Expanded Designated Substances Report - Update
Hagen Hall
115 Seraphin-Marion Private, Ottawa, Ontario
BCE Project Number 21-228

February 11, 2021

Prepared for: University of Ottawa

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EXECUTIVE SUMMARY

Buller Crichton Environmental Inc. (BCE) was retained by Francesco Nicolo of the University of Ottawa (Client), to provide an updated designated substance survey (DSS) and report for the Hagen Hall Building located at 115 Seraphin-Marion Private in Ottawa, Ontario (Site). The site survey was completed by BCE on May 20th, 2021.

The survey included an assessment for specified hazardous materials as well as assessment and sampling for eleven designated substances, as defined in Ontario Regulation 490/09: Designated Substances (O. Reg. 490/09) made under the Ontario Occupational Health and Safety Act, R.S.O. 1990 Chapter O.1, as amended, (OH&S Act). Substances surveyed included:

- Benzene
- Lead
- Acrylonitrile
- Isocyanates
- Silica
- Arsenic
- Coke Oven Emissions
- Asbestos
- Vinyl Chloride
- Mercury
- Ethylene Oxide

This report was prepared for the Client to fulfill the Duty of project owner’s requirement under Section 30 (1) of the OH&S Act; the requirements of Section 10 of Ontario Regulation 278/05: Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations, as amended (O. Reg. 278/05); and Ontario Regulation 490/09, s.19 (1) which indicates that an employer shall carry out an assessment of the exposure or likelihood of exposure of a worker to a designated substance in the workplace and record it in writing. This report must be provided to contractors prior to conducting demolition or renovation work at the Site.

For complete information and findings, as well as the limitations and recommendations, the reader should read the complete report.

See Appendix B for photo references.

See Appendix C for the Asbestos-Containing Materials Inventory.

See Appendix D for the Hazardous Materials Inventory.

See Appendix E for site plans.
Asbestos

Based on the results of the non-destructive visual assessment and historical sample analysis, the following asbestos-containing materials (ACMs) were identified or suspected to be present throughout the building:

<table>
<thead>
<tr>
<th>Building Material</th>
<th>Friable?</th>
<th>Location</th>
<th>Type of Asbestos</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drywall Joint Compound</td>
<td>No</td>
<td>Throughout Building</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>Vinyl Floor Tiles</td>
<td>No</td>
<td>Specified Areas Only</td>
<td>Chrysotile</td>
</tr>
<tr>
<td>Ceiling Tiles</td>
<td>No</td>
<td>Specified Areas Only</td>
<td>Amosite</td>
</tr>
<tr>
<td>Fire Door</td>
<td>Yes*</td>
<td>Specified Areas Only</td>
<td>Presumed</td>
</tr>
<tr>
<td>Roofing Material</td>
<td>No*</td>
<td>Roof</td>
<td>Presumed</td>
</tr>
</tbody>
</table>

*material assumed to contain asbestos until proven otherwise by means of material specific analysis by PLM.

Please refer to Table 1, Table 2, and Appendix C for further details on ACM concentrations and locations.

Lead

Based on the results of the non-destructive visual assessment and historical sample analysis, multiple paint finishes throughout the building contain concentrations of lead above the Environmental Abatement Council of Canada (EACC) Lead Guideline for Construction, Renovation, Maintenance or Repair guideline limit of less than or equal to 0.1% lead by weight (1,000 μg/g). Please refer to Table 3 and Appendix D for further details on lead concentrations and locations.

In addition, the following materials, where found, should be considered to contain lead:
- Cast iron pipe fitting caulking,
- Lead acid batteries,
- Electrical components, including wiring connectors, grounding conductors, and solder,
- Solder on pipe connections,
- Mortars, and
- Ceramic tile glazing.

Mercury

Mercury is expected to present in the fluorescent light tubes and thermostats observed at the Site. Caution should be exercised to ensure these materials are not broken during renovations, releasing droplets of mercury. Please refer to section 4.3 and Appendix D for further details on locations.

There is no occupational or environmental concern associated with mercury in its current state and condition. However, when the buildings are renovated the fluorescent lights and fixtures must be

### Silica

Suspected silica-containing materials were not physically sampled during the DSS as they are known to be present in drywall, concrete, plaster, bricks, mortar and any other aggregates.

### Ozone Deplete Substances (ODSs)

Refrigerators, freezers, water fountains, water coolers, etc. which contain or are suspected of containing ODSs have previously been identified throughout the subject building. Please refer to section 4.5.2 and Appendix D for further details on locations.

### Mould/Water Damage

No obvious signs of mould were identified; however, water damage was noted in specified areas. Please refer to section 4.5.5 and Appendix D for further details on locations.

### Other Designated Substances & Hazardous Materials

No other designated substances, as defined in O. Reg. 490/09 under the OH&S Act, or Hazardous Materials were observed at the Site.

Although BCE assessed all physically accessible areas, including destructive techniques, the possibility still exists that concealed materials may be found during any renovation or demolition process.

In the event any additional suspect designated substances are encountered during renovation or demolition activities, work on those materials must stop immediately and remain undisturbed until testing confirms the presence or absence of asbestos or other designated substances.
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1 INTRODUCTION
Buller Crichton Environmental Inc. (BCE) was retained by Francesco Nicolo of the University of Ottawa (Client), to provide an updated designated substance survey (DSS) and report for the Hagen Hall Building located at 115 Seraphin-Marion Private in Ottawa, Ontario (Site). The site survey was completed by BCE on May 20th, 2021.

2 SITE DESCRIPTION
The subject building is a three-storey institutional building, covering approximately 17,200 square feet and constructed circa 1931. The subject building was observed to be constructed with a concrete slab floor, exterior walls, and roof deck. The interior walls were gypsum wallboard and concrete block with plaster. Ceilings were observed to be either suspended ceiling tiles or plaster. The floors generally consisted of terrazzo, vinyl floor tiles, ceramic tiles, vinyl sheet flooring, laminate wood, and carpet.

3 SCOPE OF WORK
BCE’s scope of services can be found in Appendix A.

4 RESULTS AND DISCUSSION
Based on the review of previous reports, visual assessment and historical sampling, the following is a summary of the results.

4.1 Asbestos-Containing Materials
A summary of the materials previously sampled for asbestos is presented in Table 1 below. Sample references for historical data can be cross referenced to the reports listed in Appendix A. Sample locations of materials collected during the current assessment can be found in Appendix C.

