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**XCG File No. 5-336-200-01**  
**COLE File No. 2018-0565**  
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**DESIGNATED SUBSTANCES AND  
HAZARDOUS MATERIALS SURVEY  
PIN 614104-1  
7630 MAJOR MACKENZIE DRIVE EAST  
MARKHAM, ONTARIO**

Prepared for:  
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On Behalf of  
**PARKS CANADA AGENCY**  
**ROUGE NATIONAL URBAN PARK**

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**ES 1. EXECUTIVE SUMMARY**

COLE Engineering Group Ltd. and XCG Consulting Limited, hereafter referred to as the COLE Engineering & XCG Consulting Joint Venture, were retained by Public Services and Procurement Canada (PSPC) on behalf of Parks Canada Agency (PCA) to complete a Designated Substances and Hazardous Material Survey (DSHMS) to update the asbestos inventory and to serve as a resource for PCA in the management of their buildings within the Rouge National Urban Park (RNUP). Properties at the RNUP are represented with a numerical Property Identification Number (PIN).

This DSHMS was conducted at PIN 614104-1 located at 7630 Major Mackenzie Drive East, near Markham, Ontario (subject building). The investigation was completed to determine if designated substances and hazardous materials are present in the residential building, and what measures, if any, are required to mitigate potential exposure by persons entering the residential building and/or conducting any future demolition or renovations. It is understood that the shed located north of the subject building is not included in this DSHMS and was therefore not inspected.

The DSHMS involved a review of background information pertaining to the design and use of the residential building, site visit, and collection and testing of building materials suspected of being asbestos-containing materials (ACMs) and potential lead-based paints (LBP). All of the designated substances defined by the Ontario Ministry of Labour (MOL) under Ontario Regulation 490/09 (O. Reg. 490/09), O. Reg. 278/05 for asbestos, polychlorinated biphenyls (PCBs), and other potentially hazardous materials listed in the table below were evaluated, as well as other materials identified by PSPC. The results of the investigation to determine the potential presence or absence of designated substances are summarized in the following table.

Substance	Not Identified	Potentially Present	Determined Present
Acrylonitrile	X		
Arsenic	X		
Asbestos	X	X	
Benzene		X	X
Halocarbons	X		
Coke Oven Emissions	X		
Ethylene Oxides	X		
Isocyanates	X		
Lead		X	X
Mercury			X
Mould		X	
Polychlorinated Biphenyls (PCBs)	X		
Silica		X	X
Urea Formaldehyde Foam Insulation (UFFI)	X		
Vinyl Chloride	X		
Chemical Storage	X		
Fuel Oil		X	X
Waste Oil	X		

The substances that were not identified on-site are not likely to be a concern and require no further evaluation or management. A further discussion of the substances that are present or potentially present is provided below.

#### ***Asbestos-Containing Materials***

At the time of the Designated Substances Survey conducted in 2009, five types of materials were submitted for laboratory analysis. All five types of materials were confirmed to be non-ACMs.

In 2019, five types of materials were submitted for laboratory analysis of asbestos. Insulation in the attic, sheet flooring top and middle layers and vinyl floor tiles bottom layer from the kitchen, hall and first floor washroom, plaster from the office chimney, and caulking from the exterior windows of sunroom 1 were confirmed to be non-ACMs. It should be noted that roofing materials were not collected due to the height and safety precautions; however, some roofing materials are known to have been manufactured with asbestos and therefore these materials are presumed to be ACM. Prior to disturbance, resample all roofing material layers to confirm ACM or undertake Type 1 abatement if required.

#### ***Lead-Based Paints***

In 2009, three paint samples were collected and submitted to a laboratory for lead analysis. Two of the paint samples were found to be lead-based with concentrations of 31,000 ppm and 47,000 ppm. One paint was too well adhered to the wall to collect a sufficient sample volume for analysis to meet the lead reporting limit, and is therefore considered potentially lead-based.

In 2019, seven paint samples were collected and submitted for lead analysis. Six of these paint samples were found to be lead-based with concentrations ranging from 420 ppm to 42,000 ppm. At the time of the survey, teal paint throughout the second floor office, lilac paint on the second floor washroom walls, and brown paint on the second floor bedroom 1 wood floors were in poor condition and had areas of flaking or peeling paint. Lead-based paints in poor condition had concentrations ranging between 420 ppm and 5,600 ppm. Because the subject building is unoccupied, the urgency level for repair is considered moderate. Flaking paints should be cleaned up or removed using power tools with a high-efficiency particulate air (HEPA) filter-equipped vacuum to limit the potential for the spread of lead dust.

#### ***Mercury***

Small quantities of mercury are present in the thermostat observed in the first floor kitchen. No samples were collected or submitted for laboratory analysis. Prior to any demolition or renovations to the building, the thermostat must be handled and if necessary, disposed of in accordance with O. Reg. 490/09 (as amended).

#### ***Mould***

Visible potential mould was observed on the north wall and ceiling of the second floor washroom and in the southwest corner of the second floor bedroom 2.

**Silica**

Concrete and mortar-based building materials were observed, but do not represent a concern in their present state and condition.

**Fuel, Oil, and Waste Oil Storage (Containing Benzene)**

A 909-L fuel oil above ground storage tank (AST) was located on the second floor covered porch. Fuel is benzene-containing. All fuels and oils should be stored in accordance with the Storage Tank Systems for Petroleum Products and Allied Petroleum Products (SOR/2008-197) requirements.

**Summary**

In summary, designated substances, as indicated in the table below are present or likely to be present. During any renovations or demolition, PSPC and PCA representatives and project contractors should ensure that the materials are properly handled and disposed of in accordance with Federal and Provincial regulations.

