repair all fuel and oil leaks immediately. Use a drip pan until repairs are made. Clean any spilled fuel or oil using a spill absorbent or some other dry cleaning method. When the spill is absorbed, sweep up the saturated absorbent and dispose of it as hazardous waste.

Small businesses may qualify to use the Santa Clara County Small Generator Program at 408-299-7300 for a small fee. For information on proper disposal at larger facilities, contact the Santa Clara County Department of Environmental Health Hazardous Materials Compliance Division at 408-299-6930.

HVAC, CHILLERS, BOILERS, & REFRIGERATOR UNITS

Existing buildings with air conditioners can discharge non-contaminated condensate (condensate which does not contain descaling or anti-algal agents) to the storm drain.

New buildings should be designed so that all discharges from air conditioner condensation lines drain to the sanitary sewer. Consult your local planning or building department for more information.

Direct HVAC contractors to dispose of flushing agent residues (descaling or anti-algal agents) in the sanitary sewer. The use of chemicals containing copper and tributyl tin is prohibited.

Melt water from de-icing refrigeration units, cryogenic tanks, etc., may be disposed of in a storm drain as long as it does not contain any type of pollutant or come into contact with a pollutant (from drain and equipment storage nearby, for example).

All treated boiler discharge and blowdowns, including condensation, must be discharged to the sanitary sewer or reused or recycled in a closed loop system approved by your permitting agency.

COOLING TOWERS

Use of biocidal cooling tower additives (those containing copper, tributyl tin or chromium) may be prohibited. Contact your local wastewater treatment plant for more information.

Drain all cooling tower discharges to the sanitary sewer. Do not drain discharges to the parking lot, street, gutter or storm drain.

Cooling tower chemicals should not be stored adjacent to storm drains. For questions regarding chemical storage, contact your local fire department or the Santa Clara County Department of Environmental Health Hazardous Materials Compliance Division at 408-299-6930.
MATERIAL STORAGE

Contact your local fire department or the Santa Clara County Department of Environmental Health, Hazardous Materials Compliance Division at (408) 299-5930 for information on hazardous materials and waste storage.

As a temporary storage option, use a tarp or plastic sheet to cover materials exposed to rainwater. Consider installing a roof over permanent outdoor storage areas, or store materials inside a building. Contact local building and fire officials before beginning construction or relocating chemicals.

Replace or repair leaky equipment and containers. Place drip pans or absorbent materials under leaky equipment and containers until they can be repaired.

LOADING DOCKS

Pick up litter around loading docks regularly.

Keep absorbent materials nearby in order to clean up or contain spills promptly.

If you routinely handle liquids, your permitting agency may require that you install an emergency shut-off valve or storm drain plug that can be opened and closed in the nearest storm drain. Look in the Yellow Pages under Environmental, Conservation, and Ecological Products for a list of suppliers.

Protect materials from rainwater in an outdoor storage facility or inside a building.

Storm drains with shut-off valves can catch hazardous spills before they reach the storm drain system.
LANDSCAPING

Never apply chemicals or rinse water from equipment that has contained fertilizers, pesticides or herbicides to vegetation within a 24-hour period of forecasted rain especially when handling liquids and powders.

Use the least hazardous product for the job. For information on less hazardous products call the University of California Cooperative Extension Office at (408) 299-2638.

Use the recommended amount of chemical for the job. If using concentrate, mix only the amount you need and spray out all of the product. Rinse equipment over a landscaped area. Never pour rinse water down a storm drain.

Dispose of excess lawn and garden chemicals as hazardous waste. Small businesses may qualify to use the Santa Clara County Small Generator Program at (408) 299-7300 for a small fee. For information on proper disposal for larger businesses, contact the Santa Clara County Department of Environmental Health Hazardous Materials Compliance Division at (408) 299-6930.

Keep leaves, grass clippings, and other yard waste out of the streets, gutters and storm drains.

Rinse tools and equipment over a landscaped area, away from storm drains.
SPILL PREVENTION AND CLEANUP

The majority of pollution that flows off a site can usually be avoided by taking precautions to prevent spills and cleaning spills up promptly if they do occur.

Use dry absorbents to clean up spills.

Exercise care and planning to avoid potential spills, especially when handling liquids and powders.

Maintain a regular inspection and repair schedule to prevent leaks from equipment and storage containers.

Provide employees and contractors with absorbent materials for spill containment and cleanup. Keep spill prevention and cleanup materials in a location which is easy to find and easily accessible.

