April 25, 2014

Via Electronic Mail

Mr. Steve Armann
Manager, RCRA Corrective Action Office
Waste Management Division
U.S. Environmental Protection Agency, Region IX
75 Hawthorne Street
San Francisco, California 94105-3901

Re: Comprehensive PCB-Related Building Materials Inspection, Management, and Removal Plan for the Santa Monica-Malibu Unified School District

Dear Mr. Armann:

Enclosed please find the Draft Comprehensive PCB-Related Building Materials Inspection, Management, and Removal Plan (Draft Comprehensive Plan) that ENVIRON International Corporation (ENVIRON) has prepared for the Santa Monica – Malibu Unified School District (SMMUSD or the District). This Draft Comprehensive Plan is applicable to and will be implemented by the District for all schools.

In terms of Malibu Middle/High School (MHS) and in response to your letter dated January 27, 2014, ENVIRON has prepared the following specific responses to your requests in that letter.

1) "Removal of all caulk with known concentrations above 50 ppm PCBs in the library and in Blue Building Rooms 1, 5, and 8. Even though air concentrations are below our health based guidelines, the cleanup plan should include post caulk removal air sampling as well as wipe sampling around the areas where caulk was removed."

   Response: ENVIRON will coordinate with the District on the specific schedule for the planned demolition of the Great White Building (including the library) and renovation of the Blue Building. It is estimated that work could begin 9 to 12 months after receiving Coastal Commission approval of the current MHS demolition/renovation plan. Renovation of the Blue Building will include caulk removal in Rooms 1, 5, and 8. The approach outlined in Section 4 of the enclosed Draft Comprehensive Plan will be followed during the removal. Until the time of the planned demolition and renovations, Best Management Practices (BMPs) outlined in Section 3 will be implemented for these areas at MHS.

2) "Mitigation or removal of any caulk that is deteriorating in pre-1979 structures at Malibu High School/Middle School. After mitigation or removal of any caulk, the windowsills and adjacent areas should be thoroughly cleaned."

   Response: As soon as this Draft Comprehensive Plan is approved by the USEPA, ENVIRON will initiate the building inspection for the MHS campus as outlined in Section 2 of the Draft Comprehensive Plan. This process will identify materials that potentially could contain or be impacted by PCBs including any deteriorating caulk. Upon completion of the inspection, an Inventory of Potentially PCB-Impacted Materials will be created and these materials will be managed in place following the BMPs as outlined in Section 3 until the next planned renovation in or demolition of the building. Deteriorating caulk will be repaired and/or

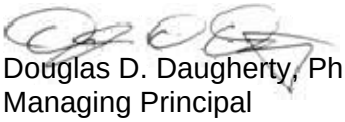
encapsulated as described in Section 3 of the Draft Comprehensive Plan. The windowsills and adjacent areas will be thoroughly cleaned and then managed in place as per Section 3 of the Draft Comprehensive Plan. These deteriorating caulking materials will be removed at a future time prior to a scheduled demolition or during a renovation following the procedures in Section 4 of the Draft Comprehensive Plan.

3) "Development of an air sampling plan for EPA approval that, at a minimum, ensures that all rooms in pre-1979 structures at the school will be sampled. It is acceptable for the District to conduct PCB Aroclor analysis in lieu of the PCB congener analysis."

   Response: As soon as this Draft Comprehensive Plan is approved, the District will start implementing the BMPs in those pre-1979 structures on the MHS campus identified during the inspection process described in Section 2 of the Draft Comprehensive Plan. ENVIRON will generate an Inventory of Potentially PCB-Impacted Materials upon completion of the building inspection. These materials will then be managed in place using BMPs as described in Section 3 of the Draft Comprehensive Plan until a planned demolition or renovation. In response to EPA's request above for the MHS, air sampling will be conducted in representative rooms containing potentially PCB-impacted materials, which are regularly occupied, and after the first annual BMP cleaning or caulk repair. It should be noted that The Phylmar Group conducted air sampling in 20 rooms in the Blue Building, the Mako Building, and the Thresher Building as well as the library, and they were collected either before or after cleaning; therefore, it is not necessary to conduct air sampling in those rooms since all the results were all below USEPA's health-based threshold.

The District will implement this Draft Comprehensive Plan at MHS first, and based on its experience, this Plan may be modified/improved after its implementation at MHS. We hope that the enclosed Draft Comprehensive Plan, our responses above, and our overall strategy meet your approval.

Very truly yours,



Douglas D. Daugherty, PhD, PE, CIH
Managing Principal

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cc: Sandra Lyon and Janece Maez, SMMUSD
Tom Huetteman, USEPA Region IX

DRAFT



Comprehensive PCB-Related Building Materials Inspection, Management, and Removal Plan

for the Santa Monica-Malibu Unified School District

Prepared for:
Santa Monica-Malibu Unified School District
Santa Monica, California

Prepared by:
ENVIRON International Corporation
Irvine, California

Date:
April 2014

Project Number:
0433980B

ENVIRON

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Acronyms and Abbreviations

bgs	below ground surface
BMP	Best Management Practice
Cal/EPA	California Environmental Protection Agency
Cal/OSHA	California Division of Occupational Safety and Health
CFR	Code of Federal Regulation
cm^2	square centimeter(s)
DOT	Department of Transportation
DTSC	California Department of Toxic Substances Control
ENVIRON	ENVIRON International Corporation
FLB	fluorescent light ballasts
HASP	health and safety plan
HEPA	high-efficiency particulate air
mg/m^3	milligram(s) per cubic meter
MHS	Malibu Middle/High School
MSDS	material safety data sheet
MERV	minimum efficiency reporting value
NAAQS	National Ambient Air Quality Standard
OSHA	Occupational Safety and Health Administration
PCB	polychlorinated biphenyl
PEA	preliminary environmental assessment
PEL	permissible exposure limits
PM-10	particulate matter less than 10 microns in diameter
PM-2.5	particulate matter less than 2.5 microns in diameter
PPE	personal protective equipment
ppm	parts per million
PUF	polyurethane foam
QA/QC	quality assurance/quality control
SMMUSD	Santa Monica-Malibu Unified School District
SOP	Standard Operating Procedure
TWA	time-weighted average

TSCA	Toxic Substances Control Act
USEPA	United States Environmental Protection Agency

1 Introduction

Historically, polychlorinated biphenyls (PCBs) were used as a plasticizing agent for caulking and glazing materials, as additives to paints and floor finishes, as sealants for heating systems and plumbing, and as insulators in ballasts or other electrical equipment. The manufacture of and most uses of PCBs were banned in the United States in 1976 and PCB compounds were phased out in the 1978 to 1979 timeframe. Based on the construction history and age of the school buildings throughout the Santa Monica-Malibu Unified School District (SMMUSD or District), PCB materials potentially exist in District school buildings. The surveys and sampling conducted in some buildings at the Malibu High School (MHS) during the last quarter of 2013 discovered that caulking materials around the windows, interior wall paints, and dust on the windowsills contained PCBs. However, air sampling conducted in the areas where these PCBs were identified indicated that results were well below the health-based threshold for PCBs established by the United State Environmental Protection Agency (USEPA).

In February 2014, the District retained ENVIRON International Corporation (ENVIRON) as the District's consultant to perform evaluations and assessment of environmental issues related to PCBs, as requested, and to assist the District in achieving the District's goal of assuring employees and the community that the schools within the District are healthy learning and working environments. To proactively, effectively, and efficiently address the potential presence of PCB materials in the individual schools, ENVIRON has prepared this Comprehensive PCB-Related Building Materials Inspection, Management, and Removal Plan (Comprehensive Plan), which will be implemented by the District. This Comprehensive Plan describes how suspect building materials will be identified and inventoried, what best management practices (BMPs) will be implemented to minimize exposure of students, teachers, and employees to these suspect materials, and when/how the suspect PCB-containing materials will be removed. The overall approach is to conduct comprehensive building inspections (Section 2) and implement BMPs to manage materials in place, if deemed safe and appropriate, (Section 3) until a scheduled demolition or renovation when PCB-containing materials will be removed (Section 4). This is the approach currently being taken for New York City Schools.[1]

This Comprehensive Plan has been prepared by ENVIRON for review and concurrence by the USEPA Region IX. This Plan also incorporates relevant inputs from the Survey Questionnaire, distributed by the Department of Toxic Substances Control (DTSC) and ENVIRON to the school staff and community, that have been received to date.[2]

The District will implement this Comprehensive Plan at MHS first and expects a learning curve during its implementation as well as the collection of additional data. The Plan and its implementation may be modified / improved based on its implementation experience at the MHS.

[1] Draft Best Management Practices (BMP) for PCB Caulk in New York City School Buildings, EPA Consent Agreement and Final Order Docket Number: TSCA-02-2010-9201 Consent.

[2] Survey questionnaires were distributed via email on April 4, 2014 with a response deadline of April 25, 2014. A copy of the survey questionnaire is included in Appendix A.

1.1 Plan Organization

This Comprehensive Plan is organized into the following sections:

- **Section 2**. PCB-Related Building Materials Inspection Plan establishes the protocol that ENVIRON (or other District staff or contractors) will follow to develop the PCB inventories for the individual schools. The Inspector will conduct thorough inspections for all buildings, which were constructed or renovated prior to 1981, to document construction materials that might contain PCBs and review related and available documents for previous surveys and remediation efforts, such as removal of ballasts.
- **Section 3**. PCB Best Management Practices Plan contains BMP elements recommended by the USEPA and details the procedures for cleaning, inspection, repair, validation, and waste disposal and assigns responsibilities for implementation of the BMP Plan.
- **Section 4**. PCB-Related Building Materials Removal Plan has been prepared in accordance with the Toxic Substances Control Act (TSCA) regulations in Title 40 Code of Federal Regulation (CFR) Part 761 (40 CFR 761). Prior to a planned renovation or demolition, PCB-containing building materials will be tested and removed. ENVIRON will oversee the removal and cleanup activities to be conducted by a qualified contractor. This Section presents the protocols of PCB removal, describes the appropriate health and safety measures, and provides the guidance on segregating waste and appropriate waste disposal.
- **Section 5** outlines quality assurance and quality control procedures.

2 PCB-Related Building Materials Inspection Plan

This PCB-Related Building Materials Inspection Plan ("Inspection Plan") provides information on procedures to be followed to conduct an inspection for materials suspected of containing PCBs at schools located within the SMMUSD. The Inspection Plan covers the objectives and responsibilities under this plan and is organized into three main inspection sections: pre-inspection activities, inspection procedures, and post-inspection activities.

2.1 Objectives of the Inspection

The primary objectives of the building inspection include:

- Evaluate the potential presence of PCB-containing materials in school buildings located throughout the SMMUSD;
- Prepare inventories to document the types, quantities, locations, and conditions of potential PCB-containing materials;
- Identify current or future activities which could potentially impact the conditions of the potential PCB-containing materials; and
- Identify appropriate next steps.

Each of these objectives is discussed in greater detail in the remainder of this plan.

2.2 Responsibilities

2.2.1 Superintendent or Designee

The Superintendent of the SMMUSD or designee is responsible for overall implementation and management of the Inspection Plan. These responsibilities include, but are not limited to, the following:

- Review the Inspection Plan initially;
- Periodically review the Inspection Plan and propose changes if necessary;
- Coordinate with federal, state, and local regulatory agencies and ENVIRON (or other District contractors);
- Communicate with school Principals on inspections and post related documents on the SMMUSD website;
- Monitor that the Inventory of Potentially PCB-Impacted Building Materials is maintained and updated for each school within the District;
- Ensure the employees of the District and schools who may involve in PCB-related activities receive appropriate training; and
- Keep records related to the Inspection Plan.

2.2.2 ENVIRON International Corporation (or other District contractors)

ENVIRON, as the consulting firm assisting the District, is responsible for the following:

- Prepare this Inspection Plan and updating the Plan if requested by the District;
- Coordinate school inspections with District and school staff;
- Conduct school inspections and documenting results; and
- Continue to work with USEPA Region IX on updating the Inspection Plan and evaluating inspection results as needed.

2.2.3 Oversight Regulatory Agencies

USEPA Region IX will be overseeing the implementation of this Inspection Plan. USEPA will be responsible for the following elements:

- Review and approve the Inspection Plan and ensure that the Plan provides appropriate procedures for identifying potential PCB-containing building materials; and
- Provide regulatory oversight for inspection findings and the District's implementation of the appropriate next steps.

2.2.4 Managers of Facilities or Designee(s)

Within the District, the Managers of Facilities or designees are responsible for assisting with coordination of inspection activities for potential PCB containing materials. The Managers or designee(s) are responsible for the following:

- Provide documents related to the construction history and past and future renovation or demolition activities at each school site;
- Assist with escorting the Inspector during the inspection, as needed by School Administration, and answer questions regarding operations and maintenance that arise before, during, and after the inspection.

2.2.5 School Administration

Individual school Principals or their designee should provide full support for the implementation of the Inspection Plan and are responsible for the following elements:

- Assist in coordination with the teachers and classrooms for initial inspection;
- Escort the Inspector during the inspection, or coordinate with the Managers of Facilities (or designee) to provide a knowledgeable escort during the inspection; and
- Post and/or distribute inspection notices in the school.

2.3 Communication

This Inspection Plan emphasizes timely and relevant communication on the building inspection process. If a school is identified for an inspection, the Inspector should notify school officials in

advance of the inspection so that school officials have sufficient time to notify parents, students, teachers, and other interested members of the public prior to the inspection.

To assist with this notification, the Inspector will prepare, in collaboration with SMMUSD, a fact sheet that describes the objectives, procedures, and timing of the inspection and will send that fact sheet to the main point of contact at the School Administration (e.g., Principal), who will be responsible for disseminating that information to the school's students and parents, teachers, and employees. The method in which this information will be shared will be determined on a case-by-case basis by each school, but may include mailings and/or postings of the fact sheet on the school website (if available). The fact sheet should include contact information for the SMMUSD in case members of the public or other interested parties want to ask questions or obtain more information.

As further discussed in Section 2.6 of this plan (Post-Inspection Activities), the Inspector will prepare a report after the inspection that summarizes key findings and recommendations. A copy of the report should be kept on file with the Superintendent of the SMMUSD for at least 7 years, and will be made available (e.g. keeping a copy in the school library) for interested members of the public should be allowed to review the report if they want to learn more details about the inspection.

2.4 Pre-Inspection Activities

Prior to performing the building inspection, the Inspector should conduct a screening analysis to evaluate if the school needs to be inspected. If the school does not satisfy the criteria that would indicate an inspection is not warranted, as described below, the Inspector should prepare for the on-site inspection. Additional information on these pre-inspection preparation activities is provided below.

2.4.1 Screening Procedures and Criteria

The Manager of Facilities or designee will provide the Inspector with construction and renovations records for each building at the school site. The following screening steps will be undertaken for each school prior to inspection based on these records:

- Based on the manufacturing and regulatory history of PCB-containing materials, school buildings that were constructed after 1980 will not be included in the building inspection process due to the low likelihood of finding PCB-containing materials.[3]
- For buildings that were constructed prior to 1981, the Inspector should request and review renovation and remodeling records to evaluate if original building materials that could have potentially contained PCBs have been previously removed, in which case the building can also be eliminated from the building inspection process.

Based on this screening analysis, the Inspector will generate a list of buildings at each school that should be inspected following the procedures outlined in Section 2.5.

[3] http://www.epa.gov/epawaste/hazard/tsd/pcbs/pubs/caulk/caulkresearch.htm.

2.4.2 Review of Background Information

For school buildings that are identified for inspection under the screening criteria outlined above, the Inspector should request and review additional relevant background information and documents from the Manager of Facilities or designee. The objective of this review is to gain familiarity with the school in an effort to streamline the inspection process.