Material	Sample ID	Description	Location	Quantity (square metres)	Condition	Action (Urgency Level)	Photo
Asbestos	Presumed	Roofing materials	Exterior roof	200 m <sup>2</sup>	Good	Action 4 or 6 – routine surveillance. Type 1 abatement if required.	Photo 1
Lead Paint	614104-1-P-1	Teal paint	Second floor office walls and ceiling	50 m <sup>2</sup>	Poor	Remove chipped or flaking paint and paint over damaged areas (Moderate)	Photo 2
Lead Paint	614104-1-P-2	Brown paint	First floor living room moulding and trim	15 m <sup>2</sup>	Good	None	Photo 3
Lead Paint	614104-1-P-3	Yellow paint	First floor washroom trim	5 m <sup>2</sup>	Good	None	Photo 4
Lead Paint	614104-1-P-4	Lilac paint	Second floor washroom walls	15 m <sup>2</sup>	Poor	Remove chipped or flaking paint and paint over damaged areas (Moderate)	Photo 5
Lead Paint	614104-1-P-5	Brown paint	Second floor bedroom 1 wood floors	10 m <sup>2</sup>	Poor	Remove chipped or flaking paint and paint over damaged areas (Moderate)	Photo 6
Lead Paint	614104-1-P-6	Pink paint	Second floor bedroom 3 window frame, moulding, and trim	5 m <sup>2</sup>	Fair	Remove chipped or flaking paint and paint over damaged areas.	Photo 7
Lead Paint	LS-02	Purple/blue paint	First floor kitchen doors, cabinet, and trim	-	-	-	-
Lead Paint	LS-03	White paint	First and second floor storage room, both washrooms, all three bedrooms, and hallway on doors and ceilings	-	-	-	-
Mercury	-	Thermostat	First floor kitchen	-	-	Handled and if necessary, disposed of in accordance with O. Reg. 490/09 (as amended).	Photo 8

Material	Sample ID	Description	Location	Quantity (square metres)	Condition	Action (Urgency Level)	Photo
Mould	-	Suspect mould – dark staining behind plaster	Second floor washroom / bedroom 2 walls and ceiling	0.5 m <sup>2</sup> / 1 m <sup>2</sup>	-	Clean with soap and water or bleach or solution. Investigate to confirm presence and/ or extent of mould impact. (Moderate; High if to be occupied)	Photo 10
Silica	-	Brick and mortar / concrete block / cement floor / drywall and plaster walls and ceiling / ceramic tiles	Exterior / basement foundation / basement floor / throughout / bathroom	-	Good	Prohibit drilling, grinding, cutting, and abrading silica-containing material unless safety precautions taken (wetting and HEPA filter)	-
Fuel oil	-	Fuel oil	AST on second floor covered porch	909 L	Good	Manage any fuel oil tank and its contents in accordance with the Storage Tank Systems for Petroleum Products and Allied Petroleum Products (SOR/2008-197) requirements.	Photo 9
<p>Notes:</p> <p>Urgency Level: Identified for ACMs or lead-containing paint in poor condition only. Additional information provided in Section 6.0 for each material.</p> <p>(High): Immediate repairs required.</p> <p>(Moderate): Repairs required.</p> <p>-: Not applicable.</p>							

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## 1. INTRODUCTION

COLE Engineering Group Ltd. and XCG Consulting Limited, hereafter referred to as the COLE Engineering & XCG Consulting Joint Venture, were retained by Public Services and Procurement Canada (PSPC) on behalf of Parks Canada Agency (PCA) to complete a Designated Substances and Hazardous Material Survey (DSHMS) to update the asbestos inventory and to serve as a resource for PCA in the management of their buildings within the Rouge National Urban Park (RNUP). Properties at the RNUP are represented with a numerical Property Identification Number (PIN). The subject site is shown on Figures 1 through 6.

PCA as a federal department has asbestos management policy and guidance documents titled “Parks Canada Asbestos Management Standard” and “Parks Canada Asbestos Management Guide,” both dated January 2014. The policy and guideline documents describe PCA’s requirements for asbestos management on PCA properties.

The purpose of the DSHMS was to determine if any designated substances and other potentially hazardous materials are present at the subject building and provide references for the management as required to mitigate potential exposure by persons entering the building and/or conducting any demolition or renovation activities. The survey included all designated substances defined by the Ontario Ministry of Labour (MOL) and PCA, as well as other potentially hazardous materials, and included testing of potential asbestos-containing materials (ACMs) and lead-based paints (LBP). An inventory of designated substances and other potentially hazardous materials present or potentially present was developed.

### 1.1 Building Description

The subject building, PIN 614104-1 is located at 7630 Major Mackenzie Drive East, near Markham, Ontario. Currently the building is unoccupied. A photograph of the exterior of the residential dwelling is included as Photo 1 in Appendix C.

The subject building consists of one residential building. The original construction date of the building is unknown. The interior construction of the building is comprised of lath and plaster walls and ceilings, texture coat (stucco) and drywall ceilings, wood panel walls, hardwood, sheet flooring, and vinyl flooring. One hole was observed in the second floor hallway and two holes had been cut in the ceiling of bedroom 3. Attic insulation was observed and collected from the hallway through the cut opening. The attic consisted of blown cellulose insulation. It is understood that shed located north of the subject building is not included in this DSHMS and was therefore not inspected.

### 1.2 Historic Reports

As part of this DSHMS, a previous report was reviewed prior to the 2018 DSHMS site visit, and summarized below:

***Jacques Whitford Stantec Ltd., “Compliance Designated Substances and Hazardous Materials Assessment: 7630 Major Mackenzie, Pickering, ON, PIN614104-1,” November 2, 2009***

A Designated Substances Survey (2009 DSS) was conducted at the subject building on October 7, 2009. The DSS included an inspection of all accessible interior and exterior areas of the building.

Samples of texture coat in the first floor kitchen, ceiling tiles in the first floor storage room, texture coat (stucco) in the first floor living room, plaster and ceiling tiles in the first floor den were collected and submitted for asbestos analysis. The laboratory analysis indicated that none of these samples were ACM. Mastic under flooring, caulking around doors and windows, and roofing material were suspected ACM but were not sampled.

In 2009, three paint samples were collected and submitted to a laboratory for lead analysis. Two of the paint samples were found to be lead-based with concentrations of 31,000 ppm and 47,000 ppm. One paint was too well adhered to the wall to collect a sufficient sample volume for analysis to meet the lead reporting limit, and is therefore considered potentially lead-based.

Mercury was identified in a wall-mounted thermostat in the first floor kitchen. Silica was identified in concrete, brick, mortar, ceiling tiles, and ceramic tiles.

Acrylonitrile and arsenic were suspected to be present in adhesives and paints; benzene was suspected in roofing materials, adhesives, and paints; isocyanates were suspected in paint finishes; and vinyl chloride was suspected in PVC piping and conduits and interior finishes.

No materials containing coke oven emissions, ethylene oxide, isocyanates, PCB-containing equipment, or halocarbon-containing equipment were observed at the subject building.

Details are discussed in Section 5.

## 2. SCOPE OF WORK

The scope of work for the DSHMS included the following activities:

- Review of drawings and related information pertaining to the design and condition of the building;
- Inspection and sampling of potential hazardous materials within the subject building that could be reasonably accessed by occupants, workers and the general public;
- Documentation of the locations of potential hazardous materials and estimation of quantities;
- Submission of representative samples of potential hazardous materials for laboratory analysis; and
- Preparation of a report summarizing the results of the DSHMS for the building.