Clean up spills immediately with a spill absorbent material. When the spill is absorbed, sweep up saturated absorbents and dispose as hazardous waste. Small businesses may qualify to use the Santa Clara County Small Generator Program at (408) 299-7300 for a small fee. For information on proper disposal at larger facilities, contact the Santa Clara County Department of Environmental Health Hazardous Materials Compliance Division at (408) 299-6930.

Keep a supply of storm drain covers or plugs on hand. Make sure employees know where they are stored and how to use them. Keep these materials in a high profile location. Look in the Yellow Pages under Environmental, Conservation, and Ecological Products for a list of suppliers of storm drain covers, valves, rubber mats to use as storm drain covers, storm drain filtering mats and outdoor cleaning berms.

If you routinely handle liquids, your permitting agency may require that you install an emergency shut-off valve or storm drain plug (shown at right) that can be opened and closed in the nearest storm drain. Look in the Yellow Pages under Environmental, Conservation, and Ecological Products for a list of suppliers.
STORM DRAIN MAINTENANCE

Show your commitment to a clean business and a healthy Bay by maintaining the storm drain inlets on your property.

Locate and label all storm drain inlets on your business site. To receive free "No Dumping! Flows to Bay" storm drain stencils call the Santa Clara Valley Urban Runoff Pollution Prevention Program at (800) 794-2482.

Sweep up debris from parking lots and other paved areas regularly.

Clean out all storm drain inlets on your property with a vacuum or shovel at least twice a year — just before the start of the rainy season and after the first major rain.

The installation of French drains or dry wells for the purpose of disposing of storm water runoff is prohibited. Runoff entering these small, grated drains flows through a column of rocks and dirt to the groundwater aquifer which is a source of drinking water in some areas. Never dump or discharge into a French drain or dry well. Call the Santa Clara Valley Water District, Well Services Division at (408) 265-2600 for more information.

Clean out storm drain inlets at least twice a year — before the rainy season and just after the first major rain.
SHARING INFORMATION

EDUCATING AND TRAINING EMPLOYEES

- Storm drain pollution prevention begins and ends with effective employee education and training.
- Train new employees on the procedures in this manual.
- Review the guidelines in this pamphlet regularly with all employees.

OVERSEEING CONTRACTORS

- You are responsible for your contractor's actions.
- Before beginning work, show contractors where to clean equipment and discharge wash water or process waters.
- Make sure contractors know where emergency spill equipment is stored and how to use it.
- Consider incorporating pollution prevention practices into contract specifications.

THE BOTTOM LINE...

- Assert your reputation as a clean business:
  Tell your customers!
- Let your customers know what you're doing to prevent water pollution and encourage them to adopt clean water practices too. Where appropriate, itemize charges for hazardous waste handling and disposal.
NUMBERS TO CALL

To report a hazardous materials spill that is causing an immediate threat to human health or the environment

Dial 911

STORM WATER POLLUTION CONTROL REQUIREMENTS FOR BUSINESS AND INDUSTRY
1-888-BAYWISE (229-9473) ......................................................... (888) 229-9473
Santa Clara Valley Urban Runoff Pollution Prevention Program .................... (800) 794-2482

WASTEWATER PERMITTING AND ALLOWABLE DISCHARGES TO THE SANITARY SEWER
San Jose/Santa Clara Water Pollution Control Plant .............................. (408) 945-3000
(also serves Campbell, parts of Cupertino, Los Gatos, Milpitas, Monte Sereno,
and Saratoga)
City of Sunnyvale Water Pollution Control Plant ............................... (408) 730-7270
(also serves parts of Cupertino)
Regional Water Quality Control Plant (RWQCP) ............................... (415) 329-2598
(serves East Palo Alto, Los Altos, Los Altos Hills, Mountain View,
Palo Alto, and Stanford University)

COMPLIANCE WITH HAZARDOUS WASTE REGULATIONS
Santa Clara County Department of Environmental Health
Hazardous Materials Compliance Division ............................................. (408) 299-6930

SMALL BUSINESS HAZARDOUS WASTE DISPOSAL
Santa Clara County Hazardous Waste Recycling and Disposal
Small Generator Program ............................................................... (408) 299-7300
City of Palo Alto - open to businesses in the RWQCP service area .......... (408) 496-6980
City of Sunnyvale - open to Sunnyvale businesses ........................... (408) 730-7262

WASTE MINIMIZATION
Santa Clara County Pollution Prevention Program .............................. (408) 441-1195

PESTICIDE, HERBICIDE AND FERTILIZER ALTERNATIVES
University of California Cooperative Extension Office ........................ (408) 299-2638
Fluorescent lamps save energy!!