<table>
<thead>
<tr>
<th>Sample Reference per Section 3.0 of this Report</th>
<th>Location</th>
<th>Material Description</th>
<th>Results</th>
<th>Friable (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>1st and 2nd level</td>
<td>Drywall Joint Compound</td>
<td>2% CH</td>
<td>N</td>
</tr>
<tr>
<td>a</td>
<td>Room 100, 104D, 106, 200A,</td>
<td>Suspended Ceiling Tile (SCT) - 2’x4’ white w/ small pinholes</td>
<td>2% AM</td>
<td>N</td>
</tr>
<tr>
<td>a</td>
<td>Room 306</td>
<td>Vinyl Floor Tile (VFT) - 12”x12” - Gold w/ White Streaking</td>
<td>9.8% CH</td>
<td>N</td>
</tr>
<tr>
<td>a</td>
<td>Room 107J</td>
<td>VFT - 12”x12” - Grey w/ Streaks</td>
<td>2% CH</td>
<td>N</td>
</tr>
<tr>
<td>a</td>
<td>Room 107G and 107J</td>
<td>VFT - 12”x12” - Grey and Brown</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>a</td>
<td>Room 107K</td>
<td>12”x12” - Beige w/ Black Specks</td>
<td>ND</td>
<td>N/A</td>
</tr>
</tbody>
</table>
The following building materials (if present) have previously been investigated for asbestos content:

<table>
<thead>
<tr>
<th>Sample Reference per Section 3.0 of this Report</th>
<th>Location</th>
<th>Material Description</th>
<th>Results</th>
<th>Friable (Y/N)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a Room 107K</td>
<td>Room 107K</td>
<td>Vinyl base boards (black)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>a Room 107</td>
<td>Room 107</td>
<td>Vinyl base boards (beige)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>a Room 107B</td>
<td>Room 107B</td>
<td>Window Caulking (black)</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>a Room 100, 104D, 105, 106, 207A, 305, 307 (7 Samples)</td>
<td>Room 100, 104D, 105, 106, 207A, 305, 307 (7 Samples)</td>
<td>Grey Wall Plaster</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>a Room 200, 207, 305 (7 Samples)</td>
<td>Room 200, 207, 305 (7 Samples)</td>
<td>Grey Ceiling Plaster</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>a Room 207, 305 (3 Samples)</td>
<td>Room 207, 305 (3 Samples)</td>
<td>White Ceiling Plaster</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>a Room 201C (3 Samples)</td>
<td>Room 201C (3 Samples)</td>
<td>VFT - 12”x12” Cream w/ Dark Streaks</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>a Room 208 (3 Samples)</td>
<td>Room 208 (3 Samples)</td>
<td>Vinyl Sheet Flooring (VSF), Beige</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>a Room 210 (3 Samples)</td>
<td>Room 210 (3 Samples)</td>
<td>VSF - Dark Brown w/ Light &amp; Dark Streaks</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>b Washroom 106A &amp; 101A (3 samples)</td>
<td>Washroom 106A &amp; 101A (3 samples)</td>
<td>Wall Plaster – White Surface Layer</td>
<td>ND</td>
<td>N/A</td>
</tr>
<tr>
<td>b Washroom 106A &amp; 101A (3 samples)</td>
<td>Washroom 106A &amp; 101A (3 samples)</td>
<td>Yellow Ceramic Tile Adhesive</td>
<td>ND</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Bolded information indicated material is asbestos-containing.

CH = Chrysotile Asbestos
AM = Amosite Asbestos
ND = No asbestos detected in sample
NA = Not applicable as material is not asbestos-containing

Note: If additional materials suspected to contain designated substances that were not previously visible / uncovered are encountered during any renovation or demolition activities that are not included in this report, work must be stopped, and further investigation be conducted at that time. Further investigation may include retaining the services of an environmental consulting firm to assess the material and samples as per O. Reg. 278/05. In the case that suspected ACMs cannot be tested, they must be treated as ACMs until proven otherwise.

Please refer to Appendix C – Asbestos-Containing Materials Inventory for material conditions, approximate quantities (where applicable), and recommended actions.
4.1.1 Spray Applied Fireproofing

No spray applied fireproofing was observed in the subject building.

4.1.2 Mechanical Pipe Insulation

4.1.2.1 Mechanical Pipe Straight Insulation
Previous surveys have indicated all accessible mechanical pipe straight insulation as fiberglass, and therefore not suspected of containing asbestos.

4.1.2.2 Mechanical Piping Elbows/Fittings Insulation
Previous surveys have indicated all accessible mechanical piping elbows and fittings insulation as fiberglass, and therefore not suspected of containing asbestos.

4.1.2.3 Mechanical Piping Hangers Insulation
No mechanical pipe hanger insulation was observed in the subject building.

4.1.2.4 HVAC Duct Insulation
Previous surveys have indicated all accessible HVAC duct insulation as fiberglass, and therefore not suspected of containing asbestos.

4.1.2.5 Other Mechanical Insulation
No other mechanical insulation was previously observed in the subject building.

4.1.3 Flexible Duct Connector
No flexible duct connectors were previously observed in the subject building.

4.1.4 Heat Shield or Heat Shield Insulation
No potential heat shield or heat shield insulation were previously observed in the subject building.

4.1.5 Plaster
Wall plaster (white surface layer and grey base layer) was observed and previously sampled from Room 100, 104D, 105, 106, 2017A, 305, and 307. The laboratory analytical results of the plaster samples collected indicated that this material does not contain asbestos.

Ceiling plaster was observed and previously sampled from Rooms 200, 207, and 305. The laboratory analytical results of the samples collected indicated that this material does not contain asbestos.
4.1.6 **Drywall Joint Compound**

Drywall joint compound was observed throughout the subject building and previously sampled from the 1st and 2nd level. The laboratory analytical results of the drywall joint compound samples collected indicated that this material does not contain 2% *chrysotile asbestos*.

Since drywall joint compound is a homogeneous material, **all drywall joint compound must be treated as asbestos-containing** unless delineation and additional bulk sampling and analysis proves otherwise. This material was observed to be in good condition with the exception of select areas that were observed in poor condition.

4.1.7 **Ceiling Tiles**

Several different types of ceiling tiles have previously been sampled within the subject building as follows:

- Suspended ceiling tiles (2’x4’ pinholes w/ small fissures) were previously observed throughout the 1st level. The date stamp on the back of these tiles indicated that they were manufactured in 2006 and therefore, this material is not considered to contain asbestos.
- Suspended ceiling tiles (2’x4’ white w/ small pinholes) were observed within Rooms 100, 104D, 106, 200A. This material contains 2% *amosite asbestos*. This non-friable material was observed in good condition.

4.1.8 **Vinyl Floor Tiles**

Several different types of vinyl floor tiles were observed and previously sampled within the subject building as follows:

- Previously identified asbestos-containing vinyl floor tiles (12”x12” – Grey w/ Streaks) were observed in Room 107J. This material contains 2% *chrysotile asbestos* and is considered to be non-friable. This material was observed to be in good condition.
- Vinyl floor tiles (12”x12”-Cream with Dark Streaks) were observed and previously sampled in Room 201C. The laboratory analytical results of the vinyl floor tile samples collected indicate that this material does not contain asbestos. The associated levelling compound (Grey) was also found not to contain asbestos.
- Vinyl floor tiles (12”x12”- Grey and Brown) were previously sampled in Room 107G and 107J. The laboratory analytical results of the samples collected indicated that this material does not contain asbestos.
- Vinyl floor tiles (12”x12”- Beige w/ Black Specks) were previously sampled in Room 107K. The laboratory analytical results of the vinyl floor tile samples collected indicated that this material does not contain asbestos.
4.1.9 Vinyl Sheet Flooring
Several different types of vinyl sheet flooring were observed and previously sampled within the subject building as follows:

- Vinyl sheet flooring (Beige) was observed and previously sampled in Room 208. The laboratory analytical results of the vinyl sheet flooring samples collected indicate that this material does not contain asbestos. The associated mastic/backing material (Yellow) was also found not to contain asbestos.
- Vinyl sheet flooring (Dark Brown w/ Light & Dark Streaks) was observed and previously sampled in Room 210. The laboratory analytical results of the vinyl sheet flooring samples collected indicate that this material does not contain asbestos. The associated mastic/backing material (Yellow) was also found not to contain asbestos.