The types of information that should be reviewed, if available, include (as applicable) general information about the school (e.g., number of students and teachers, hours of operation, occupancy patterns), detailed drawings showing building layout and configuration, previous environmental inspection and testing records and reports, environmental permits, heating and ventilation system details and usage patterns, material safety data sheets (MSDS) for building products, and existing operations and maintenance procedures. Records on planned renovations or demolitions should also be obtained and reviewed. The Inspector should also request information about the use and storage of potential PCB-containing materials and any known spills or releases (e.g., failed lighting ballasts, leaking transformers) on the premises.

2.4.3 Preparation for Inspection

The Inspector should assemble the documents and equipment needed for the inspection. Table 2-1 lists the general equipment and documents that the Inspector will most likely need. Note that the specific equipment needed for an inspection varies, and the Inspector should consider the equipment list on a case-by-case basis, taking into account important factors such as the location of the school, condition of the buildings, and types of potential PCB-containing materials.

Table 2-1: Types of Equipment and Materials Useful for an Inspection

General	Safety/Emergency
• Camera and memory card • Pocket calculator • Tape measure • Clipboard and notepad • Waterproof pens, pencils, and markers • Laptop computer • Global Positioning System (GPS) equipment • Site plans • Inventory data sheets • Agenda and rough schedule for inspection • Flashlight • Extra batteries	• Respirator with organic vapor cartridge • PCB resistant gloves (disposable, if possible) • Disposable footwear covers • Safety glasses • First-aid kit • Emergency telephone numbers • Fire extinguisher • Soap and towels • Ladder if not available at school site

2.5 Inspection Procedures

After completing the pre-inspection activities, the Inspector should then conduct the inspection on the pre-arranged date notified in communications as described in Section 2.3. The primary components of the inspection include an opening conference, visual assessment of the buildings with a focus on potential PCB-containing materials, and a closing conference. Additional details on each of these components of the inspection are provided below.

2.5.1 Opening Conference

The primary purpose of the opening conference is to provide the School Administration and District Administration with additional details on the purpose and scope of the inspection and to address any outstanding questions before commencing the inspection. The opening conference also serves as an opportunity for the Inspector to collect and review general facility information that may not have been available during pre-inspection activities, and to establish a rapport with the School Administration.

During the conference, the Inspector should cover a variety of topics, as outlined below:

- **General Information.** The Inspector should gather information regarding the official serving as the primary point of contact for the School Administration (e.g., title/position, length of time in position, familiarity with school buildings and usage patterns) and general activities occurring at the school (e.g., classroom instruction, physical education, cafeteria, after school activities).
- **PCB-Containing Materials at the School.** The Inspector should ask the School Administration how and where the school stores (and stored) and/or uses (and used) PCB-containing materials, if any. If the School Administration is not familiar with PCBs, questions about electrical equipment (e.g., lighting ballasts, electrical transformers) may provide appropriate information to locate PCBs in use or storage at the school. The Inspector should also inquire if the School Administration is aware of any spills or releases (e.g., failed lighting ballasts, leaking transformers) on the premises. If the School Administration is not familiar with these issues, they should invite the Manager of Facilities (or their designee) or other staff knowledgeable in historical information of the site's facilities to attend this conference.
- **Inspection Activities.** After going over the inspection objectives, the Inspector should describe the steps of the inspection.
- **Meeting Schedules.** If meetings with the School Administration are necessary, the Inspector should schedule them during this conference.
- **Access/Accompaniment.** The Inspector should request access to all areas of the school with potential PCB-containing building materials. The Inspector should request that someone familiar with the school (i.e., School Administration, Manager of Facilities) accompany him/her throughout the inspection.
- **Safety Requirements.** Evaluate what safety precautions (e.g., use of protective clothing) should be observed during the inspection.

- **Photographs.** The Inspector should advise the School Administration that the Inspector may use cameras or other electronic recording devices to document observations during the inspection. Inspectors should keep a log of the photographs taken with the name of the school, date, time, and name of the Inspector taking the photographs. If the School Administration does not allow photographs, the Inspector should continue to conduct the inspection without taking photographs, but instead make sketches, as needed.
- **Records.** The Inspector should identify any outstanding records that he/she would like to review.

2.5.2 Inspection

Following the opening conference, the Inspector should systematically identify and inventory potential primary sources of PCB-containing building materials for potential removal or to be managed in place with BMPs (Section 3) until renovation or demolition occurs. Based on information from the USEPA, the primary potential PCB-containing building materials likely to present in schools include lighting ballasts, electrical transformers, and caulk (including glazing) (USEPA, 2012; USEPA 2014b).[4] The inspection may also include other materials specific to the school under investigation if identified in pre-inspection activities (see example of other PCB-impacted materials in Appendix B). For each of these items covered by the inspection, the Inspector should assess the number/quantity, location, and condition of the materials.

In addition to evaluating the number/quantity, location, and condition of these primary potential PCB-containing materials, the Inspector should also evaluate the potential for human exposure to PCBs from these materials. To this end, the Inspector should document the room usage patterns (i.e., how often and how long a specific room is used for what function and by whom), particularly in the areas where the potential PCB-containing materials are located.

The types of construction materials for floor, wall, and ceiling, and the furniture should be recorded. Presence of sinks, bathrooms, and any other items in the rooms will be documented as well.

Finally, the Inspector should assess the heating, ventilation, and air conditioning (HVAC) system(s) at the school, such as the type of system(s), size of the system(s), hours of operation, condition, use of natural ventilation (i.e., open windows), and size of the room(s) serviced by the system(s). The Inspector should also review the cleaning history, if any, of the ductwork. The goal of this HVAC system assessment is to evaluate potential pathways that PCBs, if present, might travel through the building.

Below are some additional inspection guidelines for the primary PCB-containing materials mentioned above.

2.5.2.1 Lighting Ballasts

Schools in the United States built before 1981 may have PCB-containing fluorescent light ballasts (FLBs). The PCBs are contained within capacitors and interior potting material (a black,

[4] Although recent studies by USEPA have focused on lighting ballasts and caulk as primary sources of PCBs in schools, electrical transformers are also listed here because they were historically manufactured with PCBs.

tar-like substance that protects the internal electrical components) of the FLB. During FLB failure, the capacitors may leak a yellow, oily liquid and the potting material may escape from the FLB.

PCBs may be contained within T12 magnetic FLBs, but not T8 or T5 FLBs which are commonly used during lighting retrofits.[5] Depending on several factors—such as the number of operating hours, operating temperature, and on/off cycles—the typical life expectancy of a magnetic FLB is between 10 and 15 years (USEPA, 2013a). Thus, pre-1981 FLBs in lighting fixtures that are still in use are now far beyond their typical life expectancy.

The following criteria are provided to help identify FLBs that may contain PCBs (USEPA, 2013a):

- FLBs manufactured before July 1, 1979 may contain PCBs.
- FLBs manufactured between July 1, 1978 and July 1, 1998 that does not contain PCBs must be labeled “No PCBs.”
- If an FLB is not labeled “No PCBs,” the Inspector should assume it contains PCBs unless it is known to be manufactured after 1979.
- FLBs manufactured after 1998 are not required to be labeled.

To evaluate if a school has PCB-containing FLBs, the Inspector should conduct a visual inspection of the FLBs in a representative number of light fixtures opened by the school facilities representative.[6] For fixtures that will be inspected in detail, school maintenance staff may need to remove a portion of the fixture, such as the metal panel covering the FLB. If the FLBs do not have the statement “No PCBs,” the Inspector should contact the manufacturer and provide the light fixture brand, model number, and FLB serial number to evaluate whether the FLB contains PCBs. If the manufacturer is not sure whether the FLB contains PCBs, the Inspector should assume that the FLB has PCBs. Figure 2-1 depicts examples of FLBs with and without PCBs.

[5] The “T” designates the lamp that goes with the FLB as “tubular” shape. The number after the “T” represents the lamp diameter in eighths of an inch.

[6] FLBs that have similar characteristics can be grouped together for the purposes of this inspection. For example, the same type of FLBs in the same room with the same installation or retrofit history can be grouped together and each one does not need to be individually inspected.

A typical pre-1979 PCB-containing fluorescent light ballast (FLB)

A typical Non-PCB containing fluorescent light ballast. The ballast has a "No PCBs" marking on the top of the ballast and the text "electronic ballast". Only magnetic fluorescent light ballasts contained PCBs.

Figure 2-1: Comparison of FLBs with (top) and without (bottom) PCBs (USEPA, 2013a)

During the inspection, the Inspector should document the condition of the lighting fixtures that contain PCBs. Indications that a lighting fixture has failed or may fail in the near future include lights that do not work after bulbs are changed; evidence of oil stains on or below light fixtures; previous incidents of smoke or burning odors associated with the lights; and previous incidents that ballasts were removed or disassembled to replace parts of the fixture (USEPA, 2013b).

Figure 2-2 contains illustrative photographs of PCB-containing ballasts that have failed. If any of these conditions are observed during the inspection, the Inspector should notify the SMMUSD so that the leaking ballast can be removed and impacted areas remediated and that appropriate health and safety measures can be followed, such as removing furniture and other classroom objects from underneath the fixtures, covering the floor with plastic sheeting to capture any material that might leak from the FLB or fixture, and ventilating the room to reduce the potential for inhaling fumes (USEPA, 2013a). ENVIRON would coordinate with District staff on appropriate removal and health and safety procedures.

Figure 2-2a: Example of a Burst FLB (USEPA, 2013b)

Figure 2-2b: Example of Material Leaking from FLB (USEPA, 2013b)

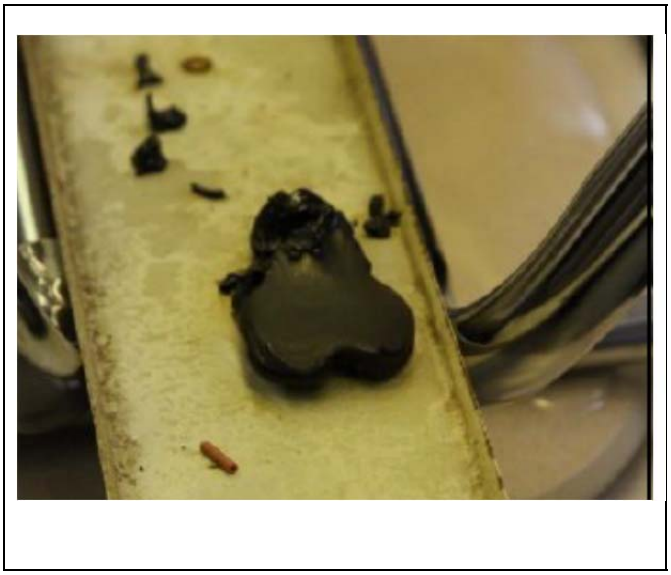

Figure 2-2c: Tar-like Potting Material from Failed FLB (USEPA, 2013b)

Figure 2-2d: Leaked Potting Material from FLB (USEPA, 2013b)

Figure 2-2e: Oily Stains on Lighting Fixture (USEPA, 2013b)

2.5.2.2 Electrical Transformers

A transformer is an electrical device that takes electricity of one voltage and changes it into another voltage. Electrical transformers are often filled with a dielectric liquid that serves to cool the device. While most modern transformers now use mineral oil or silicone as the dielectric coolant, many transformers were manufactured from 1929 to 1978 with PCBs in the dielectric fluid (USEPA, 2004). Figure 2-3 contains a picture of two typical PCB transformers.

Figure 2-3: Example of Two PCB Transformers (USEPA, 2004)

Generally, a transformer will have a nameplate attached to the unit indicating the name of the dielectric fluid and the approximate weight and volume of fluid. In accordance with the TSCA (40 CFR 761.40 (a)), proper PCB identification labels should be visible near the access to the transformers and also on the transformer itself.

Since PCBs were historically marketed under different names, the nameplate on a PCB transformer may not carry the specific term “PCBs.” Trade names for PCBs could include (USEPA, 2012):

- Abestol, Aroclor, Askarel, Chlophen
- Chlorextol, DK, EEC-18, Fenclor
- Inerteen, Kennechlor, No-Flamol, Phenoclor
- Pyralene, Pyranol, Saf-T-Kuhl, Solvol
- Non-Flammable Liquid

If the nameplate says “PCBs” or any of the names on the above list, then the transformer most likely contains PCBs. If the transformer's nameplate does not have any of the above labels, or if the label is missing or illegible, the utility company servicing the transformer should be able to tell the Inspector if the transformer contains PCBs.

The Inspector should inquire who owns and is responsible for each transformer at the school. Many schools may use outside contractors to service their transformers. In some cases, the electric utility providing service to the building may own the transformer, rather than the school.

The Inspector should also document any maintenance activities which may result in PCB exposure. Examples of maintenance activities may include sampling fluid to test dialectic strength; topping off the fluid; replacing gaskets, bushings, insulators, etc. which may involve partial draining of the unit; removing PCB liquid and refilling with replacement dielectric fluid; and generating waste liquid, contaminated rags, equipment, etc. which must be disposed of in accordance with applicable regulations (USEPA, 2004).

2.5.2.3 Caulk and Glazing

Caulk is a non-structural material used to fill cracks or holes, such as gaps in window and doorframes, masonry, and joints in buildings. Glazing is a similar material often used to fill gaps between glass and window frames to secure the glass. Between 1950 and 1979, PCBs were incorporated into caulk and glazing to increase its flexibility (USEPA, 2014a).

The presence or absence of PCBs in caulk and glazing cannot be ascertained through visual inspection. Therefore, the Inspector should document the locations, quantity/amount (e.g., linear feet), and condition (e.g., intact, cracking, flaking, etc.) of all caulk and glazing in the school. While it is possible that PCBs could be released into the environment through the cracking or flaking of caulk or glazing containing PCBs, USEPA has concluded that old caulk that is still flexible or in visibly good condition could be a significant source of PCBs into the air

(USEPA, 2014a). For caulk (including window and door glazing), areas that should be assessed include:

- Indoors: windows, ledges, doors, and floors
- Outdoors: windows, expansion joints, and concrete joints

Note areas where caulk is peeling, cracking, brittle or deteriorating or has been removed and replaced from a past renovation. Figure 2-4 contains examples of deteriorating caulk and glazing.

Figure 2-4a: Examples of Deteriorated Caulk (NYCSCA, 2012)

Figure 2-4b: Examples of Deteriorated Door and Window Glazing (NYCSCA, 2012)

2.5.3 Closing Conference

Following the inspection, the Inspector should hold an on-site closing conference with the School Administration and District's Facilities Managers to share preliminary findings from the inspection. During this conference, the Inspector should review the Inventory of Potentially

PCB-Impacted Building Materials. The Inspector can also use this opportunity to ask clarifying questions and ensure that all applicable areas of the school have been included in the inspection.

If the Inspector observes any PCB leaks, spills, or other problems that may need immediate attention (e.g., failed lighting ballast), the Inspector will inform the School Administration and the Superintendent of the SMMUSD and provide instructions on immediate actions, including immediate removal of the ballasts and cleaning of the area with proper procedures by trained personnel. Finally, the Inspector should provide the School Administration with an estimated timeframe for producing a report that will summarize findings and recommendations based on the inspection.

2.6 Post-Inspection Activities

After the inspection, the Inspector should document his/her findings and recommendations in a report, evaluate if any items should be sampled for PCBs, and incorporate findings into Best Management Practices. Additional information on each of these post-inspection activities is provided below.

2.6.1 Building Inspection Report

Within the timeframe established during the closing conference, the Inspector should prepare a report that summarizes findings and recommendations based on the inspection. At a minimum, the report should include the following:

- Summary of background information (e.g., age and construction/renovation history of the buildings, including any current or future activities which could potentially impact the conditions of potential PCB-containing materials);
- Details on the sources of information (e.g., records reviewed, points of contact);
- Inventory of Potentially PCB-Impacted Building Materials which includes quantity, location, and condition of those materials. The report should contain a photo log that documents key visual observations from the inspection; and
- Recommendations for next steps (e.g., sampling, BMPs).