Fluorescent lighting is an excellent business and environmental choice because it can reduce energy consumption by 50% and lighting costs by 30-38%. Fluorescent lamps last, on an average, ten times longer than conventional incandescent lamps.

Fluorescent lamps contain mercury, so recycle them.

Each fluorescent lamp contains a small quantity of mercury. However, with the large number of lamps in use, this adds up to a significant amount that can be released into the environment if lamps are not recycled properly. Mercury can be toxic to humans and animals if inhaled, absorbed through the skin, or consumed through foods we eat. Other lamps that contain mercury include mercury vapor lamps, metal halide lamps, high-pressure sodium lamps and neon lamps. All of these should be recycled.

Keep Your Business Safe from Mercury-
Recycle used fluorescent tubes and compact fluorescent light bulbs

Does my business need to recycle fluorescent lamps?

Fluorescent lamps are classified as a universal hazardous waste and all businesses should recycle them. If you are a small business generating less than 220 lbs. of hazardous waste (including fluorescent lamps and other mercury-containing wastes) and less than 2.2 lbs. of acutely hazardous waste within any month of a calendar year, then your business may qualify as a Conditionally Exempt Small Quantity Universal Waste Generator (CESQUWG). (As an example, one box of 36 fluorescent lamps (four-foot long tubes) weighs about 24 lbs.) CESQUWGs are not subject to the same rules for training, accumulation, and packaging of their hazardous waste that the larger hazardous waste generators are. However, they do need to follow the recycling and disposal requirements of the universal hazardous waste rules in the State of California. CESQUWGs can recycle their lamps at their local government sponsored Hazardous Waste Recycling and Disposal Programs. Or, they can choose to collect and ship the lamps to a lamp recycling business. Click here for a list of California recyclers.

What Should I Do with Used Fluorescent Lamps?

Before you start to recycle your fluorescent lamps, make sure you and your staff is aware of the regulations and best management practices for handling and storing the wastes. If you are unsure about what is required of you, contact the Santa Clara County Hazardous Waste Recycling and Disposal Program at (408) 299-7300 for information. Additional resources may be found at the websites listed at the end of this article.

Storage - Store used fluorescent lamps for recycling in sturdy cardboard boxes (e.g. the ones they were shipped in). If those boxes are not available, some can be purchased from fluorescent lamp recyclers. Store boxes or containers in a secure, dry place.

Labeling - Place a label on the container with the date you started collecting lamps in it and mark it with the words “Used Lamps”, “Waste Lamps” or “Universal Waste-lamps”.
Breakages - If lamps are accidentally broken, clean them up promptly. Wear protective plastic or latex gloves to avoid touching the glass with your bare hands. Use pieces of cardboard to push the glass into a pile and carefully pick up the shards, placing them inside a heavy plastic bag that is placed inside of box or in a rigid container that can be sealed. Place a label on the container indicating that broken lamps are inside. Do not mix broken lamp debris in with the unbroken spent lamps you are recycling; otherwise the recycler for handling the wastes may charge you extra.

Recycling - Used lamps should not be accumulated for more than one year from the date you start collecting them until the time you recycle them.

Where to recycle used fluorescent lamps:

**Santa Clara County businesses (except Palo Alto):** The Santa Clara County Hazardous Waste Recycling and Disposal Program can take fluorescent lamps and other types of hazardous waste from CESQUWGs. Businesses using the service will be asked for a waste inventory and an EPA ID number and will be given a drop-off appointment. For information on how to obtain an EPA ID number visit www.DTSC.ca.gov and look under Frequently Requested Information. A temporary California ID number can be obtained by calling 1-800-618-6942. Businesses are charged disposal fees based on waste type and quantity. Fees are collected at time of drop-off. For more information call (408) 299-7300 or visit www.hhw.org.

**Palo Alto businesses:** CESQUWGs located in Palo Alto and its partner cities of East Palo Alto, Mountain View, Stanford, Los Altos and Los Altos Hills can dispose of their fluorescent lamps and hazardous waste at the Palo Alto Regional Water Quality Control Plant. Events are held monthly and by appointment only. For more information about Palo Alto’s hazardous waste program call (650) 496-6980.