4.1.10 Vinyl Base Boards
Several different types of vinyl base boards were observed and previously sampled within the subject building as follows:

- Vinyl base boards (Black) were previously sampled in Room 107K. The laboratory analytical results of the vinyl base board samples collected indicated that this material does not contain asbestos.
- Vinyl base boards (Beige) were previously sampled in Room 107. The laboratory analytical results of the vinyl base board samples collected indicated that this material does not contain asbestos.

4.1.11 Caulking
Window caulking (Black) was previously sampled in Room 107B. The laboratory analytical results of the window caulking samples collected indicated that this material does not contain asbestos.

4.1.12 Transite (Asbestos Cement)
No transite materials were previously observed in the subject building.

4.1.13 Cementitious Coating
No cementitious coating finishes were previously observed in the subject building.

4.1.14 Fire Doors
Fire doors were previously observed at various locations throughout the subject building. To avoid possible damage, no bulk samples of the internal door insulation materials were collected. Prior to removal and/or replacement, fire doors should be examined and tested for asbestos content. Fire doors should be considered to contain asbestos until bulk samples and analysis proves otherwise. All fire doors were observed to be in good condition.
4.1.15 Roofing Material
To avoid damage and compromising the integrity of roofing material, no bulk samples of the roofing materials were collected. Prior to removal and/or replacement, roofing materials should be examined and tested for asbestos content. Roofing materials should be considered to contain asbestos until bulk samples and analysis proves otherwise.

4.1.16 Recommendations
- Although not identified during the site visit, any future asbestos-containing materials identified to be in poor condition must be repaired/removed immediately, following work procedures as detailed in O. Reg. 278/05 and disposed of as asbestos waste under O. Reg. 347;
- Although not identified during the site visit, any future asbestos-containing materials identified to be in fair condition should be scheduled to be repaired/removed. Timeline for repair/removal is dependent on the potential risk of exposure to worker and/or occupants;
- Materials identified to contain asbestos that are in good condition can be managed in place. Prior to renovation/demolition activities that may disturb the ACMs, these materials must be removed following work procedures as detailed in O. Reg. 278/05 and disposed of as asbestos waste under O. Reg. 347;
- Prior to renovation/demolition of materials which are assumed to be asbestos-containing (roofing materials, fire doors, etc.), these materials must either be tested for asbestos content or removed in accordance with O. Reg. 278/05 and disposed of as asbestos waste under O. Reg. 347;
- Please refer to Appendix C – Asbestos-Containing Materials Inventory for material conditions, approximate quantities (where applicable), and recommended actions;
- Asbestos containing waste must also be handled and disposed of according to O. Reg. 347/90. Any suspect building materials encountered that were not assessed as part of this survey, should be assumed to contain asbestos until proven otherwise by analytical testing;
- This report must be provided to contractors prior to conducting demolition or renovation work at the Site. A copy of the DSR must be immediately available at the Site whenever workers are present. Further, contractors shall have an exposure control plan in place for each designated substance identified in this report as being in way of the planned work.
- Since ACMs are present within the building, an Asbestos Management Plan (AMP) is required, and an inventory of ACMs must be kept on site. All ACMs must be routinely inspected to ensure no damage has occurred, and the inventory must be updated once in each 12-month period;
- Update the asbestos inventory upon completion of the abatement and removal of asbestos-containing materials.
Table 2 provided below outlines the removal / management requirements / options.

<table>
<thead>
<tr>
<th>Asbestos Containing Material (ACM)</th>
<th>ACM Location</th>
<th>Recommendations</th>
</tr>
</thead>
</table>
| Drywall Compound                  | Throughout Building | 1) Type 1 precautions if less than 1 m² is removed.  
OR  
2) Type 2 precautions if greater than 1 m² is removed.  
OR  
3) Type 3 precautions if material is removed with power tools. |
| Suspended Ceiling Tile (SCT) - 2’x4’ white w/ small pinholes | Room 100, 104D, 106, 200A | 1) Remove following Type 1 precautions if less than 7.5 m² are removed or disturbed without being broken, cut, drilled, abraded, ground, sanded or vibrated.  
OR  
1) Remove following Type 2 precautions if greater than 7.5 m² are removed or disturbed without being broken, cut, drilled, abraded, ground, sanded or vibrated. |
| Vinyl Floor Tile                  | Room 107J    | 1) Remove following Type 1 precautions if removed or disturbed with hand tools and the materials are wetted.  
OR  
2) Type 2 precautions if removed or disturbed with power tools equipped with a HEPA filtered dust collection system.  
OR  
3) Type 3 precautions if the work is completed with power tools not equipped with HEPA filtered dust collection system. |
| Fire doors (presumed)             | Throughout Building | Prior to removal, it must be sampled, and verified whether the material is friable or non-friable. This determination will dictate the proper abatement protocols to satisfy O. Reg 278/05. |
| Roofing Materials (presumed)      | Throughout Building | Prior to removal, it must be sampled, and verified whether the material is friable or non-friable. This determination will dictate the proper abatement protocols to satisfy O. Reg 278/05. |
If the ACM is to remain, manage in accordance with Section 8 of O. Reg. 278 / 05.

4.2 Lead-Containing Materials

A summary of the materials previously sampled for lead for the purpose of this survey is presented in Table 3 below. Sample references for historical data can be cross referenced to the reports listed in Section 3.0 Scope of Work.

<table>
<thead>
<tr>
<th>Sample Reference per Section 3.0 of this Report</th>
<th>Location</th>
<th>Material Description</th>
<th>Results (µg/g)</th>
</tr>
</thead>
<tbody>
<tr>
<td>a</td>
<td>Room 200</td>
<td>White Ceiling Paint</td>
<td>900</td>
</tr>
<tr>
<td>a</td>
<td>Room 200</td>
<td>Light Purple Column Paint</td>
<td>300</td>
</tr>
<tr>
<td>a</td>
<td>Room 305</td>
<td>White Window Frame Paint</td>
<td>27,000</td>
</tr>
<tr>
<td>a</td>
<td>Room 305</td>
<td>Brown/Green Door Paint</td>
<td>500</td>
</tr>
<tr>
<td>a</td>
<td>Room 310</td>
<td>Black Railing Paint</td>
<td>4,000</td>
</tr>
<tr>
<td>a</td>
<td>Room 100</td>
<td>Beige Wall Paint</td>
<td>100</td>
</tr>
<tr>
<td>a</td>
<td>Room 100</td>
<td>Blue Door Paint</td>
<td>400</td>
</tr>
<tr>
<td>a</td>
<td>Room 106A</td>
<td>Yellow Stalls &amp; Countertop Paint</td>
<td>72,000</td>
</tr>
<tr>
<td>b</td>
<td>Room 106A</td>
<td>Beige Wall Paint on Concrete Block</td>
<td>&lt;20</td>
</tr>
<tr>
<td>b</td>
<td>Room 106A</td>
<td>Ceramic Tile Glazing</td>
<td>&lt;1</td>
</tr>
<tr>
<td>b</td>
<td>Room 101A</td>
<td>Beige Wall Paint on Plaster</td>
<td>&lt;20</td>
</tr>
</tbody>
</table>

- Paint finishes highlighted in blue were determined to contain low concentrations of lead (<1000 µg/g).
- Paint finishes highlighted in pink were determined to contain high concentrations of lead (>1000 µg/g).