The report will first be submitted in draft format to the Superintendent of the SMMUSD for him/her to review and comment and to solicit the comments from the School Administration and Managers of the Facilities. Following incorporation of comments from the SMMUSD, the report will be submitted to EPA for review. A final report will be submitted to the SMMUSD. As discussed above, the School Administration should keep a copy of this report on file for at least 7 years and should make the report available to interested parties.

2.6.2 Recommendation for Further Evaluation

During the inspection, the Inspector may notice certain suspect PCB-containing materials present in the school environment. Based on the findings, some of the typical recommendations that would be made include the following:

- If ballasts that contain PCBs are identified, they will be removed by appropriately trained personnel given past USEPA research indicates that PCB-containing light ballast may contribute to airborne concentrations of PCBs above USEPA health-based thresholds (USEPA, 2012c).
- Based on the conditions of other potential PCB-containing materials, including caulking, appropriate procedures provided in the BMP Plan (Section 3) will be followed until a planned renovation or demolition of the building.
- Regulatory oversight for the inspection and recommendations will be provided by USEPA. If characterization of the PCB-containing materials is warranted, procedures developed in the PCB-Related Building Materials Characterization, Removal and Cleanup Plan (Section 4) will be followed to conduct the sampling of the PCB materials. Additional details on cleaning techniques are provided under the BMP Plan.

If sampling for PCBs is recommended based on the findings of the inspection, it would be conducted after the implementation of BMPs and in accordance with the methods described in Sections 4.2.2 and 4.3.3.4).

2.6.3 Incorporation of Findings into Best Management Practices

Information gathered during the inspection on the types, locations, quantities/sizes, and conditions of PCB-containing materials will be used to select appropriate BMPs for those materials.

3 PCB Best Management Practices

3.1 Purpose

The purpose of this PCB Best Management Practices Plan (BMP Plan) is to establish procedures to appropriately manage PCB-containing building materials potentially present in the schools of SMMUSD and to minimize exposures potentially encountered by students and schoolteachers and staff prior to the PCB-containing materials being removed.

3.2 Applicability of the BMP

The BMP Plan will be generally applicable for the school buildings within SMMUSD that were built or renovated prior to 1981. The Inventory of Potentially PCB-Impacted Building Materials listing the applicable buildings for each school will be developed upon the completion of the building inspections to be conducted by ENVIRON (or other District contractors) as described in Section 2.

3.3 Responsibilities

3.3.1 Superintendent or Designee

The Superintendent of the SMMUSD or designee is responsible for overall implementation and management of the BMP Plan. These responsibilities include, but are not limited to, the following:

- Review the BMP Plan initially;
- Periodically review the BMP Plan and propose changes if necessary;
- Coordinate with federal, state, local regulatory agencies and ENVIRON;
- Communicate with school Principals for PCB related matters, post related documents on the SMMUSD website, and distribute PCB awareness materials;
- Ensure the employees of the District and schools who may involve in PCB-related activities receive appropriate training;
- Ensure that the Inventory of Potentially PCB-Impacted Building Materials is maintained and updated for each school within the District; and
- Keep records related to the BMP Plan and training.

3.3.2 ENVIRON International Corporation (or other District contractors)

ENVIRON as the consulting firm assisting the District is responsible for the following:

- Prepare this BMP Plan and updating the Plan if requested by the District;
- Develop procedures to minimize the potential exposures to PCBs by the students and the school teachers, and staff;
- Develop and providing BMPs training to staff including health and safety and appropriate cleaning techniques;
- Conduct post-cleaning verification;

- Work with USEPA to evaluate the appropriate abatement methods for damaged PCB materials;
- Oversee the repair of damaged known or suspected PCB materials when such action is deemed appropriate; and
- Prepare written documents such as a PCB sampling plan, specifications for repair, and post-cleaning verification report, and submitting them to the District and, if needed, to USEPA.

3.3.3 Oversight Regulatory Agencies

USEPA Region IX will be overseeing the District's implementation of this BMP Plan. USEPA will be responsible for the following elements:

- Review and approve the BMP Plan and ensure that the Plan provides adequate measures for PCB exposure controls until renovation and demolition; and
- Provide regulatory oversight for repair and post-cleaning verification, etc.

3.3.4 Managers of Facilities or Designee(s)

Within the District, the Managers of Facilities or designees are responsible for assisting with implementation of the BMP plan and coordination of related activities. These Managers or designees are responsible for the following:

- Participate in the BMP training;
- Conduct and/or coordinate periodic inspections of suspected or known PCB materials, document observations, and update the Inventory of Potentially PCB-Impacted Building Materials for each school (initial inventory developed as part of the initial inspection described in Section 2);
- Ensure that appropriate cleaning tools are used by the custodial workers;
- Conduct periodic inspections to ensure that proper cleaning and HVAC maintenance procedures are followed by staff;
- Approve and sign Uniform Hazardous Waste Manifests and other documentation required for disposal of PCB wastes, as needed; and
- Notify the Superintendent, USEPA, and ENVIRON of the presence of previously unidentified suspect PCB materials.

3.3.5 School Administration

Principals or designees at individual schools should provide full support for the implementation of the BMP Plan and are responsible for the following elements:

- Assist in coordination with the teachers and class rooms for periodic inspection and repair, as deemed necessary; and
- Post and/or distribute PCB awareness materials in the school.

3.3.6 Custodial Workers

Custodial workers are responsible for the implementing the following elements in areas designated as having potential PCB-containing building materials:

- Eliminate dry sweeping, mopping, and dusting from all cleaning activities;
- Start using vacuum cleaners equipped with High Efficiency Particulate Air (HEPA) filters;
- Participate in the BMP training as outlined in Section 3.11 below;
- Utilize appropriate BMPs during cleaning activities where potential contact with PCB containing building materials may occur;
- Use appropriate tools/equipment to conduct cleaning for the buildings with PCB containing materials;
- Clean school buildings following the procedures set forth in Section 3.4;
- Visually inspect the conditions of building materials during cleaning; and
- Report to the Supervisor/Manager any damaged known or suspected PCB-containing materials.

3.3.7 Maintenance Employees

Maintenance employees and contractors are responsible for the following elements:

- Participate in the BMP training as outlined in Section 3.11;
- Obtain special training on repairing options for PCB materials;
- Know the locations of suspected or known PCB materials in the campuses;
- Utilize appropriate BMPs during maintenance activities where potential contact with PCB-containing building materials may occur;
- Report to the Manager any damaged known or suspected PCB materials;
- Appropriately operate, regulate, and maintain the heating, ventilation, and air-conditioning (HVAC) systems;
- Inspect the HVAC systems and repair or request services of specialists to repair the HVAC systems;
- Do not dry sweep or dust; and
- Use vacuums equipped with HEPA filters to clean up dust and debris.

3.3.8 Contractors

Contractors who perform general maintenance and repair should review related information with a Manager of Facilities to evaluate if the work area has suspected or known or assumed PCB-containing materials and avoid any activities that may potentially disturb PCB materials.

3.4 Cleaning and Inspection Procedures

To reduce the amount of dust that can become airborne in the school buildings, the Managers of Facilities or designee should monitor the cleaning procedures of the custodial workers in areas identified as potentially containing PCB building materials as described below:

3.4.1 Routine Cleaning

- Once a week:
  - Clean hard flooring (i.e. vinyl tiles, painted/sealed concrete, wood) using mops treated with water (or water-based, non-toxic additives);
  - Clean carpeting or rugs using a vacuum equipped with HEPA filters; and
  - Wash mirrors, powder shelves, and enameled surfaces in lavatories, as well as sinks, commodes, and urinals.
- Once a month:
  - Clean the air distribution devices (registers, grilles & diffusers):
  - Wipe all accessible surfaces with a dampened cloth, including, but not limited to, walls, shelves, baseboards, door frames, door knobs, furniture, fixtures, window sills, and any other accessible portions; and
  - Clean the interior of waste receptacles with dampened wipe clothes, and wash as necessary. Visually check the areas after cleaning.

3.4.2 Annual Cleaning

A thorough cleaning of the HVAC systems should be scheduled once a year when the schools are not occupied for a relatively long-time, i.e. spring, summer, or winter break. Upon completion of the HVAC cleaning, all surface areas, where dust accumulation could occur, shall be cleaned. Wet methods should be used. Non-toxic disinfectant can be applied, if necessary.

The components of the HVAC system units should have a thorough cleaning by appropriately trained personnel:

- Clean blowers, fan housings, plenums (except ceiling supply and return plenums), scrolls, blades or vanes, shafts, baffles, dampers, and drive assemblies, where applicable. All visible surface deposits shall be removed without introducing dust to the air by using wet methods. A suitable operative drainage system should be in place prior to beginning wash down procedures.
- Clean all coils and related components, including evaporator fins.
- Negative air pressure that will draw dust to a HEPA vacuum collection system should be maintained at all times in the duct cleaning area to minimize migration of dust into occupied areas.
- Clean air distribution devices (fresh air intakes, registers, grilles, & diffusers).

3.4.3 Cleaning of Tools and Equipment

Tools and equipment should be cleaned so that cross contamination and dirt buildup is minimized. The following procedures should be followed:

- Cloth, sponge, and mop should be cleaned before being used for a different location;
- Water buckets should be cleaned periodically to avoid dirt buildup;
- The HEPA vacuum cleaner should be inspected periodically for signs of dirt buildup in the interior and exterior surfaces. If present, dirt should be completely cleaned with wipes.
- HEPA filters should be replaced periodically per the recommendations of the manufacturers of the filters and used filters should be disposed of properly.

3.5 Heating, Ventilation, and Air Conditioning Systems

Adequate ventilation in the rooms helps reduce the potential for accumulation of PCBs in the indoor air. Ventilation provided for the rooms in the SMMUSD campuses includes one or more of the following:

- Open windows
- Unit ventilators
- Central exhaust system

Unit ventilators and central exhaust systems are collectively referred as part of the HVAC system in this BMP Plan. Windows should be opened, if weather allows, and ventilation systems should be turned on prior to the start of the school in the morning to dilute any potential accumulation of PCB in the air overnight and the rooms should continue to be ventilated when they are occupied.

To help appropriate operation of the ventilation system and minimize potential PCB concentrations in air, maintenance employees should:

- Conduct routine and annual cleaning for the HVAC system as described in Section 3.4;
- Monitor that the airflow is not obstructed;
- Use filters with a minimum efficiency reporting value (MERV) of 14, or highest for which the HVAC system is designed if it cannot accommodate MERV 14 filters, and inspect and change them at the frequency recommended by the manufacturer or every 6 months, whichever comes sooner;
- Conduct or assist in annual maintenance overhaul for the HVAC system, including the ducts;
- Lubricate fan motors as necessary and keep them clean; and
- Adjust fresh air inlet dampers on supply fans or heating stacks when necessary.

3.6 PCB Material Condition Inspection and Reporting

The Managers of Facilities will perform detailed inspections of PCB-containing materials at the schools once a year. The primary goal of these inspections is to visually check and document the conditions of suspected or known PCB materials that are in the Inventory of Potentially PCB-Impacted Building Materials. The observed conditions should be documented and updates should be made to the school's Inventory of Potentially PCB-Impacted Building Materials, when necessary. When damaged or deteriorated PCB materials are observed, the manager or designee should take immediate action to secure the area and consult ENVIRON for further steps.

The custodial workers or maintenance employees should also report to their managers for any damaged/deteriorated PCB-containing materials noticed during the routine or annual cleaning.

3.7 Procedures for Deteriorated PCB-Containing Materials

3.7.1 Immediate Action

- If the deteriorated potential PCB-containing materials are observed, the Managers of Facilities should be notified.
- Maintenance employees under the supervision of the Manager will install a temporary barrier (e.g. metallic tape) to cover deteriorated potential PCB materials prior to its repair, encapsulation, or removal and place caution signs or tape around the area. Unless authorized in writing by USEPA, the temporary barrier shall be used for no longer than two weeks after the deteriorated material is first identified.
- The Manager should communicate with ENVIRON (or other District contractor) about the observation of the damaged PCB materials.
- ENVIRON (or other District contractor) will evaluate the damaged PCB materials and under the guidance of USEPA evaluate appropriate abatement efforts among the options listed in Sections 3.7.2 through 3.7.4.
- Once the option is selected, the Facilities Manager or ENVIRON, if requested by the District, will coordinate an abatement action.

3.7.2 Options to Rectify the Identified, Deteriorated Materials

3.7.2.1 Patch or Repair

Before starting patch or repair, the work area should be set up with 6-mil poly protection to minimize dust accumulating on the nearby surfaces and collect debris. Movable furniture should be placed in a different area. If deemed necessary, containment with negative pressure should be erected. The HVAC system should be isolated by blocking the air distribution openings with plastic sheeting or other appropriate means. Dust generation should be minimized by using wet method and/or HEPA filter vacuuming during patch or repair. The workers should wear appropriate PPE, including, gloves, Tyvek suit, and shoe cover.

After patch or repair, the immediate surfaces should be vacuumed with a HEPA-filtered vacuum cleaner and then wiped with wet cloth. The work area should be visually inspected to monitor that no dust or debris is present and re-clean the area thoroughly if dust or debris is identified.

All the waste and contaminated items should be placed in a sealed container or bag for appropriate disposal.

When the damaged materials is suspected to contain asbestos (>1%), asbestos remediation procedures should be followed and the repair or patch can only be conducted by asbestos certified workers.

3.7.2.2 Encapsulation of PCB Materials

Encapsulation is a commonly used abatement technique that reduces PCB contamination in buildings. Encapsulation is accomplished by painting the surface(s) of PCB materials with a coating material that serves as a barrier to minimize the release of a contaminant from a source.

Effective encapsulants can reduce PCB concentrations at the exposed surfaces and eventually in indoor air.[7] Generally, coating materials that are better at resisting the migration of PCBs from the source tend to perform better at reducing the concentrations of PCBs on the surfaces and in indoor air. Resistance to PCB migration is the key in selecting the most effective encapsulants for PCB sources. If the District selections encapsulation as an abatement options, the procedure in Section 4 will be followed.

3.7.2.3 Protocols Applicable to Removal of PCB Materials

When deteriorated PCB materials cannot be repaired, they should be encapsulated or removed following the procedures described in Section 4.

3.8 Post-Cleaning Validation and Corrective Action

3.8.1 Validation

Post-cleaning validation will be conducted to evaluate the effectiveness of the BMP Plan, which can be performed by the Facilities Managers or designees. After each monthly cleaning, the post-cleaning validation will include the following activities in representative locations:

- Observe if there is any visible dust accumulation in the rooms. If dust is observed, the surface(s) will be re-cleaned.
- Upon passing the visual inspection, assess the cleanness of the surface by swiping the surfaces with a hand wearing a white glove to assist in visual assessment. If dust or discoloration is observed on the glove, the surface(s) will be re-cleaned.
- White-glove inspections will be conducted after each monthly cleaning.

3.8.2 Corrective Actions

Surfaces that do not pass the white-glove test will be re-cleaned.

3.9 PCB Waste Disposal

The used HEPA filters for the vacuum cleaners and collected dusts should be stored in designated containers. Other PCB waste, such as debris, could be also generated when

[7] Laboratory Study of Polychlorinated Biphenyl (PCB) Contamination and Mitigation in Buildings, Part 3. Evaluation of the Encapsulation Method. EPA/600/R-11/156B, April 2012.

repairing or encapsulating damaged PCB materials. A composite sample may be collected from each container to characterize the waste following the procedures described in Section 4. Information collected during implementation of the plan at MHS will be incorporated into future revisions to this section.

USEPA regulations on PCB waste disposal (40 CFR 761) should be followed to handle the waste. Waste exceeding 50 ppm of PCBs will be transported for off-site disposal at a Hazardous Waste landfill approved by USEPA. If the waste contains less than 50 ppm PCB, it will be transported for off-site disposal at a Non-Hazardous landfill approved by USEPA.