**Recycling Firms:** Arrangements can also be made with a lamp recycling business to accept the lamps and ship them to a recycling business on your own. Common transportation carriers (e.g., UPS and FedEx) can pick up the lamps and transport them to a recycler. Also, some recyclers can schedule pick-ups from your business as a part of one of their regular routes. Check with a recycler to find out what their particular options and requirements are.

How else can you help reduce mercury pollution?

Buy low-mercury fluorescent lamps - Major lighting manufacturers now produce lamps with up to 80% less mercury than standard fluorescent lamps, such as Philips “Alto”, GE “Ecolux” and Sylvania “Ecologic”. However, none of these lamps are
Tailgate Safety Topic – Mercury (Hg)

What is it? - silver colored liquid. (Approx. 1 teaspoon weighs 70 grams).

Why is it a problem? – Hg is a nerve toxin that is harmful to people and the environment.

Where does Hg come from? Approximately 2/3 comes from human-made sources:

- Fluorescent lamps - (100 lamps contain about 4 grams of Hg).
- Hg Switches - (1 contains about 3.5 grams of Hg).
- Thermostats - (1 contains about 3 grams of Hg).
- Thermostat probes
- Gauges
- Relays
- Hg Vapor Lamps
- Metal Halide Lamps
- High Pressure Sodium Lamps
- Neon lamps
- Manometers
- Thermometers
- Laboratory Solutions
- Dental Amalgam

AND

- Coal Burning Power Plants
- Incinerators (& Landfills)
- Volcanoes
- Forest Fires

Safety Concern: Handle & dispose of products containing Hg so none of the mercury is released to the air, water or the land.

What to Do with:

Lamps:

- Fluorescent
- Hg Vapor
- Metal Halide
- High Pressure Sodium
- Neon

1. Do NOT Break or Crush
2. If broken, store in sealed container (pick up spilled powder & add to sealed container; do not breath in any dust)
3. Contact County/State Environmental office, or Solid Waste office for nearest recycling facility.

Switches, Relays, Thermostats, Probes, Gauges & Manometers:

1. Remove part (Do NOT Break)
2. Store in covered air tight container
3. Label Container - Hg Waste for Recycling
4. Contact County/State Environmental office, or Solid Waste office for nearest recycling facility.

Track:

- Date of Shipment
- Amount of waste
- Location shipped from & Destination of shipment

Revised 2/10/03
Call HHW to schedule a drop off appointment - **408-299-7300**

For a list of mercury-containing products log on to [www.hhw.org](http://www.hhw.org).

**Call HHW to schedule a drop off appointment - **408-299-7300**

For a list of mercury-containing products log on to [www.hhw.org](http://www.hhw.org).

The Department of Environmental Health Mercury Education Project is funded by a grant from the California Integrated Waste Management Board.

- Call for help & information - Household Hazardous Waste Program **408-299-7300**
Mercury can be found in household, commercial and industrial products in liquid or vapor form. Elemental mercury is a shiny liquid, silver-white in color and is found in thermometers, thermostats and irons. Mercury vapor, a colorless, odorless gas, is found in fluorescent, high intensity discharge, neon and some automotive headlamps. Elemental mercury when spilled (at room temperature) can break up into small droplets and evaporate to form mercury vapor.

Exposure to Elemental mercury or mercury vapor is toxic, especially to children and infants. Mercury exposure can adversely impact nervous system development. Contact your physician or a poison control center immediately if you or your children have been exposed to mercury liquid or vapor.

For help and information - Call HHW at 408-299-7300

CAUTIONS
- NEVER touch mercury with bare hands
- NEVER use a vacuum cleaner on a mercury spill it will cause vaporization
- NEVER use a broom to cleanup a mercury spill it will cause the mercury to break up into smaller beads which will be difficult to collect
- NEVER put mercury down the drain, in the trash or incinerator
- NEVER use household cleaners to cleanup mercury spills

MANAGING SPILL AREA
- Keep all people and pets away from the spill area
- Shut doors and all air vents to spill area to avoid spreading contamination
- Cool down spill area by opening windows or doors facing the outdoors for two days if possible - use fans to pull air outside to decrease vaporization
- Remove any contaminated clothing and shoes before exiting spill area (Place contaminated clothing in plastic bags with other "mercury waste")
- Contain mercury spill by diking the surrounding area with rags or other disposable items – a flashlight will help locate Mercury since it reflects light

ASSEMBLE NECESSARY CLEANUP EQUIPMENT
- Neoprene gloves
- Permanent marker
- Pieces of cardboard
- Flashlight
- Rags
- Plastic soda bottles or wide-mouth container
- Large tray or box
- Duct tape
- Cutting utensils
- Plastic bags
- Eyedropper or small baster
- Put gloves on before entering spill area. Following cleanup, remove gloves carefully turning inside out to avoid touching mercury and wash hands.