All other paints throughout the building not mentioned in this report must be considered to be lead-containing until project specific sampling proves otherwise.

4.2.1 Battery Packs

Battery packs suspected of containing lead were previously identified in throughout the subject building on walls and above exits.

The following materials, where found, should be considered to contain lead:
- Cast iron pipe fitting caulking;
- Electrical components, including wiring connectors, grounding conductors, and solder;
- Solder on pipe connections;
- Ceramic tile glazing; and
- Mortars.
4.2.3 Recommendations

- Please refer to Appendix D – Hazardous Materials Inventory for material conditions, approximate quantities (where applicable), and recommended actions.
- Although not identified during the site visit, any future paints identified to contain lead that are in poor condition must be immediately repaired and/or stabilized following a minimum Type 1/2 lead abatement procedures as per Ministry of Labour, Training and Skills Development Guidelines – Lead on Construction Projects, 2011.
- Although not identified during the site visit, any paints identified to contain lead that are in fair condition should be either repaired (where possible) and/or closely monitored for signs of further deterioration.
- Paints identified to contain lead that are in good condition and do not pose a risk to workers or occupants can be managed in place.
- Prior to renovation/demolition of materials not mentioned in this report must be considered to be lead-containing until project specific sampling proves otherwise.
- This report must be provided to contractors prior to conducting demolition or renovation work at the Site. A copy of the DSR must be immediately available at the Site whenever workers are present. Further, contractors shall have an exposure control plan in place for each designated substance identified in this report as being in way of the planned work.
- Although construction site projects are exempt from the requirements of Ontario Regulation 490/09 and Ontario Regulation 833, the general duty requirements under Occupational Health and Safety Act, employers are still required to do everything reasonable and practicable to protect workers from workplace hazards. Maintaining worker exposure within the prescribed air borne occupational exposure levels is considered best management practice for construction workers. These include:
  - The OEL-TWA of a worker to lead is to be maintained at the lowest practical level with a view to achieving an ambient air concentration lower than 0.05 mg/m³ of air.
  - To achieve the above, the following recommendations are made with respect to lead at the Site.
  - All work should be completed with procedures as described in the Ministry of Labour, Training and Skills Development Guidelines Lead on Construction Projects, 2011.
  - All work should be completed with procedures as described in the EACC Lead Guideline for Construction, Renovation, Maintenance or Repair.
  - This guideline establishes a de minimis (i.e. virtually safe) level of lead in paint or surface coatings where a hazard would not likely be present. Lead content of 0.1% (i.e. 1000 μg/g or 1000 mg/kg or 1000 ppm lead) is considered a de minimis level of lead in paint or surface coatings, provided that aggressive disturbance or heating does not occur. This applies to tasks that do not create excessive or significant dust, mist or fume. Tasks that generate significant dust, mist or fume are excluded.
and always require adherence to Class 2 or Class 3 operations or require an exposure assessment.

- Alternatively, a hygiene or exposure assessment can be performed to determine procedures that are required. This assessment requires an understanding of what methods will be used to disturb the paint.
  - All workers present on site during demolition activities should be trained against the hazards of lead exposure and provided with a respirator with P-100 High Efficiency Particulate Air (HEPA) filtration that is personally fit tested to the worker wearing it.
    - Water and ventilation should be used to keep dust levels to a minimum.
    - The work area should be isolated with banner tape warning of the hazards of lead exposure. Workers within this isolated work area should be wearing the required personal protective equipment.
    - No dry sweeping or use of compressed air should be use during clean-up activities. Instead, HEPA filtered vacuums and wet sweeping should be used.
    - Workers should wash their hands and face prior to leaving Site to avoid the spread of lead dust and continued inhalation when not on Site.
  - All waste material must be handled and disposed of according to the Revised Regulation of Ontario 347/90 as amended – made under the Environmental Protection Act. Lead waste generated may also be subject to Leachate Criteria (Schedule 4) of this regulation.

4.3 Mercury

Findings

4.3.1 Thermostat Switches
Thermostat switches suspected of containing mercury were previously identified throughout the subject building.

4.3.2 Fluorescent Light Tubes
Fluorescent light fixtures throughout the surveyed area were previously identified as containing 2 to 4 fluorescent light tubes per fixture. Mercury is likely to be present in vapor form in the fluorescent light tubes. The fluorescent lights were observed to be manufactured by Alto.

Recommendations
- Please refer to Appendix D – Hazardous Materials Inventory for equipment conditions, approximate quantities (where applicable), and recommended actions.
- Caution should be exercised to ensure light tubes, or switches are not broken during renovations, releasing droplets of mercury. There is no occupational or environmental concern associated with mercury in its current state and condition.
• Exposure to mercury is regulated under Ontario Regulation 490/09, Designated Substances – made under the Occupational Health and Safety Act.
• Best management practices dictate that the mercury containing fixtures must be returned to a participating recycling centre or picked up and disposed of by a licensed hazardous materials contractor of in accordance with R.R.O. 1990, Regulation 347 General – Waste Management, made under the Environmental Protection Act.
• Ensure personnel have been trained in accordance with Workplace Hazardous Materials Information System (WHMIS) requirements.

4.4 Silica

Findings

• Silica has not been physically sampled previously as it would cause damage to the Site. Silica is presumed to be present in the concrete, drywall, ceiling tiles, masonry, and mortars used to construct the Site. Silica-containing materials were observed to be in good condition at the time of the assessment. There is no occupational or environmental concern associated with materials pertaining to silica in its current state and condition.

Recommendations

• Please refer to Appendix D – Hazardous Materials Inventory for material conditions, approximate quantities (where applicable), and recommended actions.
• This report must be provided to contractors prior to conducting demolition or renovation work at the Site. A copy of the DSR must be immediately available at the Site whenever workers are present. Further, contractors shall have an exposure control plan in place for each designated substance identified in this report as being in way of the planned work.
• Although construction site projects are exempt from the requirements of Ontario Regulation 490/09 and Ontario Regulation 833, the general duty requirements under Occupational Health and Safety Act, employers are still required to do everything reasonable and practicable to protect workers from workplace hazards. Maintaining worker exposure within the prescribed air borne occupational exposure levels is considered best management practice for construction workers. These include:
  o The Occupational Exposure Limit – Time Weighted Average (OEL-TWA) of a worker to silica dust is to be maintained at the lowest practical level with a view to achieving an ambient air concentration lower than 0.10 mg/m³ of air for quartz and Tripoli, and 0.05 mg/m³ of air for cristobalite and tridynite.
  o To achieve the above, the following recommendations are made with respect to silica at the Site.
- All work should be completed with procedures as described in the Ministry of Labour, Training and Skills Development Guidelines Silica on Construction Projects, 2011.
- All workers present on site during demolition activities should be trained against the hazards of silica exposure and provided with a respirator with P-100 High Efficiency Particulate Air (HEPA) filtration that is personally fit tested to the worker wearing it.
- Water and ventilation should be used to keep dust levels to a minimum.
- The work area should be isolated with banner tape warning of the hazards of silica exposure. Workers within this isolated work area should be wearing the required personal protective equipment.
- No dry sweeping or use of compressed air should be used during clean-up activities. Instead, HEPA filtered vacuums and wet sweeping should be used.
- Workers should wash their hands and face prior to leaving Site to avoid the spread of silica dust and continued inhalation when not on Site.