3.10 Communication and Education

The SMMUSD will distribute to the relevant schools PCB awareness materials. The schools will share the awareness materials with teachers, staff, and the school community by maintaining copies in the front office or in another suitable location in the campus. The materials shall be available in languages other than English, based on each individual school's need.

The SMMUSD will also post the inspection and sampling reports and other information to the SMMUSD website for interested people to review.

Students should be encouraged to wash hands with soap often and before eating and drinking. Hand wash instruction posters can be placed near the sinks to remind the students to wash hands thoroughly and use soap.

Teachers and students should try to keep the classroom in an organized and neat fashion.

3.11 Training

3.11.1 General BMP Training

The responsible parties included in this BMP Plan should receive this general BMP training on the following topics:

- The purpose of this BMP Plan;
- General information about PCB;
- Health hazards of PCB exposures;
- Overview of PCB regulations (USEPA, DTSC, and California Division of Occupational Safety and Health [Cal/OSHA])
- Recognition of damaged or deteriorated PCB-containing materials;
- Immediate action when damaged suspected or known PCB materials are discovered;
- Appropriate housekeeping cleaning procedures;
- HVAC maintenance and operation procedures;
- Appropriate PPE for activities handling potential PCB materials;
- Personal hygiene; and

- Appropriate disposal of PCB waste

3.11.2 PCB Materials Handling Training

Activities that likely disturb PCBs and are covered by this BMP Plan include repairing the damaged potential PCB-containing materials. These activities should only be carried out by appropriately trained building maintenance employees under the supervision of the department manager and/or ENVIRON. The training will include techniques on repair, tools, protection against PCB exposures, elimination of PCB waste, safety of workers and the environment.

3.11.3 Training Format, Venue, and Schedule

ENVIRON will develop the training materials and will provide the training. All current employees who are included in this BMP Plan should participate in the initial training when the BMP Plan is approved and implementation begins. New staff should have the training before they start the work involving potential PCB-containing materials. Refresher training should be conducted once a year, which may be provided by ENVIRON or a qualified person at the SMMUSD.

3.12 Recordkeeping

The following records related to the BMP Plan will be maintained for 7 years.

Document	Retention Location
BMP Plan	Plan to be kept in the SMMUSD and relevant schools
PCB Inventories	Records to be maintained in SMMUSD
Disposal manifests	Records to be maintained in SMMUSD
HVAC operation log	Records to be maintained on site
HVAC inspection log	Records to be maintained on site
Post cleaning validation and inspection	Records to be maintained in SMMUSD
PCB repair documents	Records to be maintained in SMMUSD
Training records	Records to be maintained in SMMUSD

4 PCB-Related Building Materials Characterization, Removal and Cleanup Plan

4.1 Purpose

ENVIRON has prepared this PCB Characterization, Removal and Cleanup Plan on behalf of the SMMUSD. Sections of this plan related to characterization, removal and cleanup of building-related materials are intended to comply with USEPA requirements for a risk-based cleanup per 40 CFR 761.61(c) and disposal per 40 CFR 761.61(a). Sections of this plan related to characterization, removal, and cleanup of soil are intended to comply with USEPA guidance on PCB-containing building materials (USEPA, 2005); depending on findings for soils, the California Department of Toxic Substances Control (DTSC) could also be involved.

The current approach for managing Potentially PCB-impacted Building Materials at SMMUSD facilities is to: 1) conduct comprehensive visual building inspections (see Section 2); and 2) implement BMPs to manage building materials in place (see Section 3) until renovations and/or demolitions are scheduled. A schedule for planned renovations and/or demolition of all SMMUSD facilities is not presently available but would be collected during the building inspections. However, characterization, removal, and cleanup of building materials will occur as the first step of renovation and/or demolition once these activities are scheduled.

The purpose of this plan is to establish general procedures for characterizing, removing, cleaning up, and disposing of PCB Bulk Product Waste (e.g. caulk, paint, mastics and sealants), PCB Remediation Waste (e.g., impacted building materials and certain adjacent ground surfaces), Excluded PCB Product (e.g., caulk, paint, mastic and sealants), and non-regulated building materials. This document is meant to serve as the general work plan for facilities currently in the SMMUSD. A site-specific, detailed scope of work will be provided to USEPA and DTSC (as appropriate, where soils are potentially impacted by PCBs), for review and approval for each facility where renovations and/or demolitions are scheduled prior to the initiation of the renovations or demolitions.

4.1.1 Plan Organization

This Characterization, Removal, and Cleanup Plan is organized into the following sections:

- Section 4.2 – Characterization of Building Materials and/or Soil – This section provides a description of the materials to be analyzed and the sample collection methods and laboratory analytical methods to be used in accordance with the Toxic Substances Control Act (TSCA) recommendations and regulations.
- Section 4.3 – General Proposed Remediation Plan – This section presents general procedures to be followed during the remediation and verification process, as well as proposed remediation and verification procedures for different PCB-containing or affected materials encountered during the project. This section also details post-remediation activities, including data usability assessments and PCB waste disposal procedures.

4.1.2 Roles and Responsibilities

The parties involved in the project as described in this plan are identified below.

4.1.2.1 Superintendent or Designee

The Superintendent of the SMMUSD or designee is responsible for overall implementation and management of this PCB Characterization, Removal, and Cleanup Plan. These responsibilities include, but are not limited to, the following:

- Review this PCB Characterization, Removal and Cleanup Plan initially;
- Periodically review this PCB Characterization, Removal and Cleanup Plan and propose changes if necessary;
- Coordinate with appropriate regulatory agencies and ENVIRON (or other District contractors);
- Communicate with school Principals on characterization, removal and cleanup activities, and post related documents on the SMMUSD website;
- Ensure the employees of the District and schools who may involve in PCB-related activities receive appropriate training; and
- Keep records related to this PCB Characterization, Removal, and Cleanup Plan.

4.1.2.2 ENVIRON International Corporation (or other District contractors)

ENVIRON, as the consulting firm assisting the District, is responsible for:

- Preparing this PCB Characterization, Removal and Cleanup Plan and updating it if requested by the District;
- Preparing site-specific work plans for individual school facilities within the District;
- Coordinating characterization, removal and cleanup activities with District and school staff;
- Overseeing general contractors and remediation contractors engaged by ENVIRON to complete these activities;
- Documenting results of characterization, removal and cleanup activities;
- Working with USEPA Region IX to define the risk-based values for PCBs and
- Working with USEPA Region IX on this PCB Characterization, Removal and Cleanup Plan and its results as needed.

4.1.2.3 Oversight Regulatory Agencies

USEPA Region IX will be overseeing the implementation of this PCB Characterization, Removal, and Cleanup Plan. USEPA will be responsible for the following elements:

- Reviewing and approving this PCB Characterization, Removal and Cleanup Plan; and
- Providing regulatory oversight for characterization, removal, and cleanup activities.

DTSC will oversee soil sampling and soil remediation if the soil data are collected under DTSC's Preliminary Environmental Assessment (PEA) program.

4.1.2.4 Managers of Facilities or Designee(s)

Within the District, the Managers of Facilities or designees are responsible for assisting with coordination of characterization, removal, and cleanup activities.

4.1.2.5 School Administration

Individual school Principals or their designee should provide full support for the implementation of this PCB Characterization, Removal, and Cleanup Plan and are responsible for assisting in its execution.

4.2 Characterization of Building Materials and/or Soil

Once a planned building renovation or demolition is scheduled, characterization of building materials and/or soil, as appropriate, will be conducted for the relevant facility buildings, as described below.

A building inspection, including a visual survey, will be conducted in each area of the school (see Section 2). For areas identified as containing Potentially PCB-impacted Building Materials, representative samples of building materials and soils will be collected for laboratory analysis prior to commencement of renovation or demolition work. In accordance with USEPA regulations and guidance documents, this section provides a description of the materials to be analyzed, sample collection methods, and laboratory analytical methods to be implemented.

During PCB characterization activities, representative samples may be collected, as necessary, from the following media: soil, caulk, paint, mastics, sealants, wood, brick, concrete, nonporous building materials and any other building material suspected to contain PCBs.

PCB characterization sampling will be conducted to evaluate the nature and extent of PCBs present in buildings materials and/or soil. Based on the results of characterization sampling, specific areas will then be targeted for PCB remediation, as appropriate based on the concentrations of PCBs identified.

4.2.1 Health and Safety Plan

A site-specific Health and Safety Plan (HASP) will be prepared prior to the initiation of PCB characterization and remediation activities. The HASP will detail safety organization, procedures, and personal protective equipment that are based on an analysis of potential site-specific hazards. The HASP will meet the requirements of 29 CFR 1910 and will include, but will not be limited to, the following components:

- Identification of key personnel: All on-site personnel involved with the characterization and remediation activities will be required to maintain Occupational Safety and Health Administration (OSHA) 40-hour Hazardous Waste Training (29 CFR 1910.120) and the corresponding 8-hour refresher course update.
- Training: A description of health and safety training requirements for supervisory and on-site personnel will be presented.

- Medical Surveillance: A description of appropriate medical examinations required for supervisory and on-site personnel.
- Site Hazards: A description of chemical, physical, and climatological hazards associated with the remediation project.
- Work Zones: A description of the work zones that will be established during characterization activities.
- Personnel Safety Equipment and Protective Clothing: A description of personnel protective equipment (PPE) and protective clothing to be used and available on site.
- Equipment Cleaning: The methods and procedures for decontamination of personnel, materials, and equipment will be described.
- Standard Operating Procedures and Safety Programs as required by applicable portions of 29 CFR 1910.

4.2.2 General Sampling Procedures for Building Materials

All sampling locations will be kept wet and polyethylene drop cloths will be used to minimize accidental contamination of surrounding building materials and soil during the sampling process. Durable field sampling equipment will be decontaminated prior to each sample location to mitigate the potential for cross-contamination of samples. Each component of the sampling device will be decontaminated or replaced with a new, dedicated or disposable component prior to collecting samples for laboratory analysis. All non-disposable sampling equipment will be subject to decontamination procedures prior to sampling, consistent with 40 CFR 761.79. If gloves come into contact with sample media, a new pair of clean, Nitrile gloves will be used at each location.

Porous surfaces, including soft porous surfaces (e.g. caulk, mastic and sealants), and hard porous surfaces (e.g. wood, concrete, brick), will be sampled in accordance with the USEPA Region I Standard Operating Procedure (SOP) for Sampling Porous Surfaces for Polychlorinated Biphenyls (May 2011), included as Appendix C of this document. In accordance with this SOP, at least three samples will be collected from each porous surface from each location identified.

Soft porous surfaces will be collected at 0.5-inch depth intervals using a metal chisel or sharp knife. The chisel or knife will be decontaminated between samples. If adjacent media is inadvertently removed in the process of sample collection, this media will be physically removed from the soft porous material prior to placement in the sample container.

Hard porous surfaces will be ground into powder using an impact hammer drill with a carbide drill bit. Powdered sample will be collected and placed in a sample container. Samples will be collected in 0.5-inch depth intervals and powder from adjacent holes may be composited to ensure sufficient sample volume. The drill bit will be decontaminated between samples.

Wipe samples will be collected on nonporous surfaces (i.e. metal, etc.) in general accordance with the standard wipe test as defined in 40 CFR 761.123. All samples will be collected from the prescribed 100 cm^2 area using a laboratory-prepared hexane-soaked gauze pad.

All samples will be logged on standard chain-of-custody forms and stored on ice for delivery to an approved laboratory. All samples will be extracted using USEPA Method 3540C (Soxhlet Extraction) and analyzed for PCBs using USEPA Method 8082. In addition to the primary samples, a field duplicate, a matrix spike and matrix spike duplicate (MS/MSD), and an equipment blank will be collected at a frequency of 1 per 20 primary samples, which is consistent with USEPA protocol for quality assurance/quality control (QA/QC) purposes.

The locations, spacing, and number of samples for building materials will be developed on a site-specific basis for each building and in consideration of the previously completed building inspection results (see Section 2). This information will be included in the site-specific work plan.

4.2.3 General Sampling Procedures for Soil

If available, ENVIRON will review previous soil sampling data prior to the start of work. Soil sampling will be conducted in accordance with generally accepted procedures for collecting surface soils for the purpose of environmental analysis. A portable sampler lined with sleeves will be used to collect soils from the specified sample depth (e.g., 0 to 6 inches below ground surface [bgs]). Soils will then be homogenized and transferred to an appropriate sample container provided by the analytical laboratory.

The locations, spacing, and number of soil samples will be developed on a site-specific basis for each building and in consideration of the previously completed building inspection results (see Section 2). This information will be included in the site-specific work plan.

All soil samples will be logged on standard chain-of-custody forms and stored on ice for delivery to an approved laboratory. All samples will be extracted using USEPA Method 3540C (Soxhlet Extraction) and analyzed for PCBs using USEPA Method 8082. In addition to the primary samples, a field duplicate, a matrix spike and matrix spike duplicate (MS/MSD), and an equipment blank will be collected at a frequency of 1 per 20 primary samples, which is consistent with USEPA protocol for QA/QC purposes.

DTSC will oversee soil sampling if the soil data are collected under DTSC's PEA program.

4.2.4 Characterization Summary Report and Site-Specific PCB Remediation Work Plan

Upon completion of PCB characterization activities, and evaluation of the data, a PCB Characterization Summary Report will be prepared describing the areas where PCB-impacted media were identified. This report will include the following information:

- A summary of the characterization methods, including sampling methodology and analytical techniques used;
- A tabular summary of the characterization sampling data;

- A description of the PCB-impacted media and waste classification pursuant to TSCA; and
- Approximate quantity of PCB-impacted media.

The PCB Characterization Summary Report will be prepared and submitted to USEPA as part of the PCB Remediation Work Plan if results indicate remediation is necessary. The report will also be available to the public.

If PCBs are detected at levels requiring remediation, a site-specific PCB Remediation Work Plan will also be prepared and submitted to USEPA and DTSC, if needed, for review and approval before remedial activities are initiated. The site-specific PCB Remediation Work Plan will also be provided for public comment. The site-specific PCB Remediation Work Plan will be conducted in accordance with the procedures described below in Section 4.3 and will indicate whether the remediation planned will comply with either:

- 40 CFR 761.61(a): Self-implementing on-site cleanup and disposal of PCB Remediation Waste; and/or
- 40 CFR 761.61(c): Risk-based disposal approval.

The site-specific PCB Remediation Work Plan will include building-specific details related to the scope of work including, but not limited to, the following:

- Area(s) of the school facility where renovation/demolition is proposed;
- Building materials and/or equipment (e.g. ballasts, transformers, etc.) identified as potentially containing PCBs during previous visual building inspections;
- Proposed areas for PCB remediation;
- Approximate schedule for PCB remediation activities;
- Proposed remediation approach where different from the approaches described herein; and
- A Means and Methods Plan for the contractor(s) conducting the remedial activities.

In addition, the site-specific PCB Remediation Work Plan will be provided for public comment.

4.3 General Proposed Remediation Plan

This plan has been developed to establish procedures for removing, cleaning up, and disposing of PCB-affected media encountered during materials characterization at SMMUSD facilities. Throughout implementation and upon its completion, each step of the remediation will be evaluated to determine whether any plan modifications should be made prior to continuing with the remedy implementation in other areas. A summary of remediation procedures is presented below, as well as a general overview of the proposed remedial activities for each of the potentially affected media. The evaluation and establishment of work areas will be based on site-specific conditions.

4.3.1 Overview of Proposed Remedial Activities

The remediation plan proposed herein is a combination of a removal and off-site disposal of PCB Bulk Product Waste under 40 CFR 761.62 with a self-implementing cleanup and disposal under 40 CFR 761.61(a) and/or a risk-based cleanup and disposal request prepared in accordance with 40 CFR 761.61(c) for PCB Remediation Wastes (soils, concrete, etc.).

