



Asbestos Assessments and Abatement Following Unplanned or Accidental Release to the Environment

Generally Accepted Best Practices

The Environmental Abatement Council of Canada (EACC), an organization of professional environmental abatement contractors, consultants, suppliers and laboratories, has prepared the following information to outline the essential components of an assessment for asbestos and, if required, procedures for asbestos abatement following an unplanned or accidental release to the outdoor environment or within a building.

Assessments for asbestos are generally completed to achieve Regulatory compliance, such as for management purposes or prior to a maintenance, renovation or demolition project and the assessment criteria are well established by regulations or published guidelines. The current document has been prepared for a different but related purpose, namely to address the potential hazard following unplanned or accidental disturbance of materials that are suspected to contain asbestos. This can include events ranging from incidental disturbance of potential asbestos-containing materials (ACM), such as during normal day-to-day operations or during a planned project, to severe disturbances of potential ACM during catastrophic events, such as during an unexpected building collapse. This document has been prepared to assist consultants and contractors who encounter these situations and was initiated when it became apparent (during two recent events in the City of Toronto) that no such general guidance existed to address this very specific type of asbestos assessment.

It should be noted that all assessments and abatement should be conducted by professional environmental consultants and contractors who should have the appropriate insurance coverage, training, equipment and experience. A list of qualified firms in can be found by following the link:

<https://www.eaccan.com/members>

Asbestos is hazardous material that is highly regulated in all Canadian jurisdictions. Refer to the legislation that is applicable to each project and work area to ensure regulatory compliance.

Assessments for Asbestos

An assessment for asbestos generally consists of 4 parts:

- Visual assessment - to determine extent of contamination by suspect materials,
- Sampling - to confirm presence of asbestos in bulk materials, dust or air,
- Interpretation of laboratory results by qualified professionals, and
- Reporting.

Visual Assessment

During the visual assessment, the consultant should check surfaces (interior and exterior) for visible signs of contamination such as an accumulation of settled dust (in areas usually cleaned on a routine basis) and for signs of foreign debris or damage to building materials.

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It should be noted that asbestos was used in thousands of building materials and many buildings may have been constructed with one or more of these materials. Left undisturbed asbestos-containing materials pose very little risk, however risks of exposure to airborne asbestos increase if the materials are disturbed during construction/renovation projects and during catastrophic events.

Once the assessment is complete, the consultant will undertake sampling of the suspect materials noted during the visual assessment to determine if they are asbestos-containing.

Sampling of Materials

Several strategies exist for sampling of surfaces or materials suspected of containing asbestos.

Bulk Materials

The sampling of bulk materials suspected of containing asbestos should be performed following regulatory requirements of the jurisdiction where work is being completed. In Ontario, Regulation 278/05 specifies the minimum number of samples, of a particular homogeneous building material, that should be collected and tested to consider a material non-asbestos-containing. The requirements are summarized in the following table:

Type of Material	Size of area of homogeneous material	Minimum number of bulk material samples to be collected
1) Surfacing material, including without limitation material that is applied to surfaces by spraying, by troweling or otherwise, such as acoustical plaster on ceilings and fireproofing materials on structural members	Less than 90 square metres	3
	90 or more square metres, but less than 450 square metres	5
	450 or more square metres	7
2) Thermal insulation, except as described in item 3	any size	3
3) Thermal insulation patch	Less than 2 linear metres or 0.5 square metres	1
4) Other material	Any size	3

Following the collection of the samples, they should be submitted to a laboratory that specializes in the analysis of asbestos and one that participates in the United States National Voluntary Laboratory Accreditation Program (NVLAP). Analysis should be performed using the lower limit of an asbestos-containing material (ACM) in Ontario of 0.5%. (**NOTE:** the concentration at which a material is defined as an asbestos-containing material is legislatively defined in each Canadian jurisdiction). However, concentrations of asbestos in settled dust that are lower than the defined limit may still indicate the presence of asbestos contamination.

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Dust

Sampling of surfaces for dust suspected of containing asbestos may be performed following the American Society for Testing and Materials (ASTM) *Standard Test Method for Microvacuum Sampling and Indirect Analysis of Dust by Transmission Electron Microscopy for Asbestos Structure Number Surface Loading* (D5755-09), or *Standard Test Method for Wipe Sampling of Surfaces, Indirect Preparation, and Analysis for Asbestos Structure Number Surface Loading by Transmission Electron Microscopy* D6480-19. It should be noted that no regulated level of asbestos in dust exists in Canada. Asbestos is commonly found in dust in outdoor locations, and in buildings (whether asbestos is used in building materials or not), due to natural background concentrations. These results must be interpreted with care and compared to natural background concentrations to be meaningful. Exceedingly variable results are common in dust testing since the presence of a single clump of asbestos can have a huge effect on the reported concentration since it will be broken down into multiple fibres during the sample preparation.

Air Monitoring

Air Monitoring may be a very useful tool to obtain evidence of contamination of a premises particularly where the suspect asbestos-containing material may have been deposited as a dust as opposed to pieces of material. Air monitoring is normally performed only in enclosed spaces (buildings) however monitoring out-of doors will indicate the normal background or presence of outdoor contamination. Air monitoring analysis may be performed by optical microscope to compare measured levels to Occupational Exposure Levels; however Transmission Electron Microscope (TEM) analysis is preferable if the turn-around time is acceptable. Use of the TEM will allow asbestos fibres to be distinguished from non-asbestos fibres. Use of NIOSH Method 7402 allows comparison of the affected area with acceptable levels following Type 3 removal and clean-up. Use of the U.S. EPA Level II analysis allows comparison with ambient background concentration as well since it detects all fibres (even fibres too thin or too short to be regulated or counted by the optical microscope (NIOSH 7400) or the Transmission Electron Microscope (NIOSH Method 7402).

