

4. PCBs in Building Materials

The cost/benefit analysis should consider:

- Costs for removal, verification sampling, and disposal.
- Cost of replacing substrate.
- Costs associated with obtaining EPA approval to leave **PCB remediation waste** in place.
- Cost and effectiveness of method of encapsulation (coatings, concrete cap).
- Costs of long term monitoring and maintenance of cap.
- Effect of deed restriction on property value.
- Public perception.

Cleanup Plan

- A Cleanup Plan is required for the cleanup and disposal of **PCB remediation waste**. A Cleanup Plan is not required for the removal and disposal of **PCB Bulk Product Waste**.
- When remediating to the standards specified in 40 CFR 761.61(a), prepare a Cleanup Plan in accordance with the Notification and Certification requirements of 40 CFR 761.61(a)(3). Written EPA approval is not required if characterization and remediation are performed in strict accordance with 761.61(a). However, within 30 days of notification EPA may respond that written approval will be required. If there are deviations in the characterization sampling or in the proposed verification sampling, then written EPA approval is required.
- When not remediating to the standards specified in 40 CFR 761.61(a), prepare a Cleanup Plan for EPA approval documenting (1) the results of site characterization; (2) the rationale for not remediating to the standards in 40 CFR 761.61(a); (3) plans for encapsulating, capping, or otherwise remediating **PCB remediation waste** left in place; (4) a risk characterization documenting that the proposed method(s) of encapsulation, capping, or remediation will be effective at preventing exposure to remaining PCBs; (5) a long term monitoring and maintenance plan for the surfaces; (6) plans for recording a deed restriction for the property in accordance with 40 CFR 761.61(a)(8).

Cleanup Levels for Porous Surfaces (40 CFR 761.61[a])

Examples of porous surfaces include paint or coating on metal; corroded metal, porous building stone; coated (varnished or painted) or uncoated wood; concrete or cement; plaster; plasterboard; wallboard; rubber; fiberboard; low density plastics; tar paper.

High occupancy areas (e.g. residence, day care, school, work station in a commercial or industrial facility)

- ≤1 ppm without further conditions
- >1 ppm and ≤10 ppm with a cap and a deed restriction

Low occupancy areas (e.g. unoccupied areas of a facility or areas where occupancy is transitory)

- ≤25 ppm with a deed restriction
- >25 ppm and ≤50 ppm if the site is secured by a fence and marked with a sign including the Mark M_L and a deed restriction
- >25 ppm and ≤100 ppm with a cap and a deed restriction

Cleanup Levels for Non-porous Surfaces (40 CFR 761.61[a])

Examples of non-porous surfaces include smooth un-corroded metal; smooth glass; impermeable polished building stone such as marble or granite; and high density plastics.

High occupancy areas

- ≤ 10 µg/100 cm² of surface area

Low occupancy areas

- <100 µg/100 cm² of surface area

IV. Disposal

PCB bulk product waste must be disposed of in accordance with 40 CFR 761.62

The following types of **PCB bulk product waste** may be disposed of in a State-permitted non-hazardous landfill

- Plastics
- Rubber parts
- Coatings
- Sealants
- Other **bulk product waste** that leaches PCBs at <10 micrograms/liter (µ/L) of water.

Brochure Series

Guiding States and Brownfield Projects through the PCB Rules under TSCA: Navigating the TSCA process is complex and represents a challenge for many Brownfield remediation and redevelopment projects which can stretch limited funds. This brochure series focuses on the topics most relevant to the states and their Brownfield stakeholders:

1. Working with the Federal and State PCB Regulations on Brownfield Sites: When and What Federal Involvement is Required;

2. Characterization: Sampling and Testing Approaches for PCBs;

3. Cleanup and Management of PCBs;

4. PCBs in Building Materials; and

5. PCB Articles, Containers and Liquids.

Various building products produced from the 1950's through the 1970's were manufactured with polychlorinated biphenyls (PCBs) as a key ingredient because of its non-flammability, chemical stability, high boiling point, and electrical and thermal insulating properties. PCBs were also added to many building products as a plasticizer, which imparted flexibility.