4.3.1.1 Building Materials

Based on the results of the characterization of building materials and adjacent building materials, PCB-impacted materials will be sorted and classified into the following four categories, as defined in 40 CFR 761.3:

- PCB Bulk Product Waste - caulk, paint, mastic and sealants containing ≥ 50 parts per million;
- Excluded PCB Product - caulk, paint, mastic and sealants containing <50 ppm PCBs;
- ≥50 ppm PCB Remediation Waste - building materials (e.g. concrete, brick, etc.) containing ≥ 50 ppm PCBs; and
- <50 ppm PCB Remediation Waste – building materials (e.g. concrete, brick, etc.) containing > 1 ppm and < 50 ppm PCBs.

Nonporous building materials formerly in direct contact with PCB Bulk Product Waste may be decontaminated with a chemical wash and, upon meeting the USEPA high-occupancy cleanup levels of 10 micrograms (µg)/100cm^2), may be reused on site.

Residual concentrations of PCBs on surfaces made of porous building materials may remain in place and be encapsulated by a protective coating (following PCB Bulk Product Waste removal) to minimize direct contact with PCBs and/or potential migration effects to other media. The on-site encapsulation would be an interim solution, and appropriate disposal of any remaining PCB wastes would be required upon removal of the material or at the time of structure demolition.

4.3.1.2 Soils

Based on the results of the characterization of soil, soil will be excavated and segregated into the following categories, as defined in 40 CFR 761.3:

- ≥50 ppm PCB Remediation Waste - soil containing ≥ 50 ppm PCBs
- <50 ppm PCB Remediation Waste - soil containing > 1 ppm and < 50 ppm PCBs

Through removing the source materials, excavating and disposing of the PCB-containing materials scheduled for removal off site, reusing (by decontaminating to USEPA high-occupancy cleanup levels or risk-based levels), and encapsulating surfaces that contain residual PCBs, the proposed remediation plan removes those PCB-containing materials not authorized for continued use and either removes or restricts exposure pathways to residual PCBs, thereby, not posing an unreasonable risk of injury to health or the environment.

4.3.2 Notification

Per regulatory requirements, notification will be provided to the USEPA, DTSC, local government agencies, and the public prior to starting any removal or cleanup activities at SMMUSD facilities.

4.3.3 Health & Safety, Site Preparation, Engineering Controls and Air Monitoring

4.3.3.1 Health and Safety

Only California licensed remediation contractors will be permitted to conduct PCB remediation activities. Prior to the start of work at each facility, a site-specific HASP will be prepared in compliance with applicable Cal/OSHA standards. Personal protective equipment (PPE) will be employed, as detailed in the HASP, and will include disposable coveralls, gloves, boots, eye protection, hard hats, and negative pressure respirators with P100 filters.

4.3.3.2 Site Preparation

Access to the work areas will be controlled using caution tape and signage. Only trained personnel involved in the remediation will be allowed in the work areas.

4.3.3.3 Engineering Controls

As noted above, site-specific Means and Methods Plans will be developed and submitted for USEPA approval prior to initiating remedial activities. The following section outlines general engineering controls that will be employed.

Engineering controls will include polyethylene sheeting to control and catch debris, wetting material prior to handling, and work practices to minimize dust generation. An integral step in implementing protective measures is to assign a containment area for each distinct abatement area. The containment area size and construction will be proportionate to the activities that will be conducted (i.e., amount of dust generation expected). Containment structures will be constructed within the containment area at each location where abatement is performed and in a manner that minimizes airborne dust from spreading outside the abatement area. For example, a containment structure can be constructed of poly sheeting draped over existing building features and/or support frames built specifically for the containment area. The containment area will be maintained under negative air pressure by installing an induced draft fan equipped with HEPA filters to minimize dust particles from being carried out of the containment area. The filtered exhaust from the fan will be routed outside the containment area and vented outside of the building. When significant dust is produced by the abatement activities, dust monitoring outside the containment structures will be conducted. All powered tools will also be equipped with appropriate tool guards and dust/debris collection systems with HEPA filters.

4.3.3.4 Air Monitoring

In order to verify the effectiveness of dust minimization engineering controls, air monitoring for respirable airborne particulates will be conducted using data-logging, real time monitors. The following Cal/OSHA permissible exposure limits (PELs), based on an 8-hour, time-weighted average (8-hour TWA) will be considered applicable to this work:

- Total Dust: 15 milligrams per cubic meter (mg/m^3)
- Respirable Fraction: 5 mg/m^3
- PCBs (42% Chlorine): 1 mg/m^3
- PCBs (54% Chlorine): 0.5 mg/m^3

A total airborne particulate action limit has been established for the PCB remediation work to be conducted at the site with consideration of the specific receptors, PCB concentrations, work activities, and Cal/OSHA permissible exposure limits. The action limit applies only to air monitoring at the perimeter of the work zone; an action limit has not been set for the active work zones (exclusion zones) as engineering controls will be used within these zones.

An action limit of 0.1 mg/m^3 above background will be maintained during site work. Air monitoring at a location representative of background air conditions (i.e. a location upwind of the work area) will be conducted at the same frequency as the monitoring to obtain data representative of real-time background conditions. The action limit will be used to determine if and when additional engineered controls and/or work stoppages would be necessary.

Air monitoring equipment will be calibrated according to manufacturer's specifications. Weather and other site conditions will affect the normal operation of the equipment, which will require routine maintenance. Weather conditions will be noted on daily air monitoring logs. For work conducted on the exterior of buildings, it is expected that dust or other particulate matter will not be a concern on rainy or misty days.

Should the action level be exceeded during remediation, ENVIRON will evaluate work procedures and recommend additional engineering controls or modified work practices to control dust generation. Any recommended changes to work practices will be documented. It is noted that the Cal/OSHA standards are based on an 8-hour TWA. Therefore, instantaneous exceedances of the action level and/or the standards listed above will not necessarily indicate an exceedance of the PEL.

Air monitoring stations will be established at the perimeter of, and within, the designated work area. Air monitoring will be conducted at all times during PCB remediation activities. ENVIRON will review monitoring data a minimum of once per hour during the work. The logged data will be downloaded and reviewed daily, so that changes to the work practices can be recommended based on observable trends in airborne dust concentration.

If monitoring indicates that particulate matter concentrations are not maintained below the action level, remediation activities shall cease until work practices can be evaluated and adjusted.

4.3.4 Proposed Procedures for the Removal and Cleanup of PCB-Containing Materials

4.3.4.1 Caulking and Glazing

The caulking and glazing removal task described below includes the removal and off-site disposal of source materials identified during characterization activities at SMMUSD facilities.

- Surface preparation for caulking and glazing removal will include surficial wetting of visibly dry and/or deteriorating material to minimize dust generation.
- At locations where caulking or glazing will be removed from vertical joints (e.g., between a retaining wall and a building), polyethylene sheeting will be placed on the ground surface and removal will be conducted using hand tools to achieve removal to the maximum extent practicable while minimizing dust or other airborne particulates generated from caulking, glazing, or adjacent materials. This will not include mechanical grinding or saw cutting any concrete or brick in direct contact with the caulking or glazing.
- Upon the completion of the initial removal activities, the joints will be visually inspected for the presence of any residual caulking or glazing. If residual caulking or glazing is observed, it will be removed from the adjacent material to the maximum extent practicable. This may include scraping or chemical means to remove the visible remnants from the concrete or brick.
- Wet wiping and/or vacuuming of all tools and equipment in the work area will be performed at the completion of the work activity.
- During the project, equipment and tools used in the process will be decontaminated through spraying and wet wiping. At the completion of the project, any non-disposable equipment and tools that handled PCB material will be decontaminated following the procedures described in 40 CFR 761.79.
- Any debris collected on the polyethylene sheeting will be gathered and placed in PCB Bulk Product Waste containers at the end of each work day. After use, disposable PPE and poly sheeting used to collect debris will be placed in the appropriate containers for disposal as PCB Remediation Waste.
- All removed caulking, glazing, and associated debris will be transported for off-site disposal as PCB Bulk Product Waste.

4.3.4.2 Paint

The paint removal task described below includes the removal and off-site disposal of source materials identified during characterization activities at SMMUSD facilities.

- Surface preparation for paint removal will include surficial wetting of visibly dry and/or deteriorating material to minimize dust generation.
- At locations where paint will be removed from vertical surface, polyethylene sheeting will be placed on the ground surface and removal will be conducted using hand tools to achieve removal to the maximum extent practicable while minimizing dust or other airborne particulates generated from paint or adjacent materials. Mechanical grinding or saw cutting of surfaces painted with PCB-containing paint may be needed.
- Upon the completion of the initial removal activities, the surfaces will be visually inspected for the presence of any residual paint. If residual paint is observed, it will be removed from the adjacent material to the maximum extent practicable. This may include scraping or chemical means to remove the visible remnants from the surface.

- Wet wiping and/or vacuuming of all tools and equipment in the work area will be performed at the completion of the work activity.
- During the project, equipment and tools used in the process will be decontaminated through spraying and wet wiping. At the completion of the project, any non-disposable equipment and tools that handled PCB material will be decontaminated following the procedures described in 40 CFR 761.79.
- Any debris collected on the polyethylene sheeting will be gathered and placed in PCB Bulk Product Waste containers at the end of each work day. After use, disposable PPE and poly sheeting used to collect debris will be placed in the appropriate containers for disposal as PCB Remediation Waste.
- All removed paint and associated debris will be transported for off-site disposal as PCB Bulk Product Waste.

4.3.4.3 Concrete and Brick

The concrete and brick removal task described below includes the removal and off-site disposal of PCB-impacted materials identified during characterization activities at SMMUSD facilities.

- Surface preparation for concrete and brick removal will include surficial wetting of visibly dry and/or deteriorating material to minimize dust generation.
- Concrete and brick on either side of a joint containing PCB-containing caulk or glaze will be removed to a distance of 12 inches in all directions using a saw. If concrete or brick is less than 12 inches thick, adjacent material will be removed to a depth of 12 inches. This material will be managed as PCB Bulk Product Waste.
- Wet wiping and/or vacuuming of all tools and equipment in the work area will be performed at the completion of the work activity.
- During the project, equipment and tools used in the process will be decontaminated through spraying and wet wiping. At the completion of the project, any non-disposable equipment and tools that handled PCB material will be decontaminated following the procedures described in 40 CFR 761.79.
- All removed materials will be stored on site in lined, marked, and covered roll-off containers prior to off-site disposal.

4.3.4.4 Soils

The soil removal task described below includes the removal and off-site disposal of PCB-impacted soils identified during characterization activities at SMMUSD facilities.

- Prior to any work, the boundaries of the excavation area will be marked and properly secured. The excavation contractor will obtain a permit from Dig Alert.
- Access to the active work areas will be controlled through fencing with controlled access points.
- Water misting will be used as a dust suppressant, as appropriate.

- Air monitoring at the perimeter of the active PCB-impacted soil removal areas will be conducted during active soil removal. To reduce dust levels and exposures to dust, a combination of engineering controls and PPE will be implemented during work activities.
- If the soil is found to be impacted by building materials (i.e. paint, caulk, etc.), the soil will be disposed offsite as PCB Bulk Product Waste.
- All excavated soil will be stored in lined, marked, and covered roll-offs or other approved containers in accordance with 40 CFR 761.40 and 761.65.
- During the project, equipment and tools used in the process will be decontaminated through spraying and wet wiping. At the completion of the project, any non-disposable equipment and tools that handled PCB material will be decontaminated following the procedures described in 40 CFR 761.79. Water generated during decontamination will be containerized, sampled, and disposed of offsite in accordance with 40 CFR 761.79.
- Only those soil areas confirmed to contain PCBs < 1 ppm, or the level that DTSC suggested, will be cleared for use by the general contractor.

It is noted that additional PCB-containing materials such as mastics, sealants, nonporous materials, foam board insulation, gaskets, etc. could be identified in individual buildings. As necessary, the site-specific work plan will address proposed procedures for the removal and cleanup of these materials.

4.3.5 Proposed Procedures for the Decontamination of Nonporous Materials

The task described below includes decontamination of nonporous materials adjacent to PCB-containing materials identified during characterization activities at SMMUSD facilities.

- When possible, all nonporous materials to be decontaminated will be disassembled and transported to a secure decontamination area and staged on polyethylene sheeting. If the material cannot be easily removed, the decontamination area will be lined with polyethylene sheeting in a manner designed to contain all liquids generated from the decontamination process.
- Material will be decontaminated via chemical washing with a chemical extraction solvent following the manufacturer's recommended procedures for hand applications: the product will be applied and scrubbed using hand brushes; during the agitation, the surface of the material will be kept wet with the chemical extraction solvent at all times. Following the five-minute dwell time, all free liquid will be vacuumed from the surface; a layer of rinse water will be applied to the material and then vacuumed; this procedure will be repeated three times followed by a triple water rinse after the final application.
- Surface wipe samples will then be collected in accordance with the standard wipe test as defined in 40 CFR 761.123.

4.3.6 Proposed Procedures for the Use of Encapsulants on Porous Building Materials

Given the limitations of certain structures, extensive building material removal may not be a feasible remedial alternative; therefore, a containment remedial plan would be developed for use in that circumstance.

The first component of the plan is to remove all PCB-containing joint materials by physical means and to containerize materials for off-site disposal as PCB Bulk Product Waste. Following removal, the joint will be visually inspected to ensure that all caulking is removed to the maximum extent practicable.

The second component of the plan involves sand blasting the surfaces in preparation for repainting. This will be accomplished by providing PCB awareness training for the sandblasting workers (workers used respirators and were already entered into a respirator program), totally encapsulating the area with polyethylene sheeting, and collection of all sand blast media and paint residuals with the polyethylene sheeting and managing this material as PCB Bulk Product Waste.

The porous materials in former direct contact with PCB-containing caulking or glazing will be encapsulated with two coats of an epoxy coating, followed by new caulking. The porous materials located within 12 inches of the joint will be covered with two coats of contrasting color of an elastomeric acrylic coating or equivalent product to eliminate the direct exposure pathway and leaching transport pathway from residual PCBs.

The elimination of this exposure pathway mitigates both the potential for PCB transfer via direct contact and the material's potential as a source to other media/materials. A periodic monitoring plan, including surface wipe samples, will be implemented to assess potential PCB concentrations on the exposed outer surfaces.

The following describes the proposed remedial activities for the porous surfaces that will not be removed:

- Prior to application of the protective coating, all surfaces will be prepared so that they are dry, clean, and sound (as described above, the ceiling was sand blasted in preparation for the paint application).
- Two coats of the epoxy will be applied to interior joints, and two coats in contrasting colors of an elastomeric acrylic coating will be directly applied to the porous 12 inches on either side of the joint.
- Baseline bulk samples are not proposed to be collected prior to encapsulation of the adjacent surfaces given the limited amount of material and the existing data.

All generated waste material (PPE, application tools, etc.) will be containerized in an appropriate waste container for subsequent off-site disposal. PPE will be wet wiped and containerized for off-site disposal.

4.3.7 Post-Removal Verification Sampling

Upon removal of PCB-impacted media, verification sampling of the underlying building materials and/or soils beyond the extent of removal will be conducted. The post-removal sampling scope of work will be presented in the site-specific PCB Remediation Work Plan, described above.

Analytical results from the verification samples will be evaluated to determine whether or not this task is complete as follows:

4.3.7.1 Porous Building Materials (e.g. wood, concrete, brick, etc.)

- Analytical results ≤ 1 ppm – task complete; no additional cleanup required and/or no disposal restrictions will apply to the underlying or adjacent materials.
- Analytical results > 1 ppm – additional removal and off-site disposal as < 50 ppm PCB Remediation Waste (assuming the data indicate the materials are < 50 ppm) will be conducted and the sampling process will be repeated until the levels are met.

4.3.7.2 Soil

- Analytical results < 1 ppm – task complete; no additional cleanup required.
- Analytical results ≥ 1 ppm – additional removal and off-site disposal as < 50 ppm PCB Remediation Waste (assuming the data is < 50 ppm) will be conducted and sampling process repeated until the levels are met.