The field survey included an inspection of accessible areas of the subject building, and the visual identification of potential designated substances. Where confirmation was required to verify the presence or absence of certain designated substances (specifically lead and asbestos) within a building material, representative samples were collected and submitted for analysis to EMSL Analytical Inc. (EMSL), a National Voluntary Laboratory Accreditation Program (NVLAP) and American Industrial Hygiene Association (AIHA) accredited laboratory.

### 2.1 Designated Substances

Table 1 lists the designated substances and other potentially hazardous materials that were evaluated and included in the survey.

**Table 1 List of Designated Substances and Hazardous Materials Evaluated at the Subject Site**

Designated Substances	Other Potentially Hazardous Materials
Acrylonitrile	Polychlorinated biphenyls (PCBs)
Arsenic	Halocarbons
Asbestos	Urea formaldehyde foam insulation (UFFI)
Benzene	Mould (limited)
Coke oven emissions	Chemical Storage
Ethylene oxide	Fuel Oil
Isocyanates	Waste Oil
Lead	
Mercury	
Silica	
Vinyl chloride	

### **3. REGULATIONS AND GUIDELINES**

The site is considered a federal site and is governed by the *Canada Labour Code (Part II)*, and associated regulations, specifically the *Canada Occupational Health and Safety Regulations (SOR/86-304)*. This code establishes responsibilities and requirements of employers, managers and supervisors who act on behalf of the employer and employees.

Since the standards and qualifications of working with ACMs and lead varies between each provincial and territorial region in Canada, PCA requires that the applicable regional requirements are met for any contracted work (including surveys, testing, removal, etc.). Therefore, the Ontario provincial regulations and guidelines, specifically, Ontario Regulation (O. Reg.) 278/05 *Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations* (as amended), and the MOL guideline “*Lead on Construction Projects*”, dated April 2011, documents have been consulted and referenced for this project.

#### **3.1.1 Asbestos Containing Material (ACM)**

Asbestos was used in building materials such as mechanical pipe insulation, fireproofing, and interior finishes, such as plaster and drywall joint compound until approximately the mid-1980s. Asbestos was also commonly used in vinyl and linoleum flooring products, acoustic ceiling tiles, adhesives, and caulking, among other materials.

PCA as a federal department has an asbestos management policy and guidance documents titled “Parks Canada Asbestos Management Standard” and “Parks Canada Asbestos Management Guide,” both dated January 2014. The policy and guideline documents describe PCA’s requirements for asbestos management on PCA properties.

Although, the RNUP is considered federal property and federal regulation apply, PCA uses the more stringent of the federal and provincial regulations. For projects in Ontario, O. Reg. 278/05 requirements are considered as a best practice. The management of ACMs is governed under Ontario Regulation (O. Reg.) 278/05 *Designated Substance – Asbestos on Construction Projects and in Buildings and Repair Operations* (as amended). Building materials found to have 0.5 percent or greater asbestos by dry weight are considered to be ACMs. This regulation describes the procedures and protocols for the identification and removal of ACM from buildings. If ACM is known or suspected to be present, then the locations of the material must be documented, and the material managed and removed in accordance with O. Reg. 278/05.

Disposal of ACM is governed under O. Reg. 347 General Waste Management (as amended) and requires that all ACM waste must be placed in a double sealed labelled container that is free of cuts, tears, or punctures and disposed of in a licensed waste facility that has been properly notified.

#### **3.1.2 Lead-Based Paint**

Lead is a heavy metal and is typically found in inorganic compounds often occurring as components of products such as pigments, varnishes, and paints. Lead exposure is

a particular concern from lead based dust during renovation, demolition, or construction activities, or from deterioration of wall coverings.

The Surface Coating Materials Regulations under the Hazardous Products Act (HPA) states that paints having a lead content greater than 90 parts per million (ppm) (90 mg/kg) are considered lead-based. Although not a workplace, O. Reg. 490/09 (as amended) may be used as a best practice guide when renovations or demolition is being undertaken. O. Reg. 490/09 (as amended) stipulates that workers shall be protected from exposure to airborne lead if they are undertaking an activity that disturbs surfaces covered with lead-based paint. The MOL guideline “*Lead on Construction Projects*” dated April 2011, outlines procedures that should be used during renovation or demolition activities to ensure that worker exposure to lead does not exceed regulated limits specified in the Ontario Health and Safety Act (OHSA).

### **3.1.3 Halocarbons**

Halocarbons are chemical compounds that include most ozone depleting substances, chlorofluorocarbons and their halogenated replacements, many of which are greenhouse gases. The use and handling of halocarbons in refrigeration and air conditioning, fire-extinguishing, and solvent systems on federal lands are controlled by the Federal Halocarbon Regulations, 2003. “Small” systems, such as household appliances, are exempt from the annual leak test requirement.

### **3.1.4 Mercury**

Mercury is contained within some thermostats and fluorescent light bulbs. Mercury exposure may occur from airborne vapours or through skin absorption. There is no personal, occupational or environmental concern associated with mercury in its current state and condition. Normal use of a thermostats and fluorescent light bulbs would not cause exposure to vapours. Therefore, residents in a home are unlikely to be exposed. However, if damage occurs to these materials, mercury could be released. Those at highest risk of exposure are construction workers during renovation, demolition, or construction activities. Manage mercury containing equipment in accordance with applicable legislative requirements.

### **3.1.5 Mould**

The presence of mould was not included in the scope of work for this project. As such XCG and COLE did not conduct any inspections specific to mould growth. If significant mould growth was observed, a note was made, however sampling of moulds was not conducted.

Mould spores are present in all indoor and outdoor environments and cannot be completely eliminated. Cellulose-based building materials provide a nutrient base for many mould species; however, moulds generally do not grow unless an adequate amount of moisture is present.

There are no clear regulatory standards for determining acceptable concentrations of mould in indoor air. Listed below are commonly used industry references used to help identify and evaluate mould contamination in buildings:

- “*Guidelines for the Investigation, Assessment, & Remediation of Mould in Workplaces*,” Manitoba Department of Labour and Immigration, Workplace Safety and Health Division, March 2001;
- “*Mold Remediation in Schools and Commercial Buildings*,” U.S. E.P.A. Office of Air and Radiation, Indoor Environments Division, September 2008;
- “*Guidelines on Assessment and Remediation of Fungi in Indoor Environments*,” New York City Department of Health, November 2008;
- “*Mould Guidelines for the Canadian Construction Industry*,” Standard Construction Document CCA 82, 2004; and
- “*Mould Abatement Guidelines*,” Environmental Abatement Council of Ontario (EACO), Edition (3) 2015.

