

## **Protocol for Addressing Polychlorinated Biphenyls (PCBs) in Caulking Materials in School Buildings**

### **I. Background**

Recently, several school districts have discovered that PCBs are present in building caulk installed on their facilities and sometimes in the soil near caulked structures. Typical locations include windows and expansion joints. PCBs are regulated by the U.S. Environmental Protection Agency (U.S. EPA) and the State of New York, and caulk containing PCBs should be properly managed when disturbed through building renovations.

PCBs are currently prohibited from being used in caulk and other commodities (U.S. EPA, 40 CFR 761). However, prior to 1977, PCBs were present in some caulking materials used in the construction of schools and other buildings. Studies have shown that concentrations of PCB can exceed 1% (10,000 ppm) by weight in some caulk materials. An investigation of 24 buildings in the Greater Boston Area revealed that one-third of the buildings tested (8 of 24) contained caulking materials with polychlorinated biphenyl (PCB) content exceeding 50 ppm by weight with an average concentration of 15,600 ppm or 1.5% (Herrick et al., 2004). These buildings included schools and other public buildings.

The U.S. EPA regulates the disposal of caulk, as well as soil and other materials contaminated with PCBs from caulk, if the concentration of PCBs exceeds 50 ppm. Such materials must be disposed at an appropriate approved or permitted facility.

U.S. EPA regulation 40 CFR 761 defines "PCB remediation waste" to include contaminated soil, and specifies a clean-up level of <1ppm without further conditions for unrestricted use in "high occupancy areas" (i.e., areas where individuals may be present for 335 hours or more per year). PCB caulk is defined as a PCB bulk product waste, and its disposal is subject to U.S. EPA regulations under the Toxic Substances Control Act (40 CFR761.62).

**This protocol has been developed in consultation with the New York State Department of Health, Division of Environmental Health Assessment, Bureau of Toxic Substance Assessment to address concerns about properly managing caulk containing PCBs that will be disturbed during building renovation and maintenance.**

### **II. Objective**

For any school buildings constructed or renovated between 1950 and 1977 and undergoing current renovation or demolition, NYSED and NYSDOH recommend that the building(s) be evaluated prior to the renovation work to determine whether they contain caulk that is contaminated with PCBs. If so, a plan should be developed to address potential environmental and public health concerns about potential PCB exposure.

### **III. Investigation and Testing**

To adequately characterize PCB contamination, a professional environmental consultant with appropriate experience in environmental investigation and testing should prepare a detailed workplan to guide this work.

#### **A. Caulk Sample Collection**

Buildings constructed or renovated between 1950 and 1977 have a potential to contain PCBs in existing caulk. Representative samples of caulking materials from these buildings prior to renovation or

demolition work should be tested to determine whether the caulk is contaminated with PCBs. Professional judgement should be used to design the sampling plan for characterizing caulk throughout the building. The consultant should pay particular attention to construction and maintenance records and to the appearance of caulking materials (likenesses and differences). Samples should be taken from window frames or expansion joints that have not been repaired or replaced since 1977. Depending on specific information provided in the workplan developed by the project manager, such as window placement, compositing of some caulk samples might be appropriate. Caulk from different time periods or that have a different appearance should not be composited together.

It is important to note that caulk used during the time period of interest may also contain asbestos or lead. Therefore, the work plan should include testing, handling and disposal requirements appropriate for such regulated materials.

#### B. Soil Sample Collection

Buildings constructed or renovated between 1950 and 1977, which have undergone further renovation after 1977, may have residual PCB contamination in adjacent soils. An adequate representation of surface soils should be tested to assess the potential for residual PCB contamination.

When designing a representative soil sampling plan, the likelihood of soil contamination from deteriorated or deteriorating caulk should be considered. Caulk that has in the past dried out and fallen to the ground is the most important source of soil contamination. Thus, sampling should include soil beneath windows where caulk has obviously deteriorated or been replaced because of previous deterioration. Areas subject to the stress of sun and prevailing weather (typically the southern and western side of each structure) should be included for sampling. These samples would provide a conservative evaluation of soil conditions due to an increased potential for material failure, possibly resulting in contamination of soil. Also, if earlier renovation or demolition work may have stockpiled potentially contaminated caulk in other school areas, the school should consider having soils in those areas tested as well.