4.3.7.3 Nonporous Building Materials

For nonporous surfaces that are decontaminated, surface wipe samples will be collected in accordance with the standard wipe test (40 CFR 761.123) from locations on the material formerly in contact with the PCB impacted waste. If results indicate that the PCB concentration is less than the cleanup level (10 µg/100cm^2), then no additional cleanup is required. If a verification sample is reported with PCB concentrations above 10 µg/100 cm^2, this surface will be cleaned again. All samples will be extracted using USEPA Method 3540C (Soxhlet Extraction) and analyzed for PCBs using USEPA Method 8082.

4.3.7.4 Encapsulated Porous Surfaces

For porous surfaces that are encapsulated, baseline verification wipe samples of the encapsulated surface will be collected from random locations. If analytical results indicate PCB concentration less than 10 µg/100 cm^2, this area will transition into a maintenance and monitoring program. If analytical results indicate PCB concentrations greater than 10 µg/100 cm^2, an additional application of the coating and additional testing may be required.

4.3.8 Data Validation

A data quality and data usability assessment of all samples will be completed. The data review will be conducted by ENVIRON in accordance with USEPA protocols. This review will include a completeness check of field documentation including sample collection and preservation methods, a completeness check of the laboratory data and documentation, a review of the internal laboratory QA/QC procedures and results including surrogate recoveries, MS/MSD results, blank results, and laboratory control standard results, and an evaluation of sample

holding times, and field duplicate results. Upon receiving the data validation summaries, any qualifiers applied to the data will be added to the data summary tables presented in the final report.

4.3.9 PCB Waste Management and Disposal

The off-site disposal includes handling, storing, containerizing, transporting (including providing and preparing manifests, bills of lading, etc.) and disposing of PCB waste streams. The PCB waste streams will be transported via a licensed waste hauler to a permitted chemical waste disposal facility as outlined below.

Secure, lined, and covered waste containers (roll-off containers or equivalent) or 55-gallon U.S. Department of Transportation (DOT)-approved steel containers will be staged for the collection of PCB wastes generated during the work activities in accordance with 40 CFR 761.65. All containers will be properly labeled and marked in accordance with 40 CFR 761.40.

Upon completion of waste profiling and acceptance to the respective facilities, PCB wastes will be loaded into transportation vehicles for shipment to the disposal facility.

- PCB Bulk Product Waste will be segregated for disposal and transported under a manifest and/or bill of lading to a disposal facility in accordance with 40 CFR 761.62.
- ≥50 ppm PCB Remediation Waste will be segregated for disposal and transported under a hazardous waste manifest to a hazardous waste landfill in accordance with 40 CFR 761.61.
- <50 ppm PCB Remediation Waste (e.g. soil, concrete, brick, etc.) containing ≥1 ppm and < 50 ppm PCBs will be segregated for disposal and transported under a manifest and/or bill of lading to a disposal facility.
- Excluded PCB Product (e.g. caulk, paint, mastic and sealants) containing < 50 ppm PCBs will be segregated for disposal and transported under a manifest and/or bill of lading to a disposal facility.
- Soils and building materials with PCB concentrations $\leq$ 1 ppm will be managed without PCB restrictions (e.g., reused on site or recycled/disposed off site).

Water generated during decontamination (or as part of dust suppression) that is collected on polyethylene sheeting will be containerized on site, sampled, and designated for off-site disposal in accordance with 40 CFR 761.79. Polyethylene sheeting, PPE, and non-liquid cleaning materials will be managed and disposed of offsite in accordance with 40 CFR 761.61(A)(5)(v).

4.3.10 Post-Remediation Reports

Following completion of the work activities, records and documents per 40 CFR 761 will be generated and maintained at one location. A post-remediation report will be prepared which will contain a detailed description of remediation activities, post cleanup samples, appropriate figures and drawings, and analytical data tables presenting results of post cleanup samples. In addition, the report will include volumes of disposed materials, and all waste disposal records. The post-remediation report will be prepared to provide a full accounting of all activities

performed and documentation necessary to support the conclusion that the remedial activities met the objectives of the project. The report will be submitted to EPA Region IX for review and ultimate approval.

The final post-remediation report will also be available to the public upon request.

5 Quality Assurance and Quality Control

ENVIRON maintains a high standard of quality control/quality assurance (QA/QC) for all of its work products. To further this, ENVIRON maintains records of QA/QC and conducts internal reviews by senior reviewers. The QA/QC procedures will enhance the quality and consistency of the work products while meeting the changing needs of the project. This Section describes QA/QC procedures for the three parts of the Comprehensive Plan included in Sections 2 through 4 that ENVIRON will or other District contractors should follow.

5.1 Field Activities

- The ENVIRON field personnel will document the field activities to (1) provide a record of procedures performed in the field; (2) record key events during field operations; (3) identify samples and track status in the field and during transfer to the laboratory; and (4) facilitate chain-of-custody and accountability procedures by providing legible, concise information.
- The investigations will be conducted in a systematic way. The list of rooms in each building will be generated prior to the field investigation. A checklist will be developed to include all the potential PCB building materials known to be present at a school site.
- Samples will be collected following the appropriate USEPA methods.
  - For air sampling, pumps will be calibrated pre and post the sampling on the day of sampling. The measured flow rates should be documented for each individual pumps.
  - Sampling devices should be cleaned prior to sampling to minimize cross contamination. New sampling supplies, such as tubing, wipe sampling templates, should be used for each individual sample.
  - Samples will be labeled in a consistent manner to allow identification of the sampling location and type of sample.
  - Quality control samples, including field blanks, field duplicates, and equipment blanks will be collected and labeled with appropriate qualifiers, such as using FD for field duplicate. Field blanks and duplicates will be collected at a frequency of 10%, or a minimum of one per sampling event, respectively. When collecting soil or bulk samples, equipment rinseate blanks will be collected at a frequency of one per day for each day that sampling is conducted using non-dedicated sampling equipment, whenever there is change in equipment used, and when field personnel change.
  - Chain-of-custody procedures will be implemented for all samples collected per the sampling plan. Samples will be clearly labeled immediately after collection, and each sample will be assigned a unique identification number. Chain-of-custody forms will be filled out in the field immediately after the sample has been collected and labeled. Chain-of-custody forms will remain with the samples until such are delivered to the laboratory.

5.2 Data Generation and Management

5.2.1 Data Review

The Project Manager or appropriate Task Leader assigned by the Project Manager will review the laboratory data. If comparison of data to previous measurements or known conditions at the Site indicates anomalies, the laboratory will be instructed to review the submitted data while the methods used to collect and handle the samples are reviewed. If anomalies remain, the laboratory may be asked to re-analyze selected samples; other possible corrective actions are discussed below.

5.2.2 Corrective Actions

Corrective actions may be initiated if the precision or accuracy goals are not achieved. The initial step in corrective action will be to instruct the analytical laboratory to examine its procedures to assess whether analytical or computational errors caused the anomalous results. At the same time, sample collection and handling procedures will be reviewed to assess whether they could have contributed to the anomalous results. Based on this evaluation, the Project Manager will evaluate the detection limits used, the sample collection procedures, the analytical parameters, sample custody and sample documentation, and will assess whether re-analysis or resampling is required or whether any protocol should be modified for future sampling events. Any changes in laboratory methods or quality assurance parameters or limits require written approval prior to implementation by the laboratory.

5.2.3 Data Management

Analytical data will be provided to ENVIRON by the laboratory via email in both Microsoft Excel and Adobe PDF file types. The electronic data will be entered and maintained in the electronic project database. Analytical results in the two file types will be checked for consistence.

Any data tabulation or analysis will be checked by a reviewer at ENVIRON. The author will make sure that the reviewer has a clear understanding of the QC task. The peer reviewer will provide the feedback to the author and follow through the process (i.e. until all the errors are corrected and suggested modifications are incorporated.) A QC log may be utilized to facilitate the process by documenting the QC results and author's actions.

5.3 Document Review

- Report (or document) preparation and finalization will follow the steps provided below:
  - Preparing the draft report/document
  - Senior level review of the draft by the Project Manager and/or other ENVIRON experts on the subject matter
  - Principal level review of the draft by the Principal-in-Charge
  - Soliciting comments from the SMMUSD, governmental agencies (e.g., EPA and DTSC), and the community (if appropriate)
  - Revising the draft report/document (there may be multiple revisions depending on the comments)

  - Finalizing the report/document

- All the internal review of reports will be accompanied with a sign-off sheet (see Appendix D).
- The versions of the report will be controlled by assigning proper version numbers.

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USEPA. 2014b. March. *PCBs in Schools.* Presented at Southern California Clean, Green & Healthy Schools Partnership Meeting, March 25, 2014.

Appendix A

Community Survey Questionnaire

Department of Toxic Substances Control

Matthew Rodriquez
Secretary for
Environmental Protection

Deborah O. Raphael, Director
9211 Oakdale Avenue
Chatsworth, California 91311

Edmund G. Brown Jr.
Governor

April 4, 2014

**Community Survey Regarding the Environmental Investigation,
Malibu High School, Malibu, CA**

Dear Community Member:

The Department of Toxic Substances Control (DTSC) and the U.S. Environmental Protection Agency (USEPA), encourage you to complete and return the enclosed community survey. Your response to this survey will help us learn more about your community, plan future outreach activities and keep you informed regarding the environmental investigation at Malibu High School, Middle School, and the adjacent Juan Cabrillo Elementary School (Site).

Previous Investigation Overview
Between 2009 and 2011, the Santa Monica-Malibu Unified School District (SMMUSD) conducted an environmental investigation and cleanup of soil contaminated with pesticides and polychlorinated biphenyls (PCBs). In 2012, the Removal Action Cleanup Report, documented the removal of the contaminated soil and reported the existing Site property did not pose a risk to human health or the environment. However, DTSC did not provide regulatory oversight for the environmental actions at the Site since the District did not use State funds for the investigation or the cleanup.

Current Status and Next Steps
In March 2014, DTSC and the SMMUSD executed a Voluntary Investigation Agreement to evaluate environmental conditions at the middle/high school and the adjoining elementary school. DTSC will assume regulatory oversight of the soil investigation. USEPA will oversee the PCB investigation related to building material (caulking). However, DTSC and USEPA will work together to coordinate all future investigation efforts.

Please take the time to fill out and return the attached community survey to DTSC by **April 18, 2014.** The survey can be returned via:

E-mail: marina.perez@dtsc.ca.gov;
Fax: (818) 717-6575; or
US Mail: Marina Perez, DTSC Public Participation Specialist,
9211 Oakdale Avenue
Chatsworth, CA 91311

For questions about the environmental investigation or the enclosed survey, please call me at (818) 717-6569, or e-mail me at marina.perez@dtsc.ca.gov

Sincerely,

Marina E. Pérez
Public Participation Specialist

Department of Toxic Substances Control

Deborah O. Raphael, Director
9211 Oakdale Avenue
Chatsworth, California 91311

Matthew Rodriquez
Secretary for
Environmental Protection

Edmund G. Brown Jr.
Governor

4 de abril de 2014

Encuesta Comunitaria Sobre La Investigación Ambiental
Malibu High School, Malibu, CA

Estimado Miembro Comunitario:

El Departamento del Control de Sustancias Tóxicas (DTSC, por sus siglas en inglés) y la Agencia de Protección Ambiental Estadounidense (USEPA, por sus siglas en inglés), anima a completar y devolver la encuesta comunitaria. Su respuesta a esta encuesta nos ayudará a aprender más sobre su comunidad, planear actividades de alcance, y manteneros informados sobre la investigación del medio ambiente en Malibu High School, Middle School y adyacentes Juan Cabrillo Elementary School (Sitio).

Resumen de Previa Investigación
Entre 2009 y 2011, el Distrito Escolar Unificado Santa Mónica - Malibu (SMMUSD, por sus siglas en inglés) realizó una investigación del medio ambiente y la limpieza de suelos contaminados con pesticidas y bifenilos policlorados (PCBs, por sus siglas en inglés). En 2012, el Informe de Limpieza de Acción de Eliminación, documentó la remoción de la tierra contaminada y que la propiedad existente del sitio no representaba un riesgo para la salud humana o el medio ambiente. Sin embargo, como SMMUSD no utilizó fondos públicos para la investigación o la limpieza, DTSC no proporcionó supervisión reglamentaria para las acciones ambientales en el sitio.

Estado Actual y Próximos Pasos
En marzo de 2014, DTSC y SMMUSD ejecutan un Acuerdo Voluntario de Investigación para evaluar las condiciones ambientales en la intermedia/secundaria y la escuela primaria contigua. DTSC asumirá la supervisión regulatoria de la investigación del suelo. USEPA se encargará de supervisar la investigación de PCBs relacionada a la construcción de material (masilla). Sin embargo, DTSC y USEPA trabajarán juntos para coordinar todos los esfuerzos de la investigación futura.

Por favor, tómese el tiempo para llenar y devolver la encuesta sobre la comunidad adjunta a DTSC no más tarde del **18 de abril de 2014**.

La encuesta puede ser devuelto por:

Correo electrónico:	marina.perez@dtsc.ca.gov;
Fax:	(818) 717-6575;
Correo:	Marina Pérez, Especialista de Participación Pública, DTSC, 9211 Oakdale Avenue, Chatsworth, CA 91311

Preguntas sobre la investigación del medio ambiente o la encuesta adjunta, por favor llámeme al (818) 717-6569, o correo electrónico a marina.perez@dtsc.ca.gov.

Atentamente,
Marina E. Pérez,
Especialista de Participación Pública

Department of Toxic Substances Control

April 2014

Community Survey

The mission of DTSC is to protect California's people and environment from harmful effects of toxic substances through the restoration of contaminated resources, enforcement, regulation and pollution prevention.

Malibu High School,
30215 Morning View, Malibu, California 90265

1. **What is your relationship to Malibu High School, Malibu Middle School, and/or Juan Cabrillo Elementary School?**
   Parent of Student at: ☐ Malibu High School ☐ Malibu Middle School ☐ Juan Cabrillo Elementary School
   Teacher/Employee at: ☐ Malibu High School ☐ Malibu Middle School ☐ Juan Cabrillo Elementary School
   Other (please specify): _____

2. **What is your interest level in this Site?**
   ☐ **High –** I am very interested. I would read information mailed to me and speak with others about this Site.
   ☐ **Moderate** – Some interest. I am interested in hearing or reading more about this Site.
   ☐ **Low –** Unsure if I am interested or not.
   ☐ **None –** No interest. I do not want information about this Site.

3. **Do you have any specific concerns about this Site?**
   ☐ Yes ☐ No
   If yes, please describe:

   _____
   _____
   _____
   _____

4. **We want to tell you more about this Site. What is the best way to provide you information?**
   ☐ E-Mail Only
   ☐ Santa Monica-Malibu Unified School District (SMMUSD)Website
   ☐ Department of Toxic Substances Control (DTSC) Website
   ☐ Social Media – Facebook, Twitter, etc.
   ☐ Community Workshops
   ☐ Newspaper – What newspaper(s) do you read? _____
   ☐ US Postal Mail – Printed material and/or letters.

5. **If you would like to receive information about the Site, please complete the information below.**
   Choose the box below to show if you want to be added, removed, or just update your current information.

   ☐ **Add** me to Mailing List ☐ Update my information ☐ Remove me for the Mailing List

   Name: _____

   Mailing Address: _____

   Phone Number: _____ E-mail address: _____

➔ ➔ ➔ ***Please continue on the backside*** ➔ ➔ ➔

Cal/EPA DTSC State of California

6. **Tell us if you are willing to attend a community workshop about this Site.**

☐ Yes, I would like to participate in a community workshop. ☐ No, I would not attend a community workshop.

