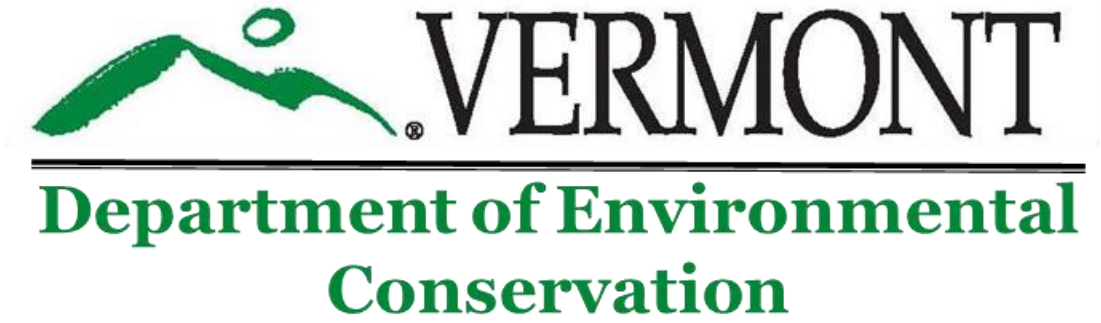
Protecting the Most Vulnerable Indoor Air Testing for Polychlorinated Biphenyls (PCBs) in Vermont Schools



What are Polychlorinated Biphenyls

Polychlorinated Biphenyls(PCBs) are:

- Human made chemicals
  - Commonly used in building materials and electrical equipment
  - Banned by EPA in 1979
- PCBs may harm the immune, reproductive, nervous and endocrine systems
  - Results in impaired immunologic development, fertility problems, changes to brain development in utero, thyroid hormone changes, increase in Type 2 diabetes
- Are Cancer Causing

Potential PCB containing Building Materials

PCBs were used historically in building products to impart flexibility in certain products such as:

- Caulking
- Paint
- Fluorescent Light Ballasts
- Window Glazing
- Ceiling Tiles
- Spray-on Fireproofing
- Floor Finish
- Mastics (glue or resin)

Why are PCBs in Building Materials a Concern?

How PCB containing building materials impact indoor air:

- Released into the air through off-gassing
- PCBs in the air can be absorbed into other building materials, furnishings and dust
- PCBs present in some products, caulking or paint, could move directly into adjoining materials and contaminate them (wood or concrete)

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Determining Exposure to PCBs in the Indoor Air of Your School

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Was your school constructed or renovated before 1980?

No → No testing is needed.

Does your school have old fluorescent light ballasts?
Check to see if they were replaced.

Yes → Remove ballasts before testing the air.

Are there other sources of PCBs in the school?
Use the checklist for identifying sources of PCBs.

Testing the indoor air for PCBs is recommended.
Follow the guidance for testing indoor air for PCBs.

Provide the test results to the Vermont Department of Health and the Department of Environmental Conservation (DEC).

If the results are above the screening value, work with Health and DEC to develop a plan to address the sources of PCBs and minimize exposures.

Questions?

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PCBs are detected in Indoor Air….What Next

Next Steps and Minimizing Exposures

Remove all PCB containing Fluorescent Light Ballasts and any PCB-stained fixtures (if they exist).

Implement Best Management Practices: proper ventilation and wet cleaning dust from all surfaces.

Collaborate with Health on detected concentrations, risk and next steps.

Identify and sample potential PCB sources in the school.

Remove, to extent feasible, all PCB impacted building materials

Mitigate exposure to building materials that cannot be removed

Indoor Air Screening Values

Vermont Department of Health screening value for PCBs in Indoor Air is 15 ng/m^3 . Detections of PCBs in Indoor Air less than 15 ng/m^3 will not need further evaluation.

EPA derived the Exposure Levels below to serve as health protective values intended for evaluation purposes. They should not be interpreted nor applied as “bright line” or “not-to-exceed” criteria, but may be used to guide thoughtful evaluation of indoor air quality in schools. EPA recommends that the concentrations of PCBs in indoor air be kept as low as reasonably achievable.

Exposure Levels for Evaluating PCBs in School Indoor Air (ng/m3)*						
Age: 1-<2 yr	Age: 2-<3 yr	Age: 3-<6 yr	Age: 6-<12 yr elementary school	Age: 12-15< yr middle school	Age: 15-<19 yr high school	Age: 19+ yr adult
100	100	200	300	500	600	500

2013 Vermont School Pilot Test

Barre Town Elementary

- 23 indoor air samples collected;
- 3 of the 23 samples had detections, all others were ND below 15 ng/m^3;
- Detected concentrations were 33 ng/m^3, 56 ng/m^3 and 130 ng/m^3; and
- VDH determined that these levels were not a significant health threat because the average indoor air concentration was below 15 ng/m^3.

Champlain Elementary School, Burlington

- 20 indoor air samples were collected;
- 4 of the 20 samples had detections, all others were ND below 15 ng/m^3;
- Detected concentrations were 27 ng/m^3, 32 ng/m^3, 36 ng/m^3 and 65 ng/m^3
- VDH determined that these levels were not a significant health threat because the average indoor air concentration was below 15 ng/m^3.

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2013 Vermont School Pilot Test

- Holland Elementary
  - 10 indoor air samples collected
  - All samples were ND below 15 15 ng/m^3
- Mt Anthony, Bennington
  - 24 indoor air samples were collected
  - All samples were ND below 15 ng/m^3

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Burlington High School Indoor Air Results

Building A

- 12 indoor air samples collected;
- Detected concentrations ranged from 4 ng/m3 to 260 ng/m3;
- Building Survey to determine potential PCB building products and sampling;
- Caulking and floor Mastic have elevated concentrations

• Building B

- 12 indoor air samples collected;
- Detected concentrations ranged from 27 ng/m3 to 270 ng/m3;
- Building Survey to determine potential PCB building products and sampling;

• Building D

- 10 indoor air samples collected;
- Detected concentrations ranged from 11 ng/m3 to 300 ng/m3;
- Building Survey to determine potential PCB building products and sampling;

• Building F

- 17 indoor air samples collected;
- Detected concentrations ranged from 160 ng/m3 to 7100 ng/m3;
- Building Survey to determine potential PCB building products and sampling;

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Budget Considerations

Estimated up to 300 schools statewide could require indoor air testing

- built or renovated before 1980

The cost for indoor air sampling is estimated to be between $15,000 and $20,000 per school ($4,500,000)

Remaining funds will be used to:

- Provide a publicly accessible data management system
- Provide technical assistance

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Not Considered in the Budget

Testing Potential PCB Containing Building Materials

- Assume between $10,000 and $300,000 (or more) per school

Remediating or Mitigating an Impacted School

- Assume between $50,000 (low), $200,000 (medium), $1M to $18M (high)

Additional cost for assessment and cleanup (estimates):

- Sampling $5,000,000
- Cleanup $36,000,000 (does not include replacement costs)