### **3.1.6 PCBs**

PCBs were historically used as dielectric and coolant fluids in electrical equipment such as capacitors, transformers, heat exchangers, electric motors, and fluorescent light ballasts. PCBs are known carcinogens to mammals and humans; therefore, PCB sales were banned in Canada in 1977 and releasing the chemical into the environment was banned in 1985; however, owners of PCB-containing equipment are allowed to continue to use the equipment until the end of its service life, with the storage, handling, transport, and destruction of the PCBs regulated by Environment Canada, SOR 2008-273.

### **3.1.7 Silica**

Silica occurs naturally as crystalline or amorphous material. It is normally found in concrete, mortar, acoustic ceiling tiles, and stucco finishes. Silica exposure is a particular concern from airborne silica dust during renovation, demolition, or construction activities. There is no personal, occupational or environmental concern associated with silica in its current state and condition. Therefore, residents in a home are unlikely to be exposed. However, if dust creating disturbance occurs to these materials, silica could be released. Those at highest risk of exposure are construction workers during renovation, demolition, or construction activities.

Manage silica containing dust during renovations in accordance with applicable legislative requirements.

### **3.1.8 UFFI**

UFFI is a type of insulation made from a foaming agent and compressed air used to insulate hard to reach areas, such as within pre-existing hollow walls. In Canada, UFFI was approved for use in 1977 and was banned in 1980; however, approximately 100,000 homes in Canada contain UFFI. During the curing process of the insulation, formaldehyde gas is emitted, which can cause eye irritation, respiratory problems, nausea, and headaches; however, many other household materials create formaldehyde gas, and humidity, mould, other airborne chemicals and a tightly sealed house can also cause the same symptoms as UFFI.

**3.1.9 Other Designated Substances and Hazardous Materials**

The other designated substances and hazardous materials that were part of the survey are regulated by the following Ontario or Canadian regulations include acrylonitrile, arsenic, benzene, coke oven emissions, ethylene oxide, isocyanates, and vinyl chloride.

These designated substances are typically found in industrial settings and are unlikely to be located within the residential dwelling, with the exception of benzene, which is present within the furnace oil in the AST in the covered porch on the east side of the subject dwelling.

## **4. SURVEY METHODOLOGY**

Ms. Jerralyn Cole of COLE conducted the DSHMS on January 30, 2019.

The fieldwork was conducted in accordance with XCG and COLE's standard field procedures and health and safety measures. Details regarding the approach used in conducting the field investigations including sampling procedures and analytical methodologies are outlined in this section.

Where it was considered possible that designated substances or hazardous materials existed in areas that could not be accessed without employing destructive methods, such methods to access the area were not used, as the building was occupied, and occupancy was to be on-going.

### **4.1 Site Observations**

The survey included room by room visual observations of reasonably accessible areas to identify the presence of designated or hazardous materials in the project area. The survey was undertaken in a manner to minimize repetition of observations and sampling of like areas (e.g., painted surfaces).

The following building components were assessed individually during the survey as part of routine field procedures:

- Walls;
- Ceiling;
- Floors;
- Mechanical Systems (i.e. pipe wrap);
- Chemical Storage Areas; and
- Fuel, Oil, and Fuel Oil Storage Areas.

During the site survey, bulk samples for asbestos content analysis and paint chip samples for lead in paint analysis were collected and submitted under chain-of-custody to EMSL.

Observations were made of possible visible mould; however, no samples were submitted for laboratory analysis, as this was outside the scope of work for this project.

If fluorescent light ballasts were observed, a minimum of 10% of the light ballasts were visually inspected to identify whether or not PCBs were present within the ballast.

### **4.2 Confirmatory Sampling**

A sufficient number of samples were collected to conclusively identify suspect materials. Duplicate sampling is included as part of the multiple asbestos samples collected (minimum of three) following O. Reg. 278/05. One sample of each paint colour was submitted for laboratory analysis; however, laboratory duplicates are analyzed on one of every 20 samples. Discretion was used to avoid testing duplicate



materials. The samples were collected and handled according to applicable occupational health and safety regulations.

### **4.3 Record Keeping**

Prior to the on-site survey and sampling, a unique and logical sample identification system was developed. This sample identification consisted of the following:

- Property PIN identifier;
- Sample identification; and
- Sequential sample number.

The information on the sample identification, location collected, physical description, condition of material sampled, and quantity of material was collected during the survey.

#### **4.3.1 Asbestos-Containing Material**

Visual observations of accessible areas in the building were made in order to identify the presence of materials suspected of containing asbestos. The visual surveys were primarily limited to a survey of structures in areas with reasonable accessibility.

The following suspected ACMs were sampled: insulation, sheet flooring, vinyl floor tiles, plaster, tar, and caulking. Bulk samples of materials suspected of containing asbestos were collected and were later submitted to EMSL for analysis by polarized light microscopy (PLM) with dispersion staining, following USEPA Method 600/R-93/116 under chain-of-custody protocol or by the qualitative transmission electron microscopy (TEM) and gravimetric reduction method.

#### **4.3.2 Sampling of Suspected Asbestos-Containing Materials**

During the survey of the building, a sufficient number of bulk samples were collected to meet the requirements of O. Reg. 278/05 and the “Parks Canada Asbestos Management Standard” and “Parks Canada Asbestos Management Guide,” both dated January 2014, and submitted for laboratory analysis in order to determine the existence and quantities of friable and non-friable asbestos containing materials present in the project area. Each of the layers of a material suspected of containing asbestos were sampled.

##### **4.3.2.1 Sampling of Friable Materials**

During the sampling of any friable materials suspected of containing asbestos, a respirator was worn, and the following sampling procedure was followed:

1. The surface of the material to be sampled was first wetted using a spray bottle to apply the water.
2. A sample was obtained by slowly pushing the sampler (i.e. knife blade) into the material with a twisting motion, until the entire thickness was penetrated. Wetting was continued through the entire process. The sampler was then extracted.
3. The sample was then ejected into a sealable plastic sample bag and labelled as described in Section 4.3.

4. The sampler was thoroughly cleaned after the collection of each sample to avoid potential cross contamination of samples. This cleaning was done by wiping down the blade with water.