7. **When is the best time for you to attend a community workshop?**

☐ Weekday (9am-5pm) ☐ Weeknights (5pm or later) ☐ Weekends

8. **What language would you prefer to receive information about the Site, please complete the information below.**

☐ English ☐ Spanish ☐ Other: _____

9. **Is there an active community group or individual(s) in your neighborhood that we should add to our mailing list?** Please provide us with the following information:

Name: _____
Mailing Address: _____
Phone Number: _____ and/or E-mail: _____

10. **We often conduct interviews with community members to learn more about the Site and to identify better ways to communicate. Would you be willing to speak with us?**

☐ Yes, I would like to participate. ☐ No, I would not like to participate.

If yes, please provide your name and phone number/E-mail: _____

11. **Are you familiar with the USEPA's "PCBs in Caulk Fact Sheet"?** ☐ **Yes** ☐ **No**

12. **Are you familiar with the "Best Management Practices" recommended by the USEPA?** ☐ Yes ☐ No
If "yes", do you have any recommendations for additional Best Management Practices? _____
_____
_____

13. **How often do you think Best Management Practices should be implemented?** _____
_____
_____

14. **Do you have any specific questions about the indoor air investigation or Best Management Practices at these schools? If so, please describe.** _____
_____
_____

More information about this Site can be found at DTSC's:
http://www.envirostor.dtsc.ca.gov/public/profile_report.asp?global_id=19820092

Completed surveys should be sent to:

Marina Perez, DTSC, Public Participation Specialist
9211 Oakdale Ave., Chatsworth, CA 91211
E-mail: marina.perez@dtsc.ca.gov, Fax: (818) 717-6575
Surveys must be postmarked by APRIL 18, 2014

Note: Survey responses received by the DTSC are public record and may be released to the public if requested.

Encuesta Comunitaria

La mision del DTSC es de proteger a los residentes de California y al medio ambiente de los efectos nocivos de substancias toxicas atravez de la restauracion de recursos contaminados, la aplicacion de regulaciones, y la prevencion de la contaminacion.

Malibu High School
30215 Morning View, Malibu, CA 90265

1. **¿Qué es su relación a Malibu High School, Malibu Middle School, y/o Juan Cabrillo Elementary School?**
   Padre de Alumno en: ☐ Malibu High School ☐ Malibu Middle School ☐ Juan Cabrillo Elementary School
   Maestro(a)/Personal de: ☐ Malibu High School ☐ Malibu Middle School ☐ Juan Cabrillo Elementary School
   Otro (Favor de explicar): _____

2. **¿Cuál es su nivel de interés en este Sitio?**
   ☐ **Alto** – Me interesa mucho. Me interesa leer información y platicar con otros sobre el Sitio.
   ☐ **Moderado** – Un poco de interés. Me interesa oír o leer más sobre el Sitio.
   ☐ **Bajo** – No estoy seguro si estoy interesado.
   ☐ **Ninguno** – Ningún interés. No quiero recibir información sobre este Sitio.

3. **Tiene usted alguna preocupación específica sobre este Sitio?**
   ☐ Sí ☐ No

   Si su respuesta es Sí, por favor descríbala:

   _____
   _____
   _____
   _____

4. **Queremos proveerle más información sobre este Sitio. ¿Cuál es la mejor manera de darle la información?**
   ☐ Solamente por Correo Electrónico (E-mail)
   ☐ Página web de Santa Monica-Malibu Unified School District (SMMUSD)Website
   ☐ Página web de Department of Toxic Substances Control (DTSC)
   ☐ Por medio de la red – Facebook, Twitter, etc.
   ☐ Talleres Comunitarios
   ☐ Periódico - ¿Qué periódico(s) le usted? _____
   ☐ Correo Postal – Por medio de material y/o cartas enviadas

5. **¿Le gustaría que agregáramos su nombre a nuestra lista de correos sobre esté Sitio?**
   Favor de indicar si quiere que le agreguen, que revisen, o que elimine su nombre de la lista de correos.
   ☐ **Agréguemе a la lista** ☐ **Revise** mi información en la lista. ☐ **Quite** mi información de la lista

Nombre: _____

Domicilio: _____

Ciudad, Estado, Código Postal: _____

Teléfono: _____ **Correo Electrónico:** _____

(→→→Continúa al reverso de esta página →→→)

6. **¿Le interesa asistir talleres comunitarios sobre este Sitio?**

☐ Sí, me interesa asistir un taller comunitario ☐ No, me interesa asistir un taller comunitario.

7. **¿Cuál es la mejor hora para asistir un taller comunitario?**

☐ Día (9am-5pm) ☐ Tarde (5pm o más tarde) ☐ Fin de Semana

8. **¿En qué idioma le gustaría recibir información sobre este Sitio?**

☐ Ingles ☐ Español ☐ Otra idioma: _____

9. **¿Sabe usted de un grupo comunitario o individuo de la zona donde usted vive que debemos agregar a nuestra lista de correos?**
Favor de proveer esta información:
Nombre: _____
Domicilio: _____
Teléfono: _____ y/o Correo Electrónico: _____

10. **A veces hablamos con el público para familiarizarnos con la comunidad. ¿Le interesa hablar con nosotros?**
☐ Sí, me interesa hablar con ustedes.
Nombre, número de teléfono/correo electrónico: _____

☐ No, me interesa hablar con ustedes.

11. **¿Está familiarizado con la hoja de datos, PCB en masilla del USEPA?** ☐ **Sí** ☐ **No**

12. **¿Está familiarizado con "Mejores Maneras o Prácticas" referente a la exposición a PCBs recomendado por el USEPA?** ☐ Sí ☐ No
Si indico "Sí", ¿Tiene usted recomendaciones para añadir las formas de disminuir la exposición a PCBs?
_____
_____

13. **¿En qué frecuencia cree usted que se debe implementar las Mejores Maneras o Prácticas?**
_____
_____

14. **¿Tiene preguntas específicas relacionadas a la investigación del aire interior Mejores Prácticas en estas escuelas? Favor de describir:** _____

Puede encontrar más información sobre este Sitio en la página web del DTSC:
http://www.envirostor.dtsc.ca.gov/public/profile_report.asp?global_id=19820092

Envié su encuesta completa a: **Marina Pérez, DTSC, Public Participation Specialist**
9211 Oakdale Ave., Chatsworth, CA 91211
Correo Electronico: marina.perez@dtsc.ca.gov,
Fax: (818) 717-6575
Entregué su encuesta no más tarde del 18 de abril de 2014

Note: Las Respuestas a encuestas recibidas por el DTSC son documentos de interés público y pueden ser entregadas al público si así lo requieren.

Appendix B

PCB-Containing Materials

Appendix B

A list of building materials that have been reported to contain PCBs is provided in Table B-1 below (USEPA, 2012a). The building materials were grouped according to whether or not they were likely to have been manufactured with PCBs (i.e., primary source materials) or if they absorbed PCBs due to their proximity to primary sources (i.e., secondary source materials). Porous materials, such as concrete and brick, can absorb PCBs when adjacent to caulk or other materials manufactured with elevated concentrations of PCBs.

Table B-1: Primary and Secondary PCB Source Materials

Primary Source Material	Secondary Source Material
• Caulking (sealant, plaster, glazing) • Lighting ballast • Transformer dielectric fluid • Adhesives/mastic • Surface coating (e.g., spray on fireproofing material) • Paint • Ceiling tiles • Electric wiring	• Insulation materials • Backer rod • Gaskets • Cove base • Polyurethane foam (furniture) • Wood • Brick/mortar/cinder block • Asphalt • Stone (granite, limestone, marble, etc.) • Concrete

Appendix C

USEPA Region I Standard Operating Procedure for Sampling Porous Surfaces for Polychlorinated Biphenyls

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region 1
5 Post Office Square, Suite 100
Boston, MA 02109-3912

STANDARD OPERATING PROCEDURE FOR SAMPLING POROUS SURFACES FOR POLYCHLORINATED BIPHENYLS (PCBs)

May 2011

STANDARD OPERATING PROCEDURE FOR SAMPLING POROUS SURFACES FOR POLYCHLORINATED BIPHENYLS (PCBs)

The Office of Environmental Measurement and Evaluation
EPA New England – Region 1
11 Technology Dr.
North Chelmsford, MA 01863

Prepared by: Dan Granz, Environmental Engineer — Date: 5/5/11

Reviewed by: Kim Tisa, TSCA PCB Coordinator — Date: 5/5/11

Reviewed by: Jerry Keefe – EIA Team Leader — Date: 05/23/11

Approved by: Dan Boudreau, EIA Chemistry Team Leader — Date: 5/23/11

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Revision Page

Date	Rev#	Summary of Changes	Sections
12/97	1	Initial Approval, draft	
3/20/08	2	Major update, only for PCBs, added TSCA sampling	All sections
7/17/08	3	Disposal of dust filter and decon of vac hose	11.0 and 14.0
5/04/11	4	Vacuum Trap Design and Clean-out	9.4

Table of Contents

1.0 Scope and Application

1.1 This Standard Operating Procedure (SOP) is suitable for collection of a porous matrix sample for analysis of Polychlorinated Biphenyls (PCBs).

1.2 This SOP describes sampling techniques for both hard and soft porous surfaces.

1.2.1 Hard surfaces, and most soft surfaces, can be sampled using an impact hammer drill to generate a uniform, finely ground, powder to be extracted and analyzed for PCBs. This procedure is primarily geared at providing enough sample quantity for two analyses. Hard porous surfaces include concrete, brick, asphalt, cement, sandstone, limestone, unglazed ceramics, and other possible PCB suspected material. This procedure may also be used on other softer porous surfaces, such as wood.

1.2.2 Soft surfaces can be sampled using a chisel or sharp knife to generate a representative sample to be extracted and analyzed for PCBs. Soft porous surfaces include wood, wall plasterboard, low density plastics, rubber, caulking, and other PCB suspected material.

1.3 This SOP provides for collection of surface samples (0 – 0.5 inches) and delineation of PCB contamination throughout the core of the porous surface. The procedure can be used to sample the porous surface at distinctly different depth zones.

2.0 Method Summary

A one-inch or other sized diameter carbide drill bit is used in a rotary impact hammer drill to generate a fine powder, or other representative sample, suitable for extraction and analysis of PCBs from porous surfaces. This method also allows the use of chisels or knives for the collection of samples from soft porous surfaces for PCB analysis.

3.0 Definitions

3.1 Field/Bottle Blank: A sample container of the same lot as the containers used for the environmental samples. This evaluates PCB contamination introduced from the sample container(s) from a common lot.

3.2 Equipment/Rinse/Rinsate Blanks: A sample that is collected by pouring hexane over the sample collection equipment after decontamination and before sample collection. The sample is collected in the appropriate sample container identical to the sample containers. This represents background contamination resulting from the field equipment, sampling procedure, sample container, and shipment.

3.3 Field Replicates/Duplicates: Two or more samples collected at the same sampling location. Field replicates should be samples collected side by side. Field replicates represent the precision of the whole method, site heterogeneity, field sampling, and the laboratory analysis.

3.4 Field Split Samples: Two or more representative subsamples taken from one environmental sample in the field. Prior to splitting, the environmental sample is homogenized to correct for sample heterogeneity that would adversely impact data comparability. Field split samples are usually analyzed by different laboratories (interlaboratory comparison) or by the same laboratory (intralaboratory comparison). Field splits are used to assess sample handling procedures from field to laboratory and laboratory comparability.

3.5 Laboratory Quality Samples: Additional samples that will be collected for the laboratory's quality control program: matrix spike, matrix spike duplicate, laboratory duplicates, etc.

3.6 Proficiency Testing (PT)/Performance Evaluation (PE) Sample: A sample, the composition of which is unknown to the laboratory or analyst, provided to the analyst or laboratory to assess the capability to produce results within acceptable criteria. This is optional depending on the data quality objectives. If possible, it is recommended that the PE sample be of similar matrix as the porous surface(s) being sampled.

3.7 Porous Surface: Any surface that allows PCBs to penetrate or pass into itself including, but not limited to, paint or coating on metal; corroded metal; fibrous glass or glass wool; unglazed ceramics; ceramics with porous glaze; porous building stone such as sandstone, travertine, limestone, or coral rock; low density plastics such as Styrofoam and low density polyethylene; coated (varnished or painted) or uncoated wood; painted or unpainted concrete or cement; plaster; plasterboard; wallboard; rubber; caulking; fiberboard; chipboard; asphalt; or tar paper.

3.8 Shipping Container Temperature Blank: A water sample that is transported to the laboratory to measure the temperature of the samples in the cooler.

4.0 Health and Safety

4.1 Eye, respiratory, and hearing protection are required at all times during sample drilling. A properly fitted respirator is required for hard porous surface sampling. A respirator is recommended whenever there is a risk of inhalation of either particulate or volatilized PCBs during sampling.

4.2 All proper personal protection clothing and equipment must be worn.

4.3 When working with potentially hazardous materials or situations, follow EPA, OSHA, and specific health or safety procedures.

4.4 Care must be exercised when using an electrical drill and sharp cutting objects.

5.0 Interferences and Potential Problems

5.1 This sampling technique produces a finely ground uniform powder, which minimizes the physical matrix effects from variations in the sample consistency (i.e., particle size, uniformity, homogeneity, and surface condition). Matrix spike analysis of a sample is highly recommended to monitor for any matrix related interferences.

5.2 Nitrile gloves are recommended. Latex gloves must not be used due to possible phthalate contamination.

5.3 Interferences may result from using contaminated equipment, solvents, reagents, sample containers, or sampling in a disturbed area. The drill bit must be decontaminated between samples. (see Section 11.0.)

5.4 Cross contamination problems can be eliminated or minimized through the use of dedicated sampling equipment.

6.0 Personnel Qualifications

6.1 All field samplers working at hazardous materials/waste sites are required to take a 40 hour health and safety training course prior to engaging in any field activities. Subsequently, an 8 hour refresher health and safety course is required annually.

6.2 The field sampler should be trained by an experienced sampler before initiating this procedure.

6.3 All personnel shall be responsible for complying with all quality assurance/quality control requirements that pertain to their organizational/technical function.

7.0 Equipment and Supplies

7.1 This list varies with the matrix and if depth profiling is required

Rotary impact hammer variable speed drill
1-inch or other suitable (1/2, 3/4, etc.) diameter carbide tip drill bits
Steel chisel or sharp cutting knife, and hammer
Brush and cloths to clean area
Stainless steel scoopulas

Aluminum foil to collect the powder sample
1 quart Cubitainer with the top cut out to collect the powder sample
Aluminum weighing pans to collect the powder sample
Cleaned glass container (2 oz or 40 mL) with Teflon lined cap
Decontamination supplies: hexane, two small buckets, a scrub brush, detergent, deionized water, hexane squirt bottle, and paper towels
Dedicated vacuum cleaner with a disposable filter or a vacuum pump with a dust filter
Polyethylene tubing and Pasteur pipettes
Sample tags/labels, custody seals, and Chain-of-Custody form

8.0 Sampling Design

8.1 A sufficient number of samples must be collected to meet the data quality objectives of the project. If the source of the PCB contamination is regulated under the federal TSCA PCB Regulations at 40 CFR Part 761, the sampler should insure that the sampling design is sufficient to meet any investigation or verification sampling requirements. At a minimum, the following is recommended:

8.1.1 Suspected stained area (s) should be sampled.

8.1.2 At each separate location, collect at least 3 samples of each type of porous surface, regardless of the amount of each type of porous surface present.

8.1.3 In areas where PCB equipment was used or where PCBs were stored, samples should be collected at a frequency of 1 sample/100 square feet (ft^2).

9.0 Sample Collection

9.1 Hard Porous Surfaces

9.1.1 Lock a 1-inch or another size diameter carbide drill bit into the impact hammer drill and plug the drill into an appropriate power source. For easy identification, sample locations may be pre-marked using a marker or paint. (Note: the actual drilling point must not be marked.) Remove any debris with a clean brush or cloth prior to drilling. All sampling decisions of this nature should be noted in the sampling logbook.