Buildings constructed or renovated from the 1950's through the 1970's may include building products manufactured with PCBs. Examples of potentially PCB-containing building products include:

- Caulking and grout in floor and wall joints
- Oil-based paint coating floors and walls
- Mastic and adhesives used under flooring (tiles and carpets)
- Sealants and finishing used on flooring
- Gaskets around windows and doors and in heating, ventilation, and air conditioning systems and ducting
- Window glazing
- Roofing and siding

Building products found to contain ≥ 50 ppm PCBs are classified as **PCB bulk product waste** under federal regulations through the Toxics Substances Control Act (TSCA) found in Chapter 40 of the Code of Federal Regulations (CFR) (40 CFR 761). **PCB bulk product waste** is "unauthorized for use" and must be removed and disposed of in accordance with 40 CFR 761.62.

Materials that have come into contact with **PCB bulk product waste** may have become contaminated with PCBs. These materials may be considered **PCB bulk product waste** or **PCB remediation waste**, as defined below. **PCB remediation waste** must be managed in accordance with 40 CFR 761.61.

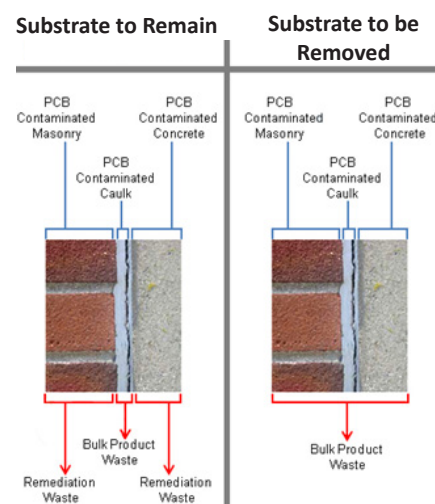
On October 24, 2012, USEPA (EPA) issued a reinterpretation of its definitions of **PCB bulk product waste** and **PCB remediation waste**. This reinterpretation allows building materials (i.e. substrates) that are "coated or serviced" with **PCB bulk product waste** at the time of designation for disposal to be managed and disposed of as **PCB bulk product waste**. However, PCB contaminated substrates that remain in place after the **PCB bulk product waste** has been removed must be managed as **PCB remediation waste**. This reinterpretation allows PCB-contaminated substrate (regardless of concentration) if removed and designated for disposal at the same time as the **PCB bulk product waste** to be disposed of at a State licensed non-hazardous landfill. Disposal of **PCB bulk product waste** is generally less costly than disposal of **PCB remediation waste**.

Under EPA's reinterpretation, examples of **PCB bulk product waste** include:

- Caulk, paint, mastic, adhesives, sealants, etc.
- The PCB contaminated substrate if the substrate is removed and designated for disposal at the same time as the associated **PCB bulk product waste**. Examples of the types of substrates that would then be considered **PCB bulk product waste** include:
 - o Concrete adjacent to caulked or grouted joints
 - o Concrete, wood, or other substrate coated with a PCB-containing paint
 - o Flooring materials, including tiles and carpets, coated with mastic, adhesives, sealants, etc.
 - o Window materials in contact with gaskets and glazing

Examples of **PCB remediation waste** in buildings include:

- Substrate (concrete, wood, flooring materials, etc.) contaminated with PCBs from a **PCB bulk product waste** (caulk, paint, etc.), if the **PCB bulk product waste** has been removed and the substrate remains in place.
- Soil beneath caulked or grouted joints.
- Flooring impacted by a release of PCB-containing hydraulic, cutting, or transformer oils.
- Light fixtures impacted by a release of PCBs from PCB-containing ballast.



The purpose of this brochure is to guide a building owner through the process of evaluating:

- I. When to sample and test for PCBs in a building
- II. Suspect **PCB bulk product waste** and the extent of contaminated substrate
- III. Whether or not to remove and dispose of PCB contaminated substrate as **PCB bulk product waste** or remove only the **PCB bulk product waste** and manage the substrate as **PCB remediation waste**.
- IV. Disposal options for **PCB bulk product waste** and **PCB remediation waste**.

When Should Building Materials be Sampled and Tested for PCBs?