4.5 Other Hazardous Materials

4.5.1 Polychlorinated Biphenyls (PCBs)

*Findings*

*Light Ballasts*

The subject building is illuminated by LED and fluorescent lights. Previous assessments have been completed of representative ballasts in the building, and these ballasts were identified as non-PCBs content.

*Transformers*

Previous assessments have not observed any PCB-containing electrical transformers within the subject building. Transformers that could be assessed were observed to be dry-type and manufactured by Hammond Manufacturing.

*Recommendations*

Since no PCB-containing equipment has previously been observed or suspected to be present during the site survey, no further action is required.
4.5.2 Ozone Depleting Substances (ODSs) and Other Halocarbon

**Findings**
Previous visual assessments for equipment potentially containing ODSs and other halocarbons has been conducted. Equipment such as refrigerators, freezers, water fountains, water coolers, etc. were observed, which contain or are suspected of containing ODSs or other halocarbons.

No other equipment containing ODSs or other halocarbons was observed in the subject building.

**Recommendations**
Please refer to Appendix D – Hazardous Materials Inventory for equipment conditions, approximate quantities (where applicable), and recommended actions.

Under the management of a licensed contractor, equipment containing R134A does not represent a significant threat to human health or the environment however, a licensed contractor must decommission equipment such that CFCs are contained and not released to the environment during servicing or operation.

4.5.3 Radioactive Materials

**Findings**
Previous assessments have not observed any electrical equipment suspected of containing radioactive materials in the subject building.

**Recommendations**
Since no radioactive materials were observed or suspected to be present during the site survey, no further action is required.

4.5.4 Underground and Above Ground Storage Tanks (USTs and ASTs)

**Findings**
Previous visual surveys of the subject building were conducted to determine if any USTs and ASTs were present. NO USTs and ASTs were present within the surveyed area.

**Recommendations**
Please refer to Appendix D – Hazardous Materials Inventory for equipment conditions, approximate quantities (where applicable), and recommended actions.
Since no underground and/or above ground storage tanks (USTs and ASTs) were observed or suspected to be present during the site survey, no further action is required.

4.5.5 Mould

Findings

4.5.5.1 Mould
A visual survey of the subject building was conducted to determine if any mould was present. BCE did not observe any areas with obvious signs of visible mould growth.

4.5.5.2 Water Damage
A visual survey of the subject building was conducted to determine if any water damaged was present. BCE identified selected locations throughout the building where materials were affected by water damage.

Recommendations
Please refer to Appendix D – Hazardous Materials Inventory for equipment conditions, approximate quantities (where applicable), and recommended actions.

Water stained/damaged building materials observed throughout the subject building should be replaced/repaired as part of regular maintenance and the underlying cause of the water leakage should be identified and repaired

4.6 Other Designated Substances
The following Designated Substances do not require any action and are not addressed in this section:

- Benzene
- Vinyl Chloride
- Acrylonitrile
- Ethylene Oxide
- Arsenic
- Isocyanate
- Coke Oven Emissions

5 LIMITATIONS
This report was prepared for the exclusive use of the Client. This report is based on data and information collected during the Site visit conducted May 20th, 2021 by BCE Inc. as described in this report.

The conclusions and recommendations contained in this report are based upon professional opinions regarding the subject matter. These opinions are in accordance with currently accepted environmental assessment standards and practices applicable to these locations and are subject to the following inherent limitations:
The data and findings presented in this report are valid as of the date of the investigation. The passage of time, manifestation of latent conditions or occurrence of future events may warrant further exploration at the properties, analysis of the data, and re-evaluation of the findings, observations, and conclusions expressed in this report.

The findings, observations and conclusions expressed by BCE in this report are not, and should not be considered, an opinion concerning compliance of any past or present owner or operator of the building with any federal, provincial or local laws or regulations.

Additional Designated Substances not identified in this report may become evident during demolition activities. Should additional information become available, BCE requests that this information be brought to our attention so that we may re-assess the conclusions presented herein. All quantities contained in this report are approximate and based on visual observations made in accessible areas.

Although effort was made to expose and sample potential designated substances, there is a possibility that additional concealed substances/materials may be present beneath existing flooring, behind wall cavities, roof systems, above ceilings, and any other inaccessible areas such as pipe chases at the Site.

Should further designated substances be encountered during any renovation or demolition activities, those materials must be managed in accordance with applicable regulations.

6 CLOSURE
If you have any questions or require any further information, please feel free to contact the undersigned. Thank you for the opportunity to be of service. We look forward to working with you again.

BULLER CRICHTON ENVIRONMENTAL INC.

Prepared By: 

Reviewed By:

Emily Morgan, HB.Sc. 
Environmental Health and Safety Technician

Derek Stashick, B.Ed, WRT, CMI
Senior Project Manager
APPENDIX A:
Scope of Work, Regulatory Requirements, Methodology & Background Information
SCOPE OF WORK

BCE’s scope of services was limited to the following:

1. Reviewing the Site to identify any building materials suspected of containing designated substances and hazardous materials and noting their condition.
2. BCE also reviewed the following reports prior to the site assessment:
3. Collecting samples of accessible building materials that are suspected to contain asbestos and lead for laboratory analysis by an independent, third-party accredited laboratory if requested and/or deemed necessary.
4. Providing a comprehensive summary report of designated substances identified at the Site with recommendations for removal and/or management as required.

REGULATIONS and GUIDELINES

Designated Substances – Ontario Regulation 490/09

Ontario Regulation 490/09 (O. Reg. 490/09): Designated Substances under the Act lists/defines the Designated Substances and provides the associated exposure limits:

- Benzene
- Lead
- Acrylonitrile
- Isocyanates
- Silica
- Arsenic
- Coke Oven Emissions
- Asbestos
- Vinyl Chloride
- Mercury
- Ethylene Oxide

It should be noted that Section 14 of O. Reg. 490/09 indicates that the regulation does not apply to:

a) To an employer who engages in construction; or
b) To the workers of an employer described in clause (a) who are engaged in construction.

O. Reg. 490/09 does not apply to construction; however, it is frequently referenced as defining Designated Substances. The exposure limits presented in O. Reg. 490/09 are consistent with exposure limits presented in Ontario Regulation 833 – Control of Exposure to Biological or Chemical Exposure (O. Reg 833), which in recent amendments, no longer excludes construction.

Designated Substances - OH&S Act, R.S.O. 1990, c. O.1

Section 30 of the OH&S Act requires that a document summarizing the presence of these designated substances must be available to contractors and subcontractors requesting tenders, prior to
beginning a construction project (including building renovation or demolition). This report serves that purpose. However, scaled drawings and contract specifications are still required on a project-by-project basis.