SPILLS ON HARD SURFACES
- Using cardboard pieces, push beads of mercury together
- Using eyedropper suction up mercury or use cardboard to lift up beads
- Carefully place mercury in plastic soda bottle/container, seal with duct tape
- Place container and cleanup supplies (contaminated tape, rags, eyedropper, cardboard and gloves, etc.) in a plastic bag, seal and label "mercury waste"
- Place bag in a second plastic bag, seal and label "mercury waste"

SPILLS ON CARPET OR RUG
- Cut out a section of carpet/rug a bit larger than the mercury-containing area to ensure that all the mercury is captured
- Place cut-out section, gloves and cutting utensil in container
- Seal container with duct tape and label "mercury waste"
- Place container in a plastic bag, seal and label "mercury waste"

SPILLS IN A SINK OF WATER
- Remove as much water as possible without disturbing the mercury at the bottom (since mercury sinks to the bottom)
- Suction mercury from the bottom with eyedropper
- Empty the eyedropper into a plastic soda bottles or wide-mouth container
- Seal container with duct tape
- Place container and cleanup supplies (gloves, eyedropper, etc.) in a plastic bag, seal and label "mercury waste"
- Place bag in a second plastic bag, seal and label "mercury waste"
This brochure is one of a series of pamphlets describing storm drain protection measures for specific types of construction industry activities. Other pamphlets include:

**General Construction and Site Supervision**

**Landscaping, Gardening, and Pool Maintenance**

**Painting and Application of Solvents and Adhesives**

**Roadwork and Paving**

**Earth-Moving Activities**

**Heavy Equipment Operation**

**Dewatering Activities**

**New Stormwater Control Requirements**

For more information about the countywide storm drain protection program, and additional brochures, call:

San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP)
555 County Center, Fifth Floor
Redwood City, CA 94063
(650) 363-4305
www.flowstobay.org

For more information -

**Non-emergency calls:**

1. San Mateo County Environmental Health Division’s Household Hazardous Waste Hotline includes information for businesses who qualify under the Very Small Quantity Generator Program: (650) 363-4718

2. Local stormwater programs (see list below) can provide stormwater pollution prevention information and additional brochures:

   - Town of Atherton (650) 752-0541
   - City of Belmont (650) 595-7427
   - City of Brisbane (415) 508-2130
   - City of Burlingame (650) 558-7230
   - Town of Colma (650) 757-8888
   - City of Daly City (650) 991-8200
   - City of East Palo Alto (650) 853-3189
   - City of Foster City (650) 286-3270
   - City of Half Moon Bay (650) 726-8260
   - Town of Hillsborough (650) 375-7411
   - City of Menlo Park (650) 330-6740
   - City of Millbrae (650) 259-2339
   - City of Pacifica (650) 738-3767
   - Town of Portola Valley (650) 851-1700
   - City of Redwood City (650) 780-7464
   - City of San Bruno (650) 616-7160
   - City of San Carlos (650) 802-4361
   - City of San Mateo (650) 522-7340
   - City of South San Francisco (650) 877-8634
   - Town of Woodside (650) 851-6790
   - County of San Mateo (650) 363-4708
   - Also contact www.flowstobay.org

3. San Francisco Bay Regional Water Quality Control Board:
   510) 622-2300

**Emergency calls only:**

1. Dial 911
2. Governor’s Office of Emergency Services Warning Center (24 hours): 1-800-852-7550

San Mateo Countywide Stormwater Pollution Prevention Program (STOPPP)
www.flowstobay.org

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printed on recycled paper
Storm Drain Pollution from Mercury Thermostats and Fluorescent Lamps

Mercury is a silver-colored heavy metal that is liquid at room temperature. It is toxic to humans and animals if inhaled, absorbed through the skin, or ingested in very small amounts. Mercury from demolition sources that gets washed into the Bay contributes to unsafe levels of mercury found in fish. Disposing of mercury-containing thermostats and fluorescent lamps as regular trash also causes serious problems and is illegal. You can help prevent releases of mercury to the Bay and ocean and comply with state law by recycling all mercury-containing thermostats and fluorescent and high-intensity discharge (HID) lamps.