Buildings constructed or renovated from the 1950's through the 1970's may include building products manufactured with PCBs. Although the use of products with PCB concentrations greater than 50 ppm is unauthorized, there is no regulatory requirement to test products in use to determine their PCB concentration. However, **PCB bulk product waste** is regulated for disposal. In general, there are three scenarios that could prompt consideration for PCB sampling and testing of building products:

- Scenario 1: Demolition
- Scenario 2: Renovation
- Scenario 3: Concern regarding the potential health risk due to the potential presence of PCB-containing building materials

Scenario 1: Demolition

Demolition waste that contains **PCB bulk product waste** must be properly disposed. Generally, if the entire building is to be demolished, then the **PCB bulk product waste** and contaminated substrate would all be managed as **PCB bulk product waste**. To evaluate the building materials and identify the appropriate disposal options:

- Perform a thorough survey of the building to identify suspect **PCB bulk product waste** (see below sections of this brochure for guidance).
- Fully characterize suspect **PCB bulk product waste** for disposal. If **PCB bulk product waste** is identified, characterize the adjacent substrate to determine if it is contaminated by PCBs.
- Consider conducting sampling of the extent of the PCB contaminated substrate prior to demolition.
- Manage and dispose of contaminated substrate as **PCB bulk product waste**.

Scenario 2: Renovation

PCB bulk product waste generated during renovation must be properly disposed. **PCB bulk product waste**, even in areas not planned for renovation, is not authorized for use and must be removed and properly disposed.

Once **PCB bulk product waste** (caulk, paint, sealant, etc.) has been identified in areas planned for renovation, and the extent of PCB contamination in adjacent substrate has been determined, remove the **PCB bulk product waste** and adjacent substrate. Manage both the **bulk product waste** and substrate as **PCB bulk product waste** and remove all substrate with PCB concentrations greater than 1 ppm.

Alternatively, with EPA approval, remove only the **PCB bulk product waste** (caulk, paint, sealant, etc.) and leave the PCB contaminated substrate in place. The remaining substrate must now be managed as **PCB remediation waste**. You must know the concentrations of PCBs in the remaining substrate to identify the proper method of management of the material. Encapsulation is one method of managing the remaining material (see below sections of this brochure for guidance).

Scenario 3: Concern for Potential Health Risks

Air sampling may be performed to evaluate the potential for increased risk to building occupants as a result of exposure to suspect **PCB bulk product waste**. A recommended, phased approach is:

- Sample indoor air for PCBs and compare the results to established appropriate public health levels or Occupational Health and Safety (OSHA) exposure limits.
- If PCBs are detected in indoor air samples at levels that could pose added risk to occupants, perform a phased approach to evaluating and removing the source (i.e. **PCB bulk product waste**) of PCBs to indoor air.
- Address each potential source individually, and re-test indoor air.

If after removal of a PCB source the indoor air levels are acceptable, no additional PCB sources may need to be identified.

By starting with air sampling rather than initially testing all suspect **PCB bulk product waste**, the extent of the sampling, **PCB bulk product waste** removal, and the adjacent contaminated substrate removal or encapsulation may be managed.

II. Sampling Suspect **PCB Bulk Product Waste** and PCB Contaminated Substrate

- Identify and document the locations of each type of suspect **PCB bulk product waste**, noting similar materials of varying color and age. (In maintenance shops, garages, and around electrical equipment, document stained areas of flooring.)
- Sample the suspect **PCB bulk product waste**, adjacent substrate, and stained areas, collecting a representative sample of each different type of suspect **PCB bulk product waste**, adjacent substrate or stained area.
 - o Collect bulk samples as opposed to wipe samples.
 - o Collect grab samples as opposed to composite samples.
 - o For concrete, use the sampling method described in Region 1 EPA-New England Draft Standard Operating Procedure for Sampling Concrete in the Field. <http://www.epa.gov/osw/hazard/tsd/pcbs/pubs/pcb-guid3-06.pdf>
- Sampling of adjacent substrate may best be conducted after test results confirm the presence of **PCB bulk product waste**.

Evaluating the results of chemical testing:

- Bulk product sample results greater than or equal to 50 ppm PCBs indicate that the material is **PCB bulk product waste** and must be removed. Removal and off-site disposal of **PCB bulk product waste** does not require EPA approval. Disposal options are listed on the following pages.

If **PCB bulk product waste** is confirmed, the adjacent substrate must also be evaluated for PCBs and if present, removed and disposed of as **PCB bulk product waste** or managed as **PCB remediation waste**.

The PCB contaminated substrate may be left in place after removal of the **PCB bulk product waste** and managed as **PCB remediation waste**. **PCB remediation waste** left in place must be encapsulated or otherwise treated to prevent exposure to PCBs in the material. EPA approval is required if **PCB remediation waste** is left in place.

- Bulk product sample results less than 50 ppm PCBs indicate that the bulk product may be considered an excluded PCB product under 40 CFR 761.3 and if so, continued use is allowed. To meet the definition of excluded PCB product, the original product and its original installation date must both be prior to October 1, 1984. Substrate adjacent to an excluded PCB product, even if PCB contaminated, is not **PCB remediation waste** nor is it **PCB bulk product waste**. The substrate does not need to be removed or remediated.

Excluded Product Scenario: Caulking in the expansion joints of a building that was originally constructed in 1969 has been removed and replaced over the years as part of regular maintenance activities. PCBs were detected at concentrations less than 50 ppm in caulking that was replaced within the last 10 years. This caulking cannot be considered an Excluded PCB Product under 40 CFR 761.3 for the following reasons:

1. The caulking is not the originally installed caulking and was not installed prior to October 1, 1984.
2. The caulking may have been re-contaminated by residual PCB product in the joint that had greater than 50 ppm PCBs. As a result, the newly installed caulking is considered **PCB remediation waste** and must be remediated.
3. The material adjacent to the caulking is considered **PCB remediation waste** and must be remediated.

III. Remove or Leave in Place?

The removal and proper disposal of **PCB bulk product waste** is required under TSCA. If the adjacent PCB contaminated substrate is removed at the same time as the **PCB bulk product waste**, then it is also considered **PCB Bulk Product Waste** and can be managed and disposed of as such. However, EPA may issue an approval to leave in place the adjacent PCB contaminated substrate. The PCB contaminated substrate would then be considered **PCB remediation waste**. Certain conditions must be met for EPA to approve leaving PCB contaminated materials in place.

Information Needed to Make the Decision:

- The extent and concentration of PCBs in the adjacent substrate.
 - o Characterize the extent of PCB contamination in the adjacent substrate in accordance with 40 CFR Subpart N. However, EPA may approve a reduced sampling frequency.
- Cost/benefit analysis of removing the PCB contaminated substrate versus leaving it in place. Leaving contaminated substrate in-place will require encapsulating or capping the PCB-contaminated substrate to prevent exposure; long term monitoring and maintenance of the encapsulated/capped surfaces; and recording a deed restriction for the property.

Options for other types of **PCB bulk product waste** include:

- An EPA-approved incinerator
- An EPA-approved chemical waste landfill
- An EPA or State-permitted RCRA landfill

Under certain conditions, the above types of **PCB bulk product waste** may be disposed of as daily landfill cover or road-bed (See 761.62[d]).

PCB remediation waste must be disposed of in accordance with 40 CFR 761.61(5).

- ≥50 ppm PCBs
 - o No sampling required
 - o Disposal facilities
 - RCRA Hazardous waste landfill permitted by EPA or State
 - EPA Approved PCB disposal facility
- <50 ppm PCBs
 - o Sample in accordance with 40 CFR Subpart O or obtain EPA approval of alternate sampling frequency
 - o Disposal facilities
 - State licensed municipal solid waste facility
 - State licensed non-municipal non-hazardous waste facility
 - RCRA Hazardous waste landfill permitted by EPA or State
 - EPA approved PCB disposal facility.

References

EPA Website: <http://www.epa.gov/epawaste/hazard/tsd/pcbs/index.htm>.

The following documents are available at the EPA website:

- *Code of Federal Regulations Part 761.*
- *The Polychlorinated Biphenyl (PCB) Site Revitalization Guidance, Nov. 2005.*
- *PCB Questions and Answers Manual, Updated January 2009.*
- *Draft Standard Operating Procedure for Sampling Concrete in the Field, EPA-Region 1, New England, December 30, 1997.*
- *PCB Bulk Product Waste Reinterpretation, EPA, October 24, 2012*

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For **State Contact Information**, please see Brochure #5 - **PCB Articles, Containers and Liquids**

This guidance document addresses cleanup and disposal requirements for Polychlorinated Biphenyls (PCBs) only. This guidance document does not replace or supplant the requirements of the Toxic Substances Control Act (TSCA) PCB regulations. Please refer to the PCB regulations at 40 CFR Part 761 for specific regulatory and legal requirements.