**4.3.2.2 Sampling of Non-Friable Materials**

The following sampling procedure was used during the sampling of any non-friable materials suspected of containing asbestos.

1. A sample was obtained by slowly pushing the sampler (i.e. knife blade) into the material with a twisting motion. The sampler was then extracted.
2. The sample was then ejected into a sealable plastic sample bag and labelled. In the case of vinyl tiles, a small portion of broken tile was collected, or a hammer and chisel were used to score the tile and then break a piece off.
3. The sampler was thoroughly cleaned after the collection of each sample to avoid potential cross contamination of samples by wiping down the sampler with water.

**4.3.3 Accessibility and Action Matrix**

The location, approximate volume/area, condition and accessibility of all potential ACMs was recorded in accordance with guidance provided in the Parks Canada Asbestos Management Guide (January 2014). Recommended asbestos control actions were identified based on the condition and accessibility of each confirmed/assumed ACM in accordance with the Action Matrix as defined in Table 6.1 of the Parks Canada Asbestos Management Guide, reproduced in Table 3 below.

The accessibility of building materials suspected of containing asbestos was rated in the field according to the criteria listed in Table 2.

**Table 2 Accessibility of Building ACMs**

<b>Access Category</b>	<b>Definition</b>
Access A	Areas of the building within reach (from floor level) of all building users.
Access B	Frequently entered maintenance areas within reach of maintenance staff, without the need of a ladder.
Access C (Exposed)	Areas of the building above 2.4 m where use of a ladder is required to reach the ACM.
Access C (Concealed)	Areas of the building that require the removal of a building component, including lay-in ceilings and access panels into solid ceiling systems.
Access D	Areas of the building behind inaccessible solid ceiling systems, walls or mechanical equipment etc. where demolition of the ceiling, wall or equipment etc. is required to reach the ACM.

The PCA Action Matrix below establishes the recommended asbestos control action depending on two variables: 1) the condition of the ACM; and 2) the access level. The actions that correspond to this table are described below in Table 3.

**Table 3 PCA Action Matrix**

Access	ACM Condition			Debris
	Good	Fair	Poor	
(A)	ACTION 4 or 6 <sup>1</sup>	ACTION 4 or 5 <sup>2</sup>	ACTION 3	ACTION 1
(B)	ACTION 4 or 6	ACTION 5 or 4 <sup>3</sup>	ACTION 3	ACTION 1
(C) exposed	ACTION 4 or 6	ACTION 4 or 5	ACTION 2	ACTION 2
(C) concealed	ACTION 4 or 6	ACTION 4 or 6	ACTION 2	ACTION 2
(D)	ACTION 4 or 6	ACTION 6	ACTION 6	ACTION 6

**NOTES:**

<sup>1</sup> If material in ACCESS (A)/GOOD condition is not removed, ACTION 6 is required.

<sup>2</sup> If material in ACCESS (A)/FAIR condition is not removed, ACTION 5 is required.

<sup>3</sup> Remove ACM in ACCESS (B)/FAIR condition if ACM is likely to be disturbed.

**ACTION DESCRIPTIONS**

**ACTION 1 Immediate clean-up of debris that is likely to be disturbed**  
Restrict access that is likely to cause a disturbance of the ACM debris and arrange for immediate clean up of ACM debris in accordance with appropriate Work Type procedures.

**ACTION 2 Limit/Restrict entry into areas where ACM is present and likely to be disturbed by access, or where ACM debris is present, until ACM or ACM debris is removed.**  
Restrict access to the area to authorized staff or asbestos contractor personnel. At locations where ACM debris can be temporarily isolated, use appropriate means to limit entry to the area until the ACM debris has been removed, and the source of the debris has been stabilized or removed.

**ACTION 3 ACM removal**  
Arrange for removal of ACM in accordance with appropriate Work Type procedures.

**ACTION 4 Optional ACM removal**  
If merited by a cost/benefit analysis, arrange for removal of ACM in lieu of repair, or at locations where the presence of asbestos in GOOD condition is not desirable.

**ACTION 5 ACM repair**  
Arrange for repair ACM found in FAIR condition, and not likely to be damaged again or disturbed by normal use of the area or room. Upon completion of the repair work, treat ACM as material in GOOD condition and implement ACTION 6. If ACM is likely to be damaged or disturbed, during normal use of the area or room, implement ACTION 4.

**ACTION 6 Routine surveillance**  
Institute routine surveillance of the ACM, in accordance with appropriate Work Type procedures.

#### 4.3.4 Sampling of Suspected Lead-Based Paint

Samples from the subject building of visibly different paints were collected through small scrapings of the paint from the substrate and/or where paint was observed to be peeling or flaking. The location, approximate volume/area, and condition of each different paint was recorded based on visual observation. All paint samples were submitted to EMSL and analyzed by USEPA Method SW-846 Flame Atomic Absorption Spectrophotometry.

#### 4.4 Quality Assurance and Quality Control

Each sample was collected in a clean single use sample bag suitable for lead and asbestos sample collection. All sample bags were labelled with the appropriate sample ID at the time of sample collection. Additional quality assurance and control procedures included: dedicated one-use sealable sample bags, the use of disposable nitrile gloves for all sample collection activities; and cleaning tools between samples by damp wiping with a single use moist towelette, or a single use wet paper towel.

Asbestos sampling requires a minimum of three samples for each suspect sample material collected to determine of the asbestos fibre concentration. Duplicate samples are built into the required number of samples as per the regulation.

Lead in paint samples are collected as a single sample for each of the suspected lead containing surface coatings. Samples collected were representative of the colour of the top layer of paint, however, multiple layers of paint down to the base layer were collected if possible. Laboratory duplicates were relied upon, which for this project is one laboratory duplicate per 20 samples.

All requested sample analysis was filled into a laboratory chain-of-custody prior to shipment. All samples were shipped or dropped off at the laboratory with the corresponding chain-of-custody for confirmation of receipt at the laboratory. The laboratory's quality assurance program follows guidelines as documented in *General requirements for the competence of testing and calibration laboratories* (ISO/IEC 17025:2017). In addition, the program requirements of the AIHA and the NVLAP, the American Association for Laboratory Accreditation, the NELAC Institute, as well as other applicable regulatory requirements associated with laboratory accreditations/certifications are followed. Quality control is performed according to the scope of the laboratories accreditation status and quality control requirement for each type of analysis. Asbestos analysis was completed following *Method For The Determination Of Asbestos In Bulk Building Materials* (EPA 600/R-93/116). Analysis of lead in paint chips was completed following Flame Atomic Absorption Spectrophotometry (EPA SW-846 Test Method 7000B).