9.1.2 Use a Cubitainer with the top cut off or aluminum foil to contain the powdered sample. Begin drilling in the designated location. Apply steady even pressure and let the drill do the work. Applying too much pressure will generate excessive heat and dull the drill bit prematurely. The drill will provide a finely ground powder that can be easily collected.

9.1.3 Samples should be collected at ½-inch depth intervals. Thus, the initial surface sample should be collected from 0 – 0.5 inches. A ½-inch deep hole generates about 10 grams (20 mL) of powder. Multiple holes located closely adjacent to each other, may be needed to generate sufficient sample volumes for a PCB determination. It is strongly recommended that the analytical laboratory be consulted on the minimum sample size needed for PCB extraction and analysis.

9.1.4 Wall and Ceiling Sampling: A team of two samplers will be required for wall and ceiling sampling. The second person will hold a clean catch surface (e.g. an aluminum pan) below the drill to collect the falling powder. Alternatively, use the chuck-end of the drill bit and punch a hole through the center of the collection pan. The drill bit is then mounted through the pan and into the drill. For ceilings, the drill may be held at an angle to collect the powder. Thus the driller can be drilling at an angle while the assistant steadies the pan to catch the falling powder. As a precaution, it may be advantageous to tape a piece of plastic around the drill, just below the chuck, to avoid dust contaminating the body of the drill and entering the drill's cooling vents. Caution must be taken to prevent obstruction of the drill's cooling vents.

9.2 Soft Porous Surfaces

9.2.1 The procedure for the hard porous surface may be used for certain soft porous surfaces, such as wood.

9.2.2 Samples should be collected at no more than ½-inch depth intervals using a metal chisel or sharp cutting knife. Thus, the initial surface sample should be collected from 0 – 0.5 inches. It is important to collect at least 10 grams for analysis.

9.2.3 For soft porous surfaces, such as caulking and rubber, a representative sample can be collected using a metal chisel or sharp cutting knife.

9.3 Multiple Depth Sampling

9.3.1 Multiple Depth Sampling may not be applicable to certain porous surfaces, such as caulking.

9.3.2 Collect the surface sample as outlined in Section 9.1 or 9.2.

9.3.3 Use the vacuum pump or cleaner to clean out the hole.

9.3.4 To collect multiple depths there are two options.

9.3.4.1 Option one: drill sequentially ½-inch increments with the 1 inch drill.

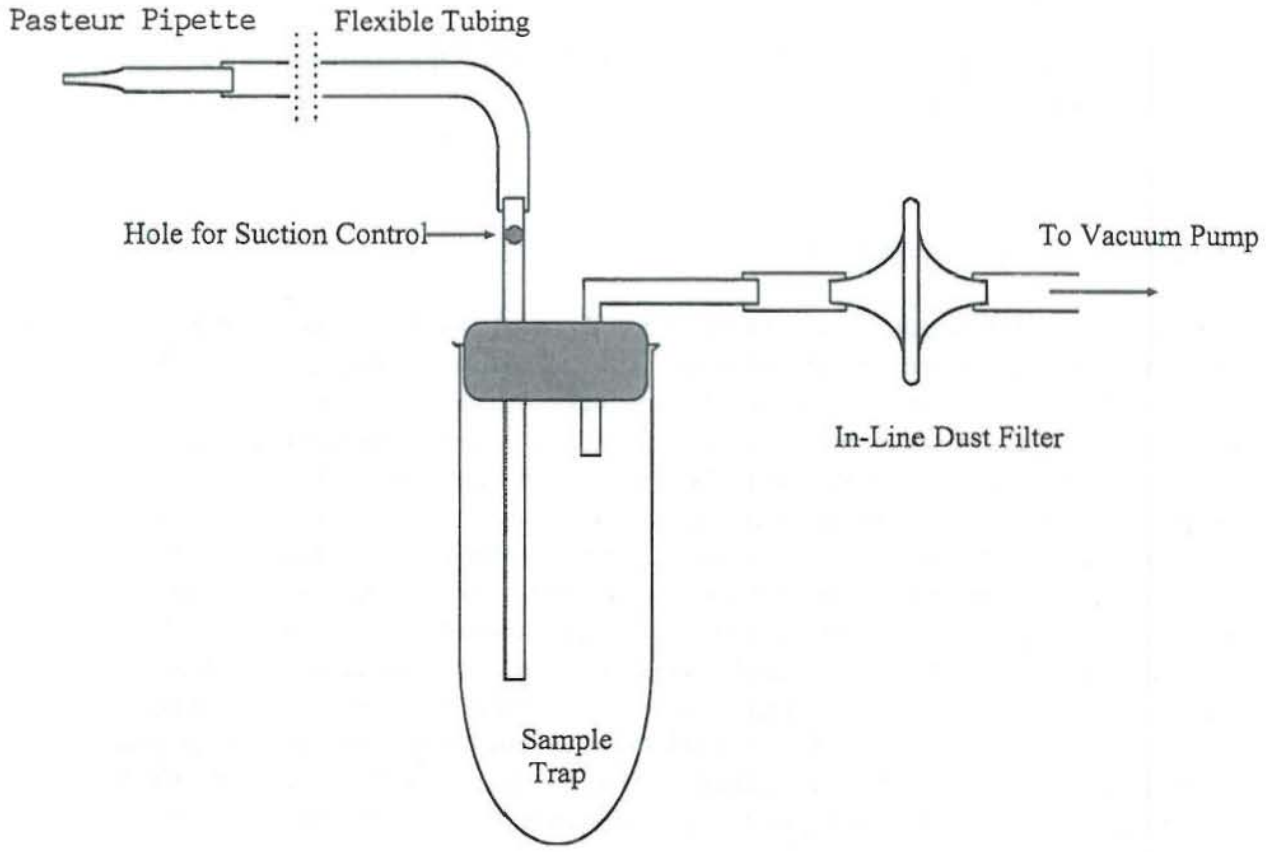
9.3.4.2 Option two: drill with the 1 inch bit and either make the hole larger or use a smaller bit to take the next ½- inch sample.

9.3.5 A stainless steel scoopula will make it easier to collect the sample from the bottom of the hole.

9.4 Vacuum Trap Design and Clean-out

The trap presented in Figure 1 is a convenient and thorough way for collecting and removing concrete powder from drilled holes. The trap system is designed to allow for control of the suction from the vacuum pump and easy trap clean-out between samples. Note, by placing a hole in the inlet tube (see Figure 1), a finger on the hand holding the trap can be used to control the suction at the sampling tip. Thus, when this hole is left completely open, there will be no suction, and the sampler can have complete control over where and what to sample. To change-out between samples the following steps should be taken: 1) the Pasteur pipette and piece of polyethylene tubing at the sample inlet should be replaced with new materials, 2) the portion of the rubber stopper and glass tubing that was in the trap should be wiped down with a clean damp paper towel (wetted with deionized water) and then dried with a fresh paper towel, 3) a clean pipe cleaner should be drawn through the glass inlet tube to remove any concrete dust present, and 4) the glass tube or flask used to collect the sample should swapped out with a clean decontaminated sample trap. Having several clean tubes or flasks on hand will facilitate change-out between samples.

Figure 1



Note: the holes should be vacuumed thoroughly to minimize any cross-contamination between sample depths and the bits should be decontaminated between samples. (See Section 11.0)

10.0 Sample Handling, Preservation, and Storage

10.1 Samples must be collected in glass containers for PCB analyses. In general, a 2-ounce sample container with a Teflon-lined cap (wide-mouth jars are preferred) will hold sufficient mass for most analyses. A 2-ounce jar can hold roughly 90 grams of sample.

10.2 Samples are to be shipped refrigerated and maintained at $\leq 6°C$ until the time of extraction and analysis.

10.3 The suggested holding time for PCB samples is 14 days to extraction.

11.0 Decontamination

11.1 Assemble two decontamination buckets. The first bucket contains a detergent and potable water solution, and the second bucket is for rinsate. Place all used drill bits, hose for the vacuum cleaner, and utensils in the detergent and water bucket. Scrub each piece thoroughly using the scrub brush. Note, the powder does cling to the metal surfaces, so care should be taken during this step, especially with the twists and curves of the drill bits. Next, rinse each piece with water and hexane. Place the rinsed pieces on clean paper towels and individually dry and inspect each piece. Note: all pieces should be dry prior to reuse.

11.2 Lightly contaminated drill bits and utensils may be wiped with a hexane soaked cloth and hexane rinsed for decontamination.

12.0 Data and Record Management

12.1 All data and information collection should follow a Field Data Management SOP or Quality Assurance Project Plan (QAPP).

12.2 Follow the chain of custody procedures to release the samples to the laboratory. A copy is kept with the sampling records.

12.3 The field data is stored for at least 3 years.

13.0 Quality Control and Quality Assurance

13.1 Representative samples are required. The sampler will evaluate the site specific conditions to assure the sample will be representative.

13.2 All sampling equipment must be decontaminated prior to use and between each discrete sample.

13.3 All field Quality Control (QC) sample requirements in a Sample and Analysis Plan (SAP) or QAPP must be followed. The SAP or QAPP may involve field blanks, equipment blanks, field duplicates and/or the collection of extra samples for the laboratory's quality control program.

13.4 Field duplicates should be collected at a minimum frequency of 1 per 20 samples or 1 per non-related porous matrix, whichever is greater.

14.0 Waste Management and Pollution Prevention

14.1 During field sampling events there may be PCB and/or hazardous waste produced from the sample collection. The waste must be handled and disposed of in accordance with federal, state, and local regulations. The dust filter, and tubing if a vacuum pump is used, is disposed after each site investigation. This waste will be treated as PCB waste if the samples are positive for PCBs. It may be possible to manage or dispose of the waste produced at the site where the work was performed. If the site does not meet regulatory requirements for these types of activities, the waste must be transported to a facility permitted to manage and/or dispose of the waste.

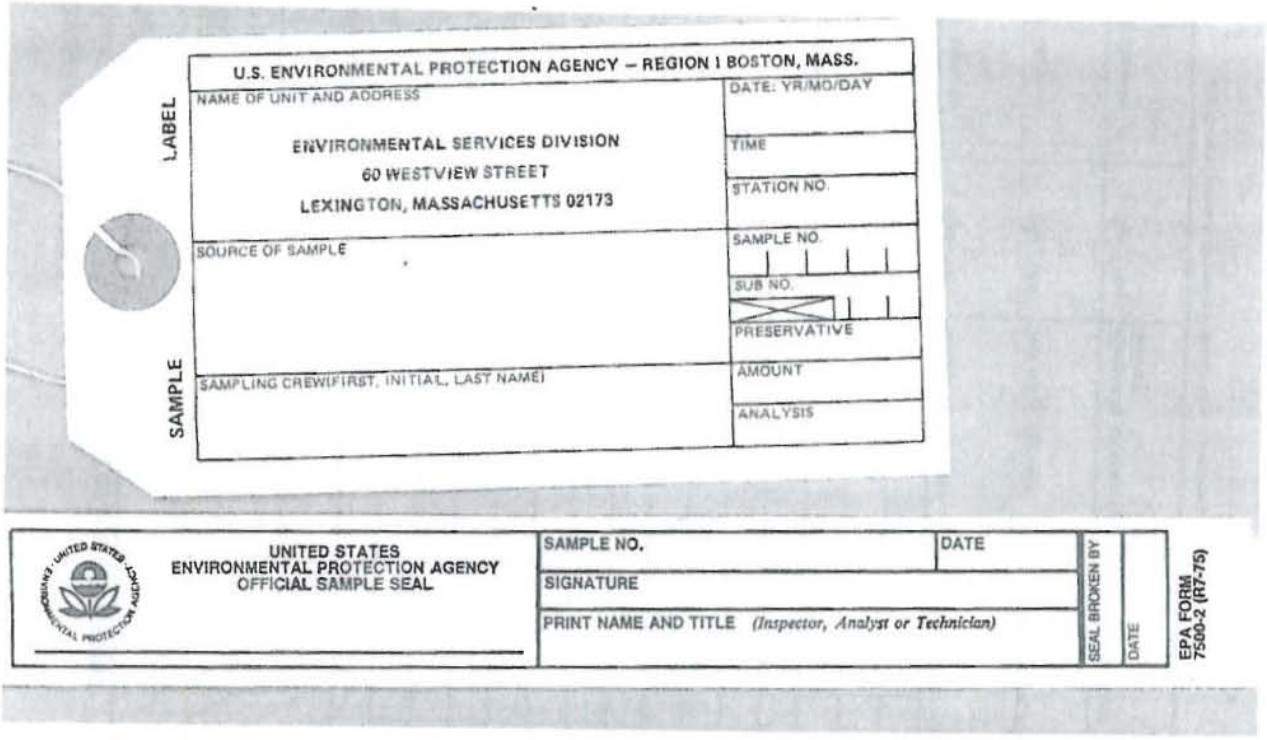
15.0 References

1. Guidance for the Preparation of Standard Operating Procedures for Quality-Related Operations, QA/G-6, EPA/600/R-96/027, November 1995.

2. 40 CFR Part 761 – Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution In Commerce, and Use Prohibitions

3. Sample Container and Holding Time: RCRA SW 846, Chapter 4, Table 4.1, Revision 4, February, 2007.

Example of Sample Label and Custody Seal



LABEL

U.S. ENVIRONMENTAL PROTECTION AGENCY – REGION I BOSTON, MASS.

NAME OF UNIT AND ADDRESS

ENVIRONMENTAL SERVICES DIVISION
60 WESTVIEW STREET
LEXINGTON, MASSACHUSETTS 02173

DATE: YR/MO/DAY

TIME

STATION NO.

SAMPLE

SOURCE OF SAMPLE

SAMPLE NO.

SUB NO.

PRESERVATIVE

SAMPLING CREW(FIRST, INITIAL, LAST NAME)

AMOUNT

ANALYSIS

UNITED STATES
ENVIRONMENTAL PROTECTION AGENCY
OFFICIAL SAMPLE SEAL

SAMPLE NO.

DATE

SIGNATURE

PRINT NAME AND TITLE *(Inspector, Analyst or Technician)*

SEAL BROKEN BY

DATE

EPA FORM
7500-2 (R7-75)

ENVIRONMENTAL PROTECTION AGENCY

REGION 1

CHAIN OF CUSTODY RECORD

PROJ. NO.	PROJECT NAME					NO. OF CON-TAINERS							REMARKS
SAMPLERS: *(Signature)*													
STA. NO.	DATE	TIME	COMP	GRAB	STATION LOCATION								

Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*	Relinquished by: *(Signature)*	Date / Time	Received by: *(Signature)*
Relinquished by: *(Signature)*	Date / Time	Received for Laboratory by: *(Signature)*	Date / Time	Remarks	

Distribution: Original Accompanies Shipment; Copy to Coordinator Field Files

1-16940

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Example of Chain of Custody Form

Appendix D

Document Sign-Off Sheet

ENVIRON International Corporation

Document Quality Control Sign-Off Sheet

Project Number: _____

Project Name: _____

Project Type: ☐ Letter ☐ Report ☐ Proposal ☐ RFP ☐ Figures ☐ SOQ
☐ Other (Define) _____

Document Title: _____

Document Path: Los Angeles Projects Drive \ \ _____

_____

Document Author(s): _____

Principal-in-Charge: _____

Project Manager: _____

Project Secretary: _____

	DOCUMENT TRACKING					
	Draft		Final		Electronic Signature	Professional Stamp
	Initials	Date	Initials	Date	Approval	
Spell Check:					☐	☐
Author Review:					☐	☐
Calculation(s) Check:					☐	☐
Technical Review:					☐	☐
Manager Review:					☐	☐
Additional Senior Level Review:					☐	☐
Editorial Review:					☐	☐
Final Spell Check:					☐	☐
Principal Review:					☐	☐
Distribution Verified:					☐	☐