Soil sampling should focus on areas of the building where "banks" or "gangs" of windows exist/were replaced and areas of the structure where large expansion joints are located. This would provide a conservative evaluation of potential soil contamination and permit efficient sampling.

Any obvious pieces of caulk encountered during the collection of soil samples should be removed from the soil, categorized (with respect to location and depth) and treated as a separate potential sample.

Depth – At each soil sample location, soil should be collected in depth intervals of 0-2 inches, 2-6 inches and 6-12 inches. The surface soil sample (0-2 inches) should be collected from below the vegetative surface layer, if present.

Distance from Structure – Samples should be collected within 1 foot of the building and 5 feet from the building.

Samples should be collected in a manner that prevents cross-contamination. Augers or driven core samplers should be avoided, as any caulk caught on the edge of this type of tool could be driven to lower intervals. Using a designated trowel for each sample location and each interval of depth is encouraged. If the sampling tool is field cleaned between samples, do so in a manner that does not add solvent contamination to the environment.

#### C. Laboratory Analyses of Soil and Caulk Samples

Specific information concerning laboratory procedures and protocols must be detailed in the work plan.

Duplicate analysis should be performed on 10% of samples received by the laboratory.

The soil sample or extract of the soil sample collected at a depth of 6-12 inches may be archived until the sample results for 2-6 inches are available, provided that the appropriate sample holding times are not exceeded.

All caulk and soil samples must be analyzed for PCBs by a NYSDOH Environmental Laboratory Approval Program (ELAP) certified laboratory. ELAP certified labs can be found at the following link: [www.wadsworth.org/labcert/elap/elap.html](http://www.wadsworth.org/labcert/elap/elap.html). Results provided should be for total PCBs.

#### **IV. Abatement**

If it is determined that caulk materials contain PCBs, a site specific abatement plan should be developed to address potential environmental and public health concerns. The HUD Technical Guidelines for the Evaluation and Control of Lead-Based Paint Hazards in Housing available at [www.hud.gov/offices/lead/guidelines/hudguidelines/](http://www.hud.gov/offices/lead/guidelines/hudguidelines/) can be used as a basis for developing the steps for abating the contamination and preventing contamination of nearby areas. This is the same guideline required by NYSED to manage lead contaminated materials in schools under the RESCUE regulations. Caulking materials that contain either lead, PCBs, or both can therefore be managed under the same guidance. Caulking materials that contain asbestos in addition to either lead or PCBs or samples that contain only asbestos will be managed in accordance with requirements of the NYS Department of Labor Code Rule 56.

As stated in Section I, cleanup and disposal of PCB remediation and bulk product waste is subject to U.S. EPA regulations under the Toxic Substances Control Act (40 CFR 761) (see <http://www.epa.gov/pcb/pubs/200540cfr761.pdf>). For information or assistance pertaining to the federal PCB regulations, please contact either Daniel Kraft or James Haklar, at the Pesticides and Toxic Substances Branch of U.S. EPA Region 2. Daniel Kraft can be contacted at [kraft.daniel@epa.gov](mailto:kraft.daniel@epa.gov) or (732) 321-6669, and James Haklar can be reached at [haklar.james@epa.gov](mailto:haklar.james@epa.gov) or (732) 906-6817.

Disposal of contaminated materials from abatement activities (soil or caulk) is regulated by the NYSDEC solid waste regulations (6NYCRR Part 360) if concentrations are <50 ppm and by the hazardous waste regulations (6NYCRR 370-373) if PCB concentrations are 50 ppm or greater. Contact the NYSDEC Regional Office for additional guidance.

#### **References**

Herrick RF, McClean MD, Meeker JD, Baxter LK, Weymouth GA. 2004. An Unrecognized Source of PCB Contamination in Schools and Other Buildings. *Environmental Health Perspectives*. 112:1051-1053.

USEPA. 40 CFR 761. Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions. (<http://www.epa.gov/pcb/pubs/200540cfr761.pdf>)

6 NYCRR Part 375. Environmental Remedial Programs. Subpart 375-6: Remedial Program Soil Cleanup Objectives. §375-6.8 Soil Cleanup Objective Tables. Table 375-6.8(b): Restricted Use Soil Cleanup Objectives. (<http://www.dec.ny.gov/regs/15507.html>)

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