Air monitoring may be useful to eliminate the variability found in dust testing and provides a more realistic assessment of exposure of occupants. Monitoring should be performed under normal occupant activity (if the building is already occupied), during other activities such as cleaning of the premises, or using some means of disturbing the air to simulate occupant activity (normally called aggressive testing). If aggressive testing is performed care must be taken to avoid creating excessive dust which would prevent analysis of the sample. Aggressive testing, commonly used for Type 3 air clearance of a cleaned and sealed abatement site, may not be appropriate to test premises affected by a catastrophic event or where other significant dust is present.

Interpretation of Analytical Results

Following the receipt of the analytical results, the consultants will cross-reference the results with the visual observations to determine the homogeneous areas with confirmed asbestos-containing materials. Once this has been performed and the extent, friability and condition of asbestos-containing materials has been determined, recommendations should be made for remediation if required. The extent of the contamination determined by dust testing indicates only the area to be cleaned and does not necessarily reflect any airborne asbestos hazard. Air sampling may more usefully indicate possible human exposure to airborne asbestos. The results obtained should be compared to known background levels of airborne asbestos when interpreting results or making recommendations.

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Reporting

The initial assessment report will describe the intent of the assessment, the visual observations made by the assessors, the results of the analytical testing, conclusions and recommendations. Drawings and photographs may also be included in the report.

Cleaning or Asbestos Abatement?

Testing of premises for asbestos in debris or dust may or may not show the presence of asbestos. Even if no asbestos contamination above background levels is detected, cleaning by wet methods or using a HEPA filtered vacuum is recommended. While no asbestos precautions or asbestos waste disposal is required the use of these cleaning methods will help to allay occupant concerns with no additional cost.

If the presence of asbestos contamination is confirmed, or assumed, then the appropriate asbestos procedures must be followed. Depending on the levels of contamination, and the nature of the asbestos-containing material, the work may be classified as a Type 1 (Low Risk), Type 2 (Moderate Risk) or Type 3 (High Risk) operation and the corresponding level of asbestos safety precautions need to be followed. Remediation methods implemented must comply with the regulatory requirements of the jurisdiction where work is being completed. The cleanup of friable asbestos debris is generally a Type 2 (Moderate Risk) operation and requires the use of personal protective equipment and clothing such as a ½-face respirator with P100 particulate filters and disposable full-body coveralls that are impervious to asbestos fibres. Clean up of non-friable asbestos is generally a Type 1 (Low Risk) operation.

Generally all surfaces should be vacuumed with a HEPA filtered vacuum (a specifically designed vacuum for asbestos abatement) and then the surfaces should be wet-wiped to remove any residual dust or simply wet washed. Outdoor surfaces (i.e. grass, asphalt roadways, roofs, gardens, etc.) will require site specific clean-up measures depending on the nature of the surface.

Depending on the impact to the property following a catastrophic event, it should be noted that attics, crawlspaces and HVAC ductwork may need to be assessed prior to the completion of the remediation activities.

Clearance Sampling

Following the completion of the abatement activities, clearance sampling maybe be required for legal compliance or for occupant peace of mind. Clearance sampling will determine the completeness of the abatement program by confirming that asbestos identified during the initial assessment has been removed.

All Canadian jurisdictions have legislative requirements for clearance air monitoring following Type 3 (High Risk) operations. In Ontario, Regulation 278/05 requires clearance air sampling for indoor Type 3 sites prior to turning the area back over to the owner. The Regulation stipulates the number of air samples required, the methods for sampling and the analytical techniques to be utilized. In the case of a Type 3 operation, the Regulation requires the use of “forced air”, which is defined by the MOL as aggressive air sampling. Aggressive air sampling requires the consultant to disturb the air with a leaf blower for approximately 5 minutes (for every 1000 square feet) prior to sampling and also to set up at least one 20” box fan in the work area to keep the air moving during the sampling program. Samples should be collected following the analytical techniques specified in the Regulation and should have a minimum volume of 2400 litres of air. Analysis of the samples should be performed by accredited laboratories following NIOSH 7400 A counting rules. For Type 3 work areas, Ontario Regulation 278/05 stipulates a clearance criterion of 0.01 f/cc² by Phase Contrast Microscopy (PCM).

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Ontario Regulation 278/05 does not require air monitoring clearance criteria for Type 1 or 2 operations, or for Type 3 outdoor operations, however, this requirement may vary in other Canadian jurisdictions. Also, many EACC members will proactively utilize the Type 3 air monitoring clearance methodology for Type 1 (Low Risk) operations and Type 2 (Moderate Risk). This may be useful to indicate a successful clean-up to occupants of the building.

It should be noted that aggressive air sampling (as performed for Type 3 clearance) is not appropriate for monitoring of sites where other dusts or debris may be present and some modification of the collection method will be required. The method utilized by the US EPA for monitoring residential accommodation in the areas affected by the World Trade Centre collapse is an appropriate method to consider.

World Trade Center Indoor Dust Cleaning Program Monitoring Contract Scope of Work

https://archive.epa.gov/wtc/web/pdf/confirmation_cleaning_study.pdf

We hope this document has been of assistance. Should you have any questions or comments regarding this document, please do not hesitate to contact EACC at 416-499-4000.

Disclaimer:

EACC disclaims any liability or risk resulting from the use of the work practices and recommendations discussed in this document. It is the user's responsibility to ensure that these apply to the specific workplaces and to ensure compliance with all other federal, provincial and local regulations that may be applicable.