Asbestos

Ontario Regulation 278/05 – Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations (O. Reg. 278/05) made under the OH&S Act, outlines specific procedures for identifying asbestos in buildings and on construction sites. In addition, it outlines requirements for their removal and / or re-assessment and management depending on whether any identified materials are to remain in the building. ACM in good condition can remain in the building if it is managed as prescribed in this regulation, including but not limited to implementation of an Asbestos Management Plan (AMP), annual condition assessment, notification to tenants and training for specified workers. However, any asbestos-containing materials (ACM) must be removed prior to disturbance as a result of renovations and / or demolition of the Site.

R.R.O. 1990, Regulation 347 General – Waste Management as amended (O. Reg. 347/90), made under the Ontario Environmental Protection Act, R.S.O. 1990, Chapter E.19, as amended (“EPA”) sets out requirements for general waste management including ACM. This regulation requires the disposal of asbestos waste in double sealed containers (e.g., a six-mil (0.15 mm) polyethylene bag or hard plastic barrel), properly labelled and free of cuts, tears, or punctures. The waste must be disposed of in a licensed waste facility which has been properly notified of the presence of asbestos waste.

Lead

O. Reg. 490/09, as amended regulates lead exposure in the work environment. Apart from construction sites, this regulation is enforceable at all work sites in Ontario. Lead on construction sites is regulated through O. Reg 833 as well as through the Ministry of Labour, Training and Skills Development (MLTSD) Guideline – Lead on Construction Projects (revised in April 2011) and enforceable through section 25 (2) (h) of the OH&S Act.

Disposal of lead must be conducted in accordance with the requirements of Reg. 347 General – Waste Management. The regulation details the minimum requirements for the appropriate transport and disposal of wastes, including acceptable Leachate Quality Criteria (Toxicity Characteristic Leaching Procedure – TCLP).

Environmental Abatement Council of Canada (EACC) Lead Guideline for Construction, Renovation, Maintenance or Repair is intended for the environmental abatement industry, construction industry and the painting industry in general.

Various occupational and workplace safety authorities and agencies consider that, depending on the type of disturbance, airborne lead could be generated in hazardous levels from any amount of lead in a paint or surface coating. As such, these agencies have not set a level of lead in paint at which lead-related precautions are not required (a de minimis level).

Similarly, there is no established concentration of lead below which lead procedures are not required if a lead-containing material is disturbed. However, the EACC guideline establishes a de minimis (i.e., virtually safe) level of lead in paint or surface coatings where a hazard would not likely be present.
For the purpose of this guideline, paints or surface coatings containing less than or equal to 0.1% lead by weight (1000 μg/g) are considered low-level lead paints or surface coatings. If these materials (and the surfaces to which they are applied) are disturbed in a non-aggressive manner, performed using normal dust control procedures and are completed so that the time-weighted average (TWA) for Particles Not Otherwise Specified (PNOS) is not exceeded, then worker protection from the inhalation of lead is not required.

General health and safety precautions must still be implemented, which may include, in part, prohibiting eating, drinking, smoking and chewing in the work area, implementing dust suppression techniques and washing facilities for workers to wash hands and face. In terms of requirements associated with the specialized removal, the National Master Specification (NMS) format is to be followed as well as applicable industry standard, including procedures described in the Ministry of Labour Guidelines – Lead on Construction Projects, 2011 and the EACC Lead Guideline. In summary, worker training and containment of work areas must be completed as classified by the EACO, including Class 1, Class 2A, Class 2B, Class 3A and Class 3B Operations.

**Mercury**

O. Reg. 490/09, as amended regulates mercury exposure in the work environment. Except for construction sites, this regulation is enforceable at all work sites in Ontario. Mercury on construction sites is regulated through O. Reg 833.

Disposal of materials containing mercury shall be done in accordance with O. Reg. 347/90.

**Silica**

O. Reg. 490/09, as amended regulates silica exposure in the work environment. Except for construction sites, this regulation is enforceable at all work sites in Ontario. Exposure to silica on construction sites can happen through the inhalation of dust created from the disturbance of concrete, drywall, ceiling tiles, mortars etc. As a result, airborne exposure to silica on construction sites is regulated through O. Reg 833. In addition, the Ministry of Labour, Training and Skills Development (MLTSD) Guideline – Silica on Construction Projects (revised in April 2011) outlines ways to reduce exposure and protect workers on construction sites. This guideline is enforceable through section 25 (2) (h) of the OH&S Act.

**Polychlorinated Biphenyls (PCBs)**

Polychlorinated Biphenyls (PCBs) were commonly used as dielectric insulating fluid in electrical equipment such as transformers and capacitors, and in the fluorescent and HID lamp ballasts. The production of PCBs in the North America began in 1929 but was banned in 1979. After 1981, no manufacturers produced fluorescent and HID lamps with PCB-containing ballasts.

Please note that PCBs are not considered to be a designated substance under the Occupational Health and Safety Act.
The PCB Regulations (SOR/2008-273) set specific deadlines for ending the use of PCBs in concentrations at or above 50 mg/kg, eliminating all PCBs and equipment containing PCBs currently in storage and limiting the period of time PCBs can be stored before being destroyed. The Regulations also establish sound practices for the better management of the remaining PCBs in use (i.e. those with content of less than 50 mg/kg), until their eventual elimination, to prevent contamination of dielectric fluids and dispersion of PCBs in small quantities into other liquids.

**Ozone Depleting Substances (ODSs) and Other Halocarbons**

Within Ontario, ozone depleting substances (ODSs) and other halocarbons is controlled through Regulation 463/10 of the Environmental Protection Act. Production of ODSs in the form of hydrochlorofluorocarbons (HCFCs) and chlorofluorocarbons (CFCs) was halted in Canada in 1993 as a result of their ozone-depleting characteristics. Importing CFCs into Canada stopped in 1997 and total ban was placed on CFCs in 2010. The use of these materials is still permitted in existing equipment, but equipment must be serviced by a licensed contractor such that CFCs are contained and not released to the environment during servicing or operation.

**Radioactive Materials**

There are two types of smoke detectors commonly found in building (residential, institutional, commercial, industrial, etc). Photoelectric-type smoke detectors detect smoke using an optical sensor, whereas ionization-type smoke detectors use an ionization chamber containing radioactive material. The ionization type is cheaper and is particularly common in older buildings. A typical modern detector contains about 1.0 microcurie of the radioactive element americium, a decrease from 3 microcurie in 1978. The use of sealed radioactive material sources in fire detection systems is still permitted and regulated by the Canadian Nuclear Safety Commission (CNSC) and the Canadian Nuclear Safety Act. The radioactive sources in smoke alarms are sealed and contained within a metal case inside the smoke detector and must not be damaged or tampered with.

**Mould & Water Damage**

Mould is not specifically regulated in the province of Ontario. However, there are guidelines set forth by The American Industrial Hygiene Association (AIHA), Health Canada and the Environmental Abatement Council of Canada (EACC, 2015). All these guidelines recommend that any building materials supporting mould growth should be remediated as rapidly as possible to ensure a healthy environment. Once the presence of mould is confirmed, precautions for removal are based on an approximation of the extent of visible and potentially hidden mould growth, with input from a competent health and safety professional.