Mercury-Containing Thermostats
Each of these switches contains about 2 to 4 grams of mercury. It is common to find thermostats with one, two or four vials of mercury. Mercury-containing thermostats are banned from regular trash disposal in California because they contain mercury.

Fluorescent Lamps
Fluorescent lamps and high-intensity discharge (HID) lamps, including mercury vapor, high-pressure sodium, and metal halide lamps are banned from regular trash disposal in California because they contain mercury.

General Business Practices - Thermostats

Identification
Most thermostats have a removable front plate. This plate should be removed to determine whether or not the thermostat contains mercury.

Removal
- To remove a mercury-containing thermostat, it is necessary to remove the whole thermostat.
- A screwdriver and wire cutters should be used to remove the thermostat without damaging it.
- Average time for removal is 60 seconds.
- If vials of mercury are removed from the thermostat, instead of removing the whole unit (not recommended), these vials should be placed in plastic sealable bags prior to placing them in an airtight container.

Mercury-Containing Thermostats

Identification
Fluorescent lamps can be found in various overhead light fixtures and exit signs. They come in many shapes and sizes. ALL FLUORESCENT LAMPS CONTAIN MERCURY.

Storage and Disposal
- Fluorescent lamps are very delicate. Applying excess force to the lamp may result in injury.
- Lamps should be stored in appropriate containers to prevent breakage.
- Some mercury recyclers rent or provide cylindrical cardboard boxes for safe transportation of fluorescent lamps.
- A 15-inch diameter drum for eight-foot lamps holds between 80-90 fluorescent lamps, while a 21-inch diameter drum for four-foot lamps holds between 160-170 lamps.

Proper Disposal
Arrange recycling with a mercury recycler or call the Very Small Quantity Generator Program (VSQG) to see if you qualify. The California Code of Regulations, Title 22, requires that you recycle fluorescents and other mercury-containing lamps, switches, and thermometers.

Commercial Mercury Recycler Services
Fluorescent and other mercury-containing lamps and mercury-containing devices, such as thermostats, switches, and relays. Company names are provided for information purposes, and they are not endorsed by STOPPP.

In Case of a Mercury Spill
- Never vacuum, use a paintbrush, broom or household cleaning products to clean up the spill.
- Never pour or allow mercury to go down a drain.
- Use a mercury spill-kit if one is available.
- Dam the mercury (using rags or other disposable items) to prevent spreading.
- Gather the mercury beads with a piece of thin cardboard by pushing beads together into a plastic dustpan.
- Keep persons who are not involved in the cleanup away from the spill area to limit exposures and prevent the spread of contamination.
- Immediately ventilate the area.
- Store clean-up debris in a heavy plastic bag inside a box or in a rigid plastic container that can be sealed.
- Place a label on the container indicating broken lamps or vials are inside, so that the recycler can handle them appropriately. Do not mix glass debris with unbroken spent lamps or thermostats when they are recycled.
- Put contaminated clothing/shoes into a trash bag and wipe any visible mercury beads into a bag.
STORAGE
CESQGs may store up to a maximum of 27 gallons or 220 lbs. of hazardous waste (or up to 2.2 lbs. of extremely hazardous waste). After maximum quantity is reached, waste must be removed from the site within 90 days.

TRANSPORTATION
If you plan to transport more than 5 gallons or 50 lbs. of hazardous waste to the CESQG Program, we will send you a State variance allowing you to legally transport up to 27 gallons or 220 lbs. You will receive more information about transportation requirements when you register.

LABELING
All hazardous waste containers must be labeled according to state regulations.

FOR MORE INFORMATION ABOUT THE CESQG PROGRAM, CALL (408)299-7300.
Properly disposing of hazardous waste can be costly and inconvenient.

Businesses generating less than 27 gallons or 220 lbs. (100 kgs.) of hazardous waste per month, or less than 1 quart or 2.2 lbs. (1 kg.) of extremely hazardous waste each month are legally classified as conditionally exempt small quantity generators (CESQGs). California state law permits CESQGs to bring their hazardous waste to government-sponsored drop-off programs.

The County of Santa Clara CESQG Program complies with waste disposal regulations and reduces disposal costs by consolidating the small quantities of hazardous waste received from businesses like yours.