## 5. SURVEY FINDINGS

### 5.1 Substance Identification

The likely presence or absence of designated substances and other potentially hazardous materials within the subject building was initially assessed through background research, visual observation and inspection, and discussions with personnel knowledgeable about the building.

Table 4 summarizes the potential presence or absence of each designated substance at the subject site, based on on-site observations and the results of sampling of potential asbestos containing and lead-based materials.

**Table 4 Suspected Designated Substances and Potentially Hazardous Materials**

Substance	Not Identified	Potentially Present	Determined Present
Acrylonitrile	X		
Arsenic	X		
Asbestos		X	
Benzene		X	X
Halocarbons	X		
Coke Oven Emissions	X		
Ethylene Oxides	X		
Isocyanates	X		
Lead		X	X
Mercury			X
Mould		X	
Polychlorinated Biphenyls (PCBs)	X		
Silica		X	X
Urea Formaldehyde Foam Insulation (UFFI)	X		
Vinyl Chloride	X		
Chemical Storage	X		
Fuel Oil		X	X
Waste Oil	X		

The substances that were not identified on-site are not likely to be a concern and require no further evaluation or management. A further discussion of the substances that are present or potentially present is provided below.

#### 5.1.1 Asbestos

Potential ACMs visually identified in the building included insulation, sheet flooring, vinyl floor tiles, plaster, and caulking.

The following samples were collected and submitted for laboratory analysis: insulation from the attic, caulking from the exterior sunroom window, sheet flooring from the second floor washroom, sheet flooring and vinyl floor tile from the first floor kitchen, and plaster and tar from the second floor office chimney/bulkhead.

It should be noted that roofing materials were not collected due to the height and safety precautions; however, some roofing materials are known to have been manufactured

with asbestos and therefore these materials are presumed to be ACM. The details for each ACM material are provided below in Section 5.2.1.

### **5.1.2 Lead**

Potential lead-based paints were visually identified in the building. In 2009, three paint samples were collected and submitted to a laboratory for lead analysis. Two of the paint samples were found to be lead-based with concentrations of 31,000 ppm and 47,000 ppm. One paint was too well adhered to the wall to collect a sufficient sample volume for analysis to meet the lead reporting limit, and is therefore considered potentially lead-based. In 2019, seven paint samples were collected and submitted for lead analysis. Six of these paint samples were found to be lead-based with concentrations ranging from 420 ppm to 42,000 ppm.

### **5.1.3 Halocarbons**

Based on observations made during the site visit, equipment potentially containing halocarbons were not identified.

### **5.1.4 Mercury**

Small quantities of mercury were identified in a thermostat in the first floor kitchen. No samples were collected or submitted for laboratory analysis.

### **5.1.5 Mould**

Approximately half a square metre (0.5m<sup>2</sup>) of suspect mould was observed on the north wall of the second floor washroom and one square metre (1m<sup>2</sup>) of suspect mould was observed in the walls and ceiling in the southwest corner of the second floor bedroom 2. No samples were collected or submitted for laboratory analysis.

### **5.1.6 PCBs**

No PCB-containing equipment was identified during the 2019 site visit.

### **5.1.7 Silica**

Free crystalline silica is expected to be present within all concrete and mortar-based building materials within the building. No samples were collected or submitted for laboratory analysis.

### **5.1.8 Fuel, Oil, and Waste Oil Storage (Containing Benzene)**

A 909 L fuel oil AST was located on the second floor covered porch. Furnace oil is benzene-containing. The AST manufacturing date is unknown. A photograph of the furnace oil AST is shown in Photo 9 in Appendix C. All fuels and oils should be stored in accordance with the Storage Tank Systems for Petroleum Products and Allied Petroleum Products (SOR/2008-197).

## **5.2 Summary of Laboratory Results**

Figure 1 identifies the sample collection locations for both ACM and lead-based paint on the first floor of the subject building. Figure 2 identifies the sample collection locations for both ACM and lead-based paint on the second floor of the subject

building. Figure 3 identifies the sample collection locations for lead-based paint in the basement. Figure 4 identifies the location of the confirmed designated substances on the first floor. Figure 5 identifies the location of the confirmed designated substances on the second floor. Figure 6 identifies the location of the confirmed designated substances in the basement. Laboratory certificates of analysis from the laboratory are provided in Appendix B. Select photographs showing ACM and lead-based paint locations within the building are presented in Appendix C.

### **5.2.1 Asbestos Containing Materials**

Table 5 provides a summary of the results of the asbestos analysis for the surveyed areas at the subject building.

### **5.2.2 Lead-Based Paint**

Table 6 provides a summary of the paint samples analysed for the surveyed areas within the subject building.

**Table 5 Summary of Asbestos Results**

Sample ID	Sample Description	Location	Asbestos Content	Historic Results	Quantity <sup>1</sup>	Condition <sup>2</sup>	Accessibility <sup>3</sup>	Friability <sup>4</sup>	Action Level <sup>5</sup> (Urgency Level <sup>6</sup> )	Comments	Photo
<b>2019 DSHMS</b>											
614104-1-IN-1-A,B,C	Cellulose insulation	Attic	-	-	-	-	-	-	-	-	-
614104-1-SF/VT-1-A,B,C (Composite Sample)	White sheet flooring (middle layer) over grey vinyl floor tiles (bottom layer)	First floor kitchen, washroom, and hall floor	-	-	-	-	-	-	-	-	-
614104-1-PL-1-A,B,C (Composite Sample)	Plaster and tar	Second floor office chimney	-	-	-	-	-	-	-	-	-
614104-1-SF-2-A,B,C	White sheet flooring (top layer)	First floor kitchen, washroom, and hall, and second floor washroom floor	-	-	-	-	-	-	-	-	-
614104-1-CK-1-A,B,C	White caulking	Exterior sunroom 1 window	-	-	-	-	-	-	-	-	-
<b>Presumed</b>	<b>Roofing materials</b>	<b>Exterior roof</b>	<b>Presumed</b>	-	<b>200 m<sup>2</sup></b>	<b>Good</b>	<b>A</b>	<b>Non-Friable</b>	<b>Action 4 or 6</b>	<b>Routine surveillance. Type 1 abatement if required.</b>	<b>Photo 1</b>
<b>2009 DSS (Not observed in 2019)</b>											
AS-01-A,B,C	Texture coat	First floor kitchen	-	-	-	-	-	-	-	-	-
AS-02-A,B,C	1' x 1' ceiling tile	First floor storage room ceiling	-	-	-	-	-	-	-	-	-
AS-03-A,B,C	Stucco	First floor living room	-	-	-	-	-	-	-	-	-
AS-04-A,B,C,D,E	Plaster	First floor den	-	-	-	-	-	-	-	-	-