**OTHER DESIGNATED SUBSTANCES**

**Vinyl Chloride**
Vinyl chloride (monomer) is likely to be present in stable form within poly vinyl-chloride (PVC) piping and conduits and as a component of interior finishes. Such building materials are not considered to be hazardous in their current matrix/composition.

**Acrylonitrile**

Acrylonitrile or ACN (also known as vinyl cyanide) is an explosive, flammable liquid used in the manufacture of acrylic fibres, rubber-like materials and pesticide fumigants. Acrylonitrile was not noted and would not be expected to be present in the project specific area/surveyed area/subject building.

**Arsenic**

Arsenic is used in metallurgy for hardening copper, lead and alloys, in pigment production, in the manufacture of certain types of glass, in insecticides, fungicides and rodenticides, as a by-product in the smelting of copper ores, and as a dopant material in semiconductor manufacturing. Arsenic or arsenic compounds were not noted and are not expected to be present in the project specific area/surveyed area/subject building.

**Benzene**

Benzene or benzol is a colourless liquid. It is used as an intermediate in the production of styrene, phenol, cyclohexane, and other organic chemicals, and in the manufacture of detergents, pesticides, solvents, and paint removers. It is also found in gasoline. Benzene may be present in stable form in roofing materials, paints and adhesives located throughout the subject building. Such building materials are not considered to be hazardous in their current matrix/composition.

**Coke Oven Emissions**

Coke oven emission is benzene soluble fraction of total particulate matter of the substances emitted into the atmosphere from metallurgical coke ovens.

**Ethylene Oxides**

Ethylene oxide is a colourless gas liquefying below 12°C. It is used generally as a fumigant and sterilizing agent for medical equipment. It is used generally as a fumigant and sterilizing agent for medical equipment.

**Isocyanates**

Isocyanates compounds may be present in stable form in paint finishes, varnishes, and polyurethane plastics, synthetic rubbers, foams and adhesives. Such building materials are not considered to be hazardous in their current matrix/composition.

**METHODODOLOGY**
Site sampling and assessment was completed on May 20th, 2021, by Emily Morgan of BCE.

Designated Substances

Asbestos

Friability

O. Reg 278/05 requires that asbestos-containing materials (ACMs) be classified according to their friability. The classification is either designated as friable or non-friable. Friable products are those which can easily be crumbled by hand and release asbestos fibres into the air presenting a risk of inhalation exposure to those around. Non-friable products are not easily crumbled by hand and as a result less likely to release airborne asbestos fibres. However, precautions are important as non-friable ACMs can still release fibres when sanded, cut, abraded or drilled, especially with power tools.

Homogeneous Materials

Homogeneous materials are those that are uniform in colour and texture. Homogeneous materials were assumed to be similar in content. Samples were randomly collected to be representative of each suspect asbestos containing material and then assigned a homogenous material number accordingly.

Sampling and Analysis

Building materials suspected of containing asbestos were sampled in a manner to ensure that adequate sample volume was collected. Locations of materials sampled were documented and an indication of whether the material was friable or not was documented. The number of samples collected for each suspect material was completed as prescribed by O. Reg. 278/05 and detailed below in Table 1 – Material Sampling Requirements.

Table 1: Material Sampling Requirements

<table>
<thead>
<tr>
<th>Type of Material</th>
<th>Size of Area of Homogeneous Material</th>
<th>Minimum Number of Samples</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surfacing material, including without limitation material that is applied to surfaces by spraying, by troweling or otherwise. Examples include acoustical plaster on ceilings and fireproofing materials on structural members</td>
<td>Less than 90 m²</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>90 or more m², but less than 450 m²</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>450 or more m²</td>
<td>7</td>
</tr>
<tr>
<td>Thermal insulation, except as described below</td>
<td>Any size</td>
<td>3</td>
</tr>
<tr>
<td>Thermal insulation patch</td>
<td>Less than 2 linear meters or 0.5 m²</td>
<td>1</td>
</tr>
<tr>
<td>Any other material</td>
<td>Any size</td>
<td>3</td>
</tr>
</tbody>
</table>
Where applicable, samples of suspected ACMs were submitted to an independent accredited laboratory (Paracel Laboratories) of Ottawa, Ontario for asbestos content analysis. Paracel is a fully accredited facility for asbestos analysis. Polarized Light Microscopy was completed in accordance with U.S. Environmental Protection Agency (“EPA”) methodologies and dispersion staining techniques (EPA 600/R-93/116).

Materials are defined as asbestos-containing if they are more than 0.5% asbestos by dry weight. Less than this amount is not considered to be an asbestos-containing material in the province of Ontario.

**Evaluation of ACMs Based on Condition**

In evaluating an ACM’s condition, the following criteria was applied:

- **Good** – Material shows no signs of damage and/or is encapsulated. Asbestos-containing material could remain in place until eventual building demolition or major renovation.
- **Fair** – Material shows signs of minor damage (<5% damage) or otherwise near the end of useful life. This includes minor shrinking, cracking, delamination and/or other damage. Material should be monitored closely and scheduled to be repaired, encapsulated or removed.
- **Poor** – Damage is greater than 5% to any ACM material and is highly recommended to be removed, repaired or encapsulated.

**Lead**

Where applicable, samples of the primary interior finishes were collected using destructive means (i.e. a razor scraper) to ensure that adequate sample volume was collected. In addition, any suspected lead products that could not be sampled were visually assessed and documented (e.g. lead in pipe solder, lead in cast-iron pipe fittings and lead in emergency lighting batteries).

The Occupational Exposure Limit – Time Weighted Average (OEL-TWA) of a worker to lead dust is to be maintained at the lowest practical level with a view to achieving an ambient air concentration lower than 0.05 mg/m³.

**Mercury**

Mercury was not physically sampled as part of the assessment but was visually assessed and documented where noted. In a building environment, this typically includes mercury vials in older thermostats, mercury vapour in fluorescent light tubes and metal halide lamps. The elemental mercury in the thermostat vials and light tubes presents an occupational exposure risk to workers when the glass is broken and the liquid and/or vapour is released.

**Silica**

Silica is ubiquitous in our environment and present in numerous building products including, but not limited to, concrete, drywall, plaster, ceiling tiles, and mortar. The silica in these products is confined within the substrate of the material and therefore does not pose a hazard unless released and inhaled.
by an individual. As a result, it is not possible to sample the silica without causing a significant amount of disturbance. Therefore, BCE visually assessed and documented these materials where noted.

The OEL-TWA of a worker to silica dust is to be maintained at the lowest practical level with a view to achieving an ambient air concentration lower than 0.10 mg/m³ of air for quartz and Tripoli, and 0.05 mg/m³ of air for cristobalite and tridymite.
APPENDIX B:
Site Photographs
<table>
<thead>
<tr>
<th>Photo #</th>
<th>Material Location / Description</th>
<th>Photo</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>View of Hagen Hall (subject building) located at 115 Seraphin-Marion Private.</td>
<td><img src="image1.jpg" alt="Image" /></td>
</tr>
<tr>
<td>2</td>
<td>Asbestos-containing drywall joint compound (2% chrysotile) observed in Room 106.</td>
<td><img src="image2.jpg" alt="Image" /></td>
</tr>
<tr>
<td>3</td>
<td>View of non-asbestos-containing vinyl sheet flooring observed throughout the subject building.</td>
<td><img src="image3.jpg" alt="Image" /></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td></td>
</tr>
<tr>
<td>---</td>
<td>-------------</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>View of SCT - 2’ x 4’ Pinhole &amp; Small Fissures observed throughout the subject building with a date stamp.</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Asbestos-containing SCT - 2’ x 4’ White w/ Small Pinholes (2% amosite) observed in Room 106.</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>View of the water damage on ceiling tiles observed in Room 305.</td>
<td></td>
</tr>
</tbody>
</table>
APPENDIX C:
Asbestos-Containing Materials Inventory
## Appendix C - Asbestos Containing Materials Checklist

<table>
<thead>
<tr>
<th>Floor/Level</th>
<th>Location</th>
<th>Type of ACM</th>
<th>Asbestos Confirmed/ Suspected</th>
<th>Friable/Non-Friable</th>
<th>Damaged/ Deteriorated</th>
<th>Accessibility</th>
<th>Level of Work Near Material</th>
<th>Approx. Quantity</th>
<th>Unit</th>
<th>Recommended Action</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Room 100</td>
<td>Ceiling Tiles - 2’x4’ White w/ Small Pinholes</td>
<td>Confirmed Friable</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
<td>800</td>
<td>SF</td>
<td>Manage in Place</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Room 104D</td>
<td>Ceiling Tiles - 2’x4’ White w/ Small Pinholes</td>
<td>Confirmed Friable</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
<td>90</td>
<td>SF</td>
<td>Manage in Place</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Room 106</td>
<td>Ceiling Tiles - 2’x4’ White w/ Small Pinholes</td>
<td>Confirmed Friable</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
<td>345</td>
<td>SF</td>
<td>Manage in Place</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Throughout Level</td>
<td>Drywall Joint Compound</td>
<td>Confirmed -</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
<td>-</td>
<td>-</td>
<td>Manage in Place</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Throughout Level</td>
<td>Fire Doors</td>
<td>Suspected -</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
<td>-</td>
<td>-</td>
<td>Manage in Place</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1 Room 107J</td>
<td>Vinyl Floor Tiles (12”x12” - Grey w/ Streaks)</td>
<td>Confirmed Non-Friable</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
<td>70</td>
<td>SF</td>
<td>Manage in Place</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Room 200A</td>
<td>Ceiling Tiles - 2’x4’ White w/ Small Pinholes</td>
<td>Confirmed Friable</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
<td>45</td>
<td>SF</td>
<td>Manage in Place</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 Throughout Level</td>
<td>Drywall Joint Compound</td>
<td>Confirmed -</td>
<td>Good Condition</td>
<td>Easy</td>
<td>Low</td>
<td>-</td>
<td>-</td>
<td>Manage in Place</td>
<td></td>
<td></td>
<td></td>
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<td>2 Throughout Level</td>
<td>Fire Doors</td>
<td>Suspected -</td>
<td>Good Condition</td>
<td>Easy</td>
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<td>Good Condition</td>
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<td>Roofing Materials</td>
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APPENDIX D:
Other Designated Substances & Hazardous Materials Inventory
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<th>Type</th>
<th>Component</th>
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<th>Condition</th>
<th>Manufacturer</th>
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<th>Unit</th>
<th>Suspected/Confirmed</th>
<th>Recommended</th>
<th>Action</th>
<th>Comments</th>
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<tr>
<td>1 Throughout Level</td>
<td>Room 106</td>
<td>Mould/ Water Damage</td>
<td>Ceiling Tiles</td>
<td>White</td>
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<td>Unknown</td>
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<td>Battery Pack</td>
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<td>Aim-Lite</td>
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<td>Throughout Level</td>
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<td>- -</td>
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<td>1 Throughout Level</td>
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<tr>
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<td>Door Paint</td>
<td>Blue</td>
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<td>- -</td>
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<td>1 Throughout Level</td>
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<td>N/A</td>
<td>- -</td>
<td>Confirmed</td>
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<tr>
<td>1 Room 107</td>
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<td>Battery Pack</td>
<td>N/A</td>
<td>Good Condition</td>
<td>Aim-Lite</td>
<td>2 C</td>
<td>Confirmed</td>
<td>Manage in Place</td>
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<td>Good Condition</td>
<td>N/A</td>
<td>- -</td>
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<td>Manage in Place</td>
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<td>1 Throughout Level</td>
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<td>Alta</td>
<td>- -</td>
<td>Confirmed</td>
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<td>1 Room 107</td>
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## Hazardous Containing Materials Checklist

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<th>Component</th>
<th>Colour</th>
<th>Condition</th>
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<th>Unit</th>
<th>Suspected/Confirmed</th>
<th>Recommended Action</th>
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<td>Lead</td>
<td>Window Frame Paint</td>
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<td>-</td>
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<td>C</td>
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</table>
APPENDIX E: Drawings
NOTE: ASBESTOS-CONTAINING DRYWALL JOINT COMPOUND PRESENT THROUGHOUT
NOTE: ASBESTOS-CONTAINING DRYWALL JOINT COMPOUND PRESENT THROUGHOUT

LEGEND
- ASBESTOS-CONTAINING DRYWALL JOINT COMPOUND
- ASBESTOS-CONTAINING CEILING TILE
- ASBESTOS-CONTAINING VINYL FLOOR TILE

LEVEL 1 FLOOR PLAN. HAGAN HALL
NOTE: ASBESTOS-CONTAINING DRYWALL JOINT COMPOUND PRESENT THROUGHOUT

LEVEL 2 FLOOR PLAN, HAGAN HALL

LEGEND

ASBESTOS-CONTAINING DRYWALL JOINT COMPOUND
ASBESTOS-CONTAINING CEILING TILE

DESIGNATED SUBSTANCE SURVEY

UNIVERSITY OF OTTAWA

FEBRUARY 11, 2022

HAGEN HALL, 115 SÉRAPHIN-MARION PRIVATE, OTTAWA ON

HGN-03
NOTE: ASBESTOS-CONTAINING DRYWALL JOINT COMPOUND PRESENT THROUGHOUT

LEGEND

ASBESTOS-CONTAINING DRYWALL JOINT COMPOUND

LEVEL 3 FLOOR PLAN, HAGAN HALL
NOTE: ASBESTOS-CONTAINING DRYWALL JOINT COMPOUND PRESENT THROUGHOUT

LEVEL 4 FLOOR PLAN, HAGAN HALL

---

LEGEND

ASBESTOS-CONTAINING DRYWALL JOINT COMPOUND

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DESIGNATED SUBSTANCE SURVEY

UNIVERSITY OF OTTAWA

HAGEN HALL, 115 SÉRAPHIN-MARION
PRIVATE, OTTAWA ON

FEBRUARY 11, 2022

Project Location: HAGEN HALL, 115 SÉRAPHIN-MARION
PRIVATE, OTTAWA ON

Project Number: HGN-05

Client: UNIVERSITY OF OTTAWA

Completed by: JR

Checked by: DS

Figure Number: 21-228
NOTE: ROOF MATERIALS ARE PRESUMED TO BE ASBESTOS-CONTAINING