To participate in the CESQG Program, please fax a detailed inventory on your business letterhead to (408) 280-6479. In order to receive an accurate quote, the inventory of your hazardous waste should include:

- Type of waste and their hazardous properties if possible (flammable, corrosive, reactive, or toxic).
- Number of containers.
- Size of the container (we do not accept any containers larger than 5 gallons).
- Volume of waste (gallons, pounds, etc.).
- Your EPA ID number (Obtain an EPA ID number by calling 1-800-618-6942).

Our quotes are based on waste type and quantity.

Drop-off facilities are open every Wednesday in San Jose, one Friday a month in Sunnyvale and one Thursday a month in San Martin. Drop-off is by appointment only. Appointments must be made at least one week prior to the drop-off.

Disposal charges are collected at the time of drop-off, and may be paid by check or money order only (payable to SCC HHW).

Credit cards and cash are not accepted. Only waste listed on your detailed inventory will be accepted during your drop-off.

Legal documentation is provided as part of the service. Receipts should be kept for at least three years after disposal.

For additional information, please call the County of Santa Clara Hazardous Waste Recycling and Disposal Program at (408) 299-7300 or visit www.hhw.org.
Facilities covered under the State NPDES Industrial Activities Storm Water General Permit should include roof runoff in their assessment of potential pollutant sources.

The Concern
Roof runoff in industrial areas can be a significant source of pollutants to stormwater. Early studies of roof runoff have shown that galvanized metal roofs are sources of zinc at concentrations two to twenty times greater than other urban source areas, and often produce runoff that exceeds acute toxicity for aquatic life. Materials, paints, and coatings associated with roofing are also suspected of being significant sources of copper and lead.

Local Studies/Findings
Studies conducted by the cities of San José and Sunnyvale show that metal finishing and electroplating processes contributed greater amounts of copper and nickel to stormwater runoff than other industrial and commercial activities.

Deposition was visible at most facilities, ranging from a slight discoloration to a dark blue or deep green deposit. Leaks in exhaust pipes and containment vessels could be seen as localized deposition directly below the pipefitting. Air deposition of exhaust vapors could be seen as a plume radiating out from the exhaust pipe.

However, data from one of the pilot facilities showed that an absence of visual deposition does not imply an absence of pollutants.

To see an example of roof contamination go to: www.ci.san-jose.ca.us/esd/com-roof-runoff.htm

BMPs
There are a variety of Best Management Practices (BMPs) available to prevent rooftop pollution (see list at right).

An evaluation of various BMPs being implemented in the area in 2000 demonstrated the complexity and the effectiveness of some BMPs. For example, BMPs to control pollutant release from ammonia etcher exhaust vents vary.

The most basic type of control method is a vent cover and drip pan collection system. The vent cover provides a surface for condensation of exhaust vapors and protects from rain entering the system. Condensate in the drip pan is plumbed to the waste treatment system or emptied manually. In some cases, ammonia etchant vapor condenses readily in the vent pipe. In other cases, the vapor contacts the vent cover and condenses into the collection pan. Sometimes, however, vapors escape to the atmosphere and condense on the roof.

To promote condensation, one facility employed chiller coils at the junction of the ammonia etcher and exhaust vent. This technique also helps reduce chemical loss.

Another BMP is to treat ammonia etchant vapors with a scrubber system. The effectiveness of the scrubber seems to depend on the type of scrubber solution used. Using plain water in the scrubber system was ineffective in controlling emissions, leaving deposits of copper salts on the roof. A dilute sulfuric acid solution seems to be the most effective means of treating exhaust vapors from an ammonia etcher.

The information provided here is intended to provide examples for consideration. It is the responsibility of a discharger to determine the applicability of any treatment to his/her facility.
Actual Results from One Site

The table below shows that concentrations from a non-process rooftop at one printed circuit board manufacturer consistently produced the lowest values of the four monitoring areas. Parking lot runoff has higher contamination due to cars. For comparison purposes, non-process roof runoff can be a useful gauge for identifying contaminated runoff. The table below illustrates that the waste treatment area had higher pollutant concentrations than non-process and parking lot areas, and roof runoff from process buildings can be even higher.