**SURVEY FINDINGS**

Sample ID	Sample Description	Location	Asbestos Content	Historic Results	Quantity <sup>1</sup>	Condition <sup>2</sup>	Accessibility <sup>3</sup>	Friability <sup>4</sup>	Action Level <sup>5</sup> (Urgency Level <sup>6</sup> )	Comments	Photo
AS-05-A,B,C	2' x 4' ceiling tile	First floor den ceiling	-	-	-	-	-	-	-	-	-

**Notes:**

**ND** Asbestos not detected.

**Bold** Asbestos containing material with a concentration equal to or greater than 0.5% asbestos.

- Quantity is provided for only materials found or suspected to be asbestos-containing.
- Condition is ranked as Good, Fair, or Poor in accordance with PCA Asbestos Management Guide – 2014.
- Accessibility is rated (for friable, asbestos-containing samples only) as discussed in Section 4.3.3:
  - A - Areas of the building within reach (from floor level) of all building users;
  - B - Frequently entered maintenance areas within reach of maintenance staff, without the need of a ladder;
  - C (exposed) - Areas of the building above 2.4 m where use of a ladder is required to reach the asbestos-containing material;
  - C (concealed) - Areas of the building that require the removal of a building component, including lay-in ceilings and access panels into solid ceiling systems;
  - D - Areas of the building behind inaccessible solid ceiling systems, walls or mechanical equipment etc. where demolition of the ceiling, wall or equipment, etc. is required to reach the asbestos containing material.
- Friability is assessed as friable or non-friable.
- Action Level is ranked based on PCA Asbestos Management Guide – 2014 as discussed in Section 4.3.3:
  - ACTION 1 Immediate clean-up of debris that is likely to be disturbed;
  - ACTION 2 Limit/Restrict entry into areas where ACM is present and likely to be disturbed by access, or where ACM debris is present, until ACM or ACM debris is removed;
  - ACTION 3 ACM removal;
  - ACTION 4 Optional ACM removal (cost/benefit analysis);
  - ACTION 5 ACM repair (Arrange for repair ACM found in FAIR condition, and not likely to be damaged again or disturbed by normal use of the area or room. Upon completion of the repair work, treat ACM as material in GOOD condition and implement ACTION 6. If ACM is likely to be damaged or disturbed, during normal use of the area or room, implement ACTION 4); and
  - ACTION 6 Routine surveillance.
- Urgency Level: Identified for ACMs in poor condition only. Additional information provided in Section 6.0 for each material.
  - (High): Immediate repairs required.
  - (Moderate): Repairs required.

**Table 6 Summary of Suspect Lead-Based Paint Results**

Sample Number	Description	Location	Concentration Lead, Parts per million (ppm)	Historic Results (ppm)	Approximate Quantity (square metres)	Condition	Action Level (Urgency Level)	Photo
<b>2018 DSHMS</b>								
614104-1-P-1	Teal paint	Second floor office walls and ceiling	1,000	-	50 m <sup>2</sup>	Poor	Remove chipped or flaking paint and paint over damaged areas (Moderate)	Photo 2
614104-1-P-2	Brown paint	First floor living room moulding and trim	31,000	-	15 m <sup>2</sup>	Good	None	Photo 3
614104-1-P-3	Yellow paint	First floor washroom trim	42,000	-	5 m <sup>2</sup>	Good	None	Photo 4
614104-1-P-4	Lilac paint	Second floor washroom walls	5,600	-	15 m <sup>2</sup>	Poor	Remove chipped or flaking paint and paint over damaged areas (Moderate)	Photo 5
614104-1-P-5	Brown paint	Second floor bedroom 1 wood floors	420	-	10 m <sup>2</sup>	Poor	Remove chipped or flaking paint and paint over damaged areas (Moderate)	Photo 6
614104-1-P-6	Pink paint	Second floor bedroom 3 window frame, moulding, and trim	32,000	-	5 m <sup>2</sup>	Fair	Remove chipped or flaking paint and paint over damaged areas	Photo 7
614104-1-P-7	White paint	Basement walls	<81	-	-	-	-	-
<b>2009 DSS</b>								
LS-01	White paint	Basement	-	<160	-	-	-	-
LS-02	Purple/blue paint	Kitchen	-	31,000	-	-	-	-
LS-03	White paint	Storage room, both washrooms, all three bedrooms, and hallway	-	47,000	-	-	-	-



**SURVEY FINDINGS**

Sample Number	Description	Location	Concentration Lead, Parts per million (ppm)	Historic Results (ppm)	Approximate Quantity (square metres)	Condition	Action Level (Urgency Level)	Photo
<p><b>Notes:</b></p> <p><b>Bold</b> Lead-based paint with a concentration equal to or greater than 90 ppm.</p> <p>Urgency Level: Identified for lead-based paint in poor condition only. Additional information provided in Section 6.0 for each material.</p> <p>(High): Immediate repairs required.</p> <p>(Moderate): Repairs required.</p> <p>-: Not applicable</p>								

Table A-1 provides a summary of the results of the asbestos analysis and presumed ACM for the subject building. Table A-2 provides a summary of the paint samples analysed for lead in the surveyed areas within the subject building. Table A-3 provides a summary of mercury-containing equipment observed within the subject building. Tables A-1 to A-3 are presented in Appendix A.

Figure 1 identifies the sample collection locations for both ACM and lead-based paint on the first floor of the subject building. Figure 2 identifies the sample collection locations for both ACM and lead-based paint on the second floor of the subject building. Figure 3 identifies the sample collection locations for lead-based paint in the basement. Figure 4 identifies the location of the confirmed designated substances on the first floor. Figure 5 identifies the location of the confirmed designated substances on the second floor. Figure 6 identifies the location of the confirmed designated substances in the basement.

Laboratory certificates of analysis from the laboratory are provided in Appendix B. Select photographs showing the designated substance locations within the building are presented in Appendix C and identified on Tables 5 and 6, above.

## **6. DISCUSSION AND RECOMMENDATIONS**

Lead-based paint were confirmed in select samples collected from the building. Building materials or equipment suspected to contain mercury and silica were observed at the subject building. Furnace oil was stored in an AST located in the basement, used for heating purposes. Based on the conditions observed, building materials containing designated substances or potentially hazardous materials can remain in place provided they are managed accordingly and not damaged or disturbed.

Prior to any demolition or renovation activities, PCA, and their selected contractors must ensure that the materials are properly handled and disposed of in accordance with the PCA Asbestos Management Guide as applicable, OHSA and associated regulations, as summarized below.

### ***Asbestos-Containing Materials***

The laboratory results indicated that there are no ACMs. It should be noted that roofing materials were not collected due to the height and safety precautions; however, some roofing materials are known to have been manufactured with asbestos and therefore these materials are presumed to be ACM.

Airborne asbestos fibres can be generated through such processes as drilling, grinding, cutting, and abrading non-friable asbestos-containing material, or by crumbling or deteriorating friable asbestos-containing materials. Precautions must be taken to prevent asbestos-containing particles from becoming airborne during the application of such processes. All handling and removal of asbestos should be conducted as specified in O. Reg. 278/05 (amended to O. Reg. 493/09) and PCA Guide.

The type of repair and/or removal procedures to be conducted is defined on a case-by-case basis. Prior to disturbance, sample all roofing material layers to confirm ACM or undertake Type 1 abatement if required. All ACM materials should remain undisturbed by building occupants.

Any suspect material encountered should be treated as asbestos-containing unless otherwise indicated by sampling and analytical testing. If additional asbestos materials (currently hidden or inaccessible) are identified as future renovation or demolition work proceeds, these materials should be examined, tested, and handled appropriately. Any asbestos removal should be completed by a trained abatement contractor.

### ***Lead***

In 2009, three paint samples were collected and submitted to a laboratory for lead analysis. Two of the paint samples were found to be lead-based with concentrations of 31,000 ppm and 47,000 ppm. One paint was too well adhered to the wall to collect a sufficient sample volume for analysis to meet the lead reporting limit, and is therefore considered potentially lead-based.

In 2019, seven paint samples were collected and submitted for lead analysis. Six of these paint samples were found to be lead-based with concentrations ranging from 420 ppm to 42,000 ppm. At the time of the survey, teal paint throughout the second floor office, lilac paint on the second floor washroom walls, and brown paint on the second floor bedroom 1 wood floors were in poor condition and had areas of flaking

or peeling paint. Lead-based paints in poor condition had concentrations ranging between 420 ppm and 5,600 ppm. Because the subject building is unoccupied, the urgency level for repair is considered moderate.

If lead-based paints are not flaking, they may be painted over to reduce further deterioration. Flaking paints should be cleaned up or removed to limit the potential for the spread of lead dust, including the use of a drop-sheet and a HEPA filter equipped vacuum. This should be done following, at minimum, Type 1 procedures as outlined in the MOL guideline “*Lead on Construction Projects*” dated April 2011. Lead based paints should not be disturbed by sanding, heat gun removal etc. as this leads to airborne lead. If paint is to be disturbed, the MOL guideline “*Lead on Construction Projects*” dated April 2011, outlines a classification system and control measures to limit worker exposure and should be consulted. In particular, if flaking paints are to be removed by scraping or sanding using non-powered hand tools, the use of a half-mask particulate respirator with N-, R-, or P-series filter and 95, 99, or 100% efficiency is recommended.

During any demolition or renovation activities, lead based paints should be managed in accordance with O. Reg. 490/09 and the MOL guideline “*Lead on Construction Projects*” dated April 2011. Any suspect lead-based paint encountered should be treated as such unless otherwise indicated by sampling and analytical testing. If additional lead-based paint (currently hidden or inaccessible) is identified, these materials should be examined, tested, and handled appropriately.

Given the age of the building, it is possible that some of the plumbing might contain lead-based solder and/or lead-based pipe. Disturbance of lead based materials should be managed to ensure lead dust is not generated during any demolition or renovation activities. During any demolition or renovation activities, these materials should be managed in accordance with O. Reg. 490/09. If the materials are not to be recycled, the materials should be disposed of in accordance with O. Reg. 347 as amended.

### **Mercury**

Small quantities of mercury are present in a thermostat in the first floor kitchen. No samples were collected or submitted for laboratory analysis. There is no occupational or environmental concern associated with the small amount of mercury that might be present in the thermostat. Prior to any demolition or renovations to the building, the fluorescent lights that may be disturbed must be handled and if necessary, disposed of in accordance with O. Reg. 490/09 (as amended).

### **Mould**

Approximately half a square metre (0.5m<sup>2</sup>) of suspect mould was observed on the north wall of the second floor washroom and one square metre (1m<sup>2</sup>) of suspect mould was observed in the walls and ceiling in the southwest corner of the second floor bedroom 2. No samples were collected or submitted for laboratory analysis. A mould investigation is recommended to confirm presence and/ or extent of mould impact. Small areas of mould <1 square meter should be cleaned with a soap and water or bleach solution or suitable commercial mould cleaner. Larger areas of mould should be abated in accordance with “*Mould Abatement Guidelines*,” Environmental Abatement Council of Ontario (EACO), Edition (3) 2015.

**Silica**

Concrete and mortar-based building materials were observed at the building and are likely to contain silica. Exposure to airborne silica is regulated under O. Reg. 490/09 (as amended). Airborne silica can be generated through such processes as drilling, grinding, cutting, and abrading silica-containing material. Precautions must be taken to prevent silica-containing particles from becoming airborne during the application of such processes. Such precautions include wetting of silica-containing area(s) to be disturbed and daily wet sweeping or HEPA vacuuming of silica dust. Additionally, appropriate respiratory protection, personal protective clothing, hand and face washing, and ventilation must be utilized during disturbance of silica-containing structures.

**Fuel, Oil, and Waste Oil Storage (Containing Benzene)**

A 909 L fuel oil AST was located on the second floor covered porch. Furnace oil is benzene-containing. All fuels and oils should be stored in accordance with the Storage Tank Systems for Petroleum Products and Allied Petroleum Products (SOR/2008-197) requirements.

## **7. LIMITATIONS**

Limited sampling of building materials and paints was undertaken as part of this investigation. As such, detailed investigations or testing in subsequent studies may encounter conditions not apparent at this time or at other locations. While every attempt was made to ensure that samples collected were representative of the general sampling area, it is possible that conditions outside specific sampling locations may differ. Therefore, users of this report are advised to observe conditions prior to conducting any demolition or renovation activities. COLE Engineering & XCG Consulting Joint Venture cannot be held responsible for conditions that were not apparent from documentation supplied to COLE Engineering & XCG Consulting Joint Venture.

