State of Vermont
Department of Environmental Conservation
Waste Management & Prevention Division
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AGENCY OF NATURAL RESOURCES

PCB Building Material Characterization Guidance

The Vermont Department of Environmental Conservation (VTDEC) is implementing a statewide program to test indoor air for Polychlorinated Biphenyls (PCBs) in public and independent schools constructed or renovated before 1980 (Vermont Legislature 2021). This guidance document has been prepared to provide direction on proper sampling protocols of building materials which meet both the requirements of Agency of Natural Resources and the regulatory requirements of the Environmental Protection Agency (EPA) Toxic Substances Control Act (TSCA) PCB program when a Vermont Department of Health (Health) School Action Level has been exceeded in indoor air (Health, 2021). When the potential for asbestos to be co-located with PCBs work should be done in compliance with Health's Vermont Regulations For Asbestos Control (VRAC) and EPA's Asbestos Containing Materials in Schools Rule regulations (Health 1995, EPA 2011).

Results above a School Action Level (SAL) require additional work to characterize potential PCB containing materials and remove sources of PCBs. It is VTDEC's expectation that characterization will occur to identify exceedances greater than 1 ppm.

A work plan must be prepared in compliance with VTDEC's Investigation and Remediation of Contaminated Properties Rule (IRule) § 35-304 Site Investigation Work Plan and Initial Site Investigation Workplan guidance below and submitted to the VTDEC for approval prior to initiating onsite work.

Materials characterization is an iterative process. An initial material sampling event will be conducted to identify the potential PCB sources. Determining the degree and extent of contamination may require additional sampling events.

Sampling and Analysis

The identification of PCB-containing building materials to be sampled should be based upon potential PCB-containing material types identified in the building inventory and based on exceedances of indoor air sampling results from each grouped location. All potential PCB-containing material types identified during the building inventory should be sampled in tested and untested rooms. Sufficient representative samples of each material type should be collected.

For the initial sampling a minimum of 3 samples per suspected PCB containing material per room or space in each group per material classification described in the building inventory is sufficient to inform subsequent sampling events. Alternative investigation sampling such as sampling of 30% of the investigative material in a group or other sampling frequencies is supported with written justification in the site investigation workplan.

If review of the initial sampling and analysis results indicate additional samples should be collected to adequately characterize the PCB-containing building material, the preferred approach is outlined in EPA Technical Guidance for Determining the Presence of Polychlorinated Biphenyls (PCBs) at Regulated Concentrations on Vessels (Ships) to be Reflagged (Appendix II worksheets). The EPA technical guidance provides valuable information for PCB materials sampling approaches. EPA methods for sampling and analyses are referenced to ensure consistency amongst regulatory programs and use of methods proven to be effective.

Tiered analysis of the collected samples is supported as part of site investigation. For example, all collected samples may not require analysis depending on cleanup selected in 40 CFR 761.61 or 40 CFR 761.62 and proposed in a Corrective Action Plan (CAP). EPA Technical Guidance for Determining the Presence of Polychlorinated Biphenyls (PCBs) at Regulated Concentrations on Vessels (Ships) to be Reflagged (Appendix II worksheets) is the preferred approach to meet cleanup or disposal requirements characterization in 40 CFR 761.61(c) (EPA 2022a). Any unanalyzed samples should be held for analysis until the CAP has been completed and indoor air has been resampled.

Reporting Limits (RL) should be 2-5 times less than the Action Limit (AL). DEC and EPA require an AL of 1 ppm for porous surfaces or 10µg/100 cm^2 for non porous surface and when reporting results. If this is not achievable, the Reporting Limit should be less than the Action Limit (i.e., the Reporting Limit should not be equal to the Action Limit).

Sampling Resources

It is the VTDEC's expectation consultants conducting sampling of building materials have reviewed and are familiar with the following:

- EPA's Standard Operating Procedure for Sampling Porous Surfaces for PCBs for guidance (EPA 2011).
- Standard wipe tests for non porous surfaces detailed in 40 CFR 761.123 (EPA 2022a).
- Bulk sample collection procedures outlined in EPA's How to Test for PCBs and Characterize Suspect Materials. (EPA 2022c).

Initial Site Investigation Workplan

An initial workplan for building material sampling must include the following:

1. Property history. A history of past and present land use and potential sources of PCBs. This should include any information pertaining to updates or renovations to the building that may have occurred since its original construction.
2. Conceptual Site Model. A conceptual site model in accordance with the Investigation and Remediation of Contaminated Properties Rule (IRule) § 35-302.
3. Site characterization objectives and strategy. Known data gaps should be identified and addressed with detailed contaminant characterization methods, sampling locations and methods and how sampling will meet the site investigation objectives relevant to potential sources of PCBs.
4. Justification of sampling locations and type of sampling based on information collected during inventory, and indoor air sampling results. A minimum of 3 samples per suspected PCB containing material per room or space in each group per material classification described in the building inventory is sufficient to inform subsequent sampling events. Alternative investigation sampling such as sampling of 30% of the investigative material in a group or other sampling frequencies is supported with written justification.

5. Sample extraction should be EPA SW-846 Method 3540C - Soxhlet Extraction for the chemical extraction of PCBs from solid samples (EPA 2022b). EPA PCB regulations also allow for the use of any other extraction method which is validated under Subpart Q of 40 CFR 761 (EPA 2022a).
6. Samples should be analyzed by EPA SW-846 Method 8082A for Aroclors 1016, 1221, 1232, 1242, 1248, 1254, 1260, 1262, 1268 and reported as Total Reportable PCBs Total Reportable PCBs is the sum of all Aroclors.
7. For results greater than 50 ppm which are regulated under TSCA, alternative characterization may be proposed in accordance with 40 CFR 761.61 or 40 CFR 761.62. To meet potential cleanup or disposal requirements characterization must comply with 40 CFR 761.61(c) (EPA 2022a).
8. A detailed site map that includes sampling locations and previous indoor air sampling locations if applicable.
9. An initial workplan cost estimate.
10. An appendix containing copies of inventories, reports and field notes used in justification of initial sampling design.

Final Site Investigation Report

The final report must include all workplans and cost estimates from the site investigation(s) as appendices. In addition to the site investigation workplan elements described above the final report should include the following:

1. Justification of sampling locations and type of sampling based on information collected during inventory and indoor sampling results. Include any applicable calculation worksheets used for sample size calculations from Appendix II of Technical Guidance for Determining the Presence of Polychlorinated Biphenyls (PCBs) at Regulated Concentrations on Vessels (Ships) to be Reflagged (EPA 2013).
2. A discussion of any deviations from the site investigation workplan(s) that occurred.
3. A detailed site map showing all sample locations and corresponding results.
4. Analytical results presented in tabular format of individual Aroclors, total Aroclors and the applicable Health Department School Action Level. Tabular results in Excel format should also be provided.
5. Reporting Limits (RL) should be 2-5 times less than the Action Limit (AL). DEC and EPA require an AL of 1 ppm for porous surfaces or 10µg/100 cm^2 for non porous surface when reporting results. If this is not achievable, the Reporting Limit should be less than the Action Limit (i.e., the Reporting Limit should not be equal to the Action Limit).
6. A copy of the laboratory reports, chain of custody documentation, all quality assurance data, and analytical chromatograms from each sample.
7. Copies of the original field notes shall be attached as an appendix and the field notes should contain the following minimum content: the date the work was performed, name of the person conducting the work, tasks completed, documentation of weather conditions, sampling timeline with locations, sampling logs, field monitoring results, and calibration information for each type of field analytical equipment.
8. Data interpretation, conclusions and recommendations for any next steps related to the findings.

Questions? If you have further questions about PCBs in schools, please email SOV.PCBSampling@vermont.gov.

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July 13, 2023
Effective Date

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