<table>
<thead>
<tr>
<th>Time</th>
<th>Waste Treatment</th>
<th>Parking Lot</th>
<th>Process Roof</th>
<th>Non-Process Roof</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Sample</td>
<td>2.58</td>
<td>0.477</td>
<td>0.028 99.1 25.0</td>
<td>0.155 0.267</td>
</tr>
<tr>
<td>40 min. later</td>
<td>1.03</td>
<td>0.93</td>
<td>0.012 2.51 12.0</td>
<td>0.097 0.062</td>
</tr>
<tr>
<td>80 min. later</td>
<td>2.07</td>
<td>—</td>
<td>0.123 3.10 14.4</td>
<td>—</td>
</tr>
<tr>
<td>100 min. later</td>
<td>—</td>
<td>0.121</td>
<td>— — —</td>
<td>0.053 0.064</td>
</tr>
<tr>
<td>120 min. later</td>
<td>—</td>
<td>—</td>
<td>0.118 3.15 3.16</td>
<td>—</td>
</tr>
</tbody>
</table>

Facilities with electroplating and metal finishing processes are urged to evaluate rooftops for pollutant sources, such as exhaust vents, and update their SWPPP accordingly. Without such an evaluation, you may now be required to file a Notice of Intent (NOI) or your existing SWPPP may be incomplete.
Are You In Compliance With Your Industrial Activities Storm Water Permit?

The State and Regional Water Quality Control Boards are continuing their efforts to identify dischargers who have not obtained coverage under the Industrial Activities Storm Water General Permit by filing a Notice of Intent, a No Exposure Certification form, or a Notice of Non-applicability.

If your facility has not submitted annual reports or modified your SWPPP to evaluate rooftop pollutant sources, then the local Regional Board can fine you for each year of non-compliance.

To determine if you need to file, contact the Regional Water Quality Control Board at (510) 622-2494 to request guidance. You may also contact the City of Sunnyvale Pretreatment Program at (408) 730-7270 for assistance.

For additional information, contact the City of Sunnyvale Water Pollution Control Plant.

1444 Borregas Ave.
P.O. Box 3707
Sunnyvale, CA 94088-3707

Tel: (408) 730-7260
FAX: (408) 730-747-1139

http://wpcp.sunnyvale.ca.gov

Metal Finishing and Plating Industries: Is Your Roof Runoff Polluted?

What You Can Do to Reduce Impacts to Storm Water Runoff

City of Sunnyvale
408) 730-7260
Local Studies & Findings:
Studies conducted by the cities of San Jose and Sunnyvale show that metal finishing and electroplating contributed to greater amounts of copper and nickel to storm water runoff than other industrial and commercial activities.

Potential sources of copper and nickel in roof deposition were identified as copper chloride etchers, ammonia etchers, and acid plating bath exhaust vents. Depositions were visible at most sites, ranging from a slight discoloration to a dark blue or deep green deposit. Air deposition of exhaust vapors was seen as a plume radiating from the exhaust pipe. One facility showed that even though there was no visible deposition of pollutants, they were present in sample collected.

Best Management Practices (BMPs)
Look for chemical deposition around vents, pipes, and other roof surfaces. If discolorations or deposits are seen, steps should be taken to minimize the contamination of roof runoff.

The most effective types of structural BMPs to control pollutant releases from ammonia etcher exhaust vents will vary from site to site. Some examples to consider are listed below:

- Install vent covers and drip pans where there are none. Vent covers provide a surface for condensation of exhaust vapors and help prevent rain from entering the system. Prevent leaks in pipe fittings and containment vessels with routine maintenance
- Properly dispose of condensate from ventilation. Condensation in the drip pan should be plumbed to the waste treatment system or emptied into it manually.

The Concern
- Ventilation from etching equipment & acid plating baths can be a source of roof contamination.
- Sometimes roof runoff has higher copper and nickel concentrations than runoff from chemical and waste handling areas.
- Roofs with no visible contamination may be a significant pollutant source.
- Scrubbers may be less effective than you think.

If ammonia etchant vapor escapes into the atmosphere and condenses on the roof, consider promoting condensation within piping containment, such as using chiller coils at the junction of the ammonia etcher and the exhaust vent. This may also help reduce chemical loss.

Ammonia etchant vapors can be treated using a scrubber system. The effectiveness of the scrubber system depends on the type of scrubber solution used, and plain water appears to be ineffective. Check that your scrubber solution is appropriate for the chemistry of the fumes. A dilute sulfuric acid solution seems to be the most effective means of treating exhaust vapor from an ammonia etcher.

If you have electroplating or metal finishing processes at your business, it is recommended that you evaluate rooftops for pollutant sources such as exhaust vents and condensation leaks, then update your Storm Water Pollution Prevention Plan (SWPPP) accordingly. A SWPPP may be considered to be incomplete if a facility fails to file a required Notice of Intent that includes roof runoff in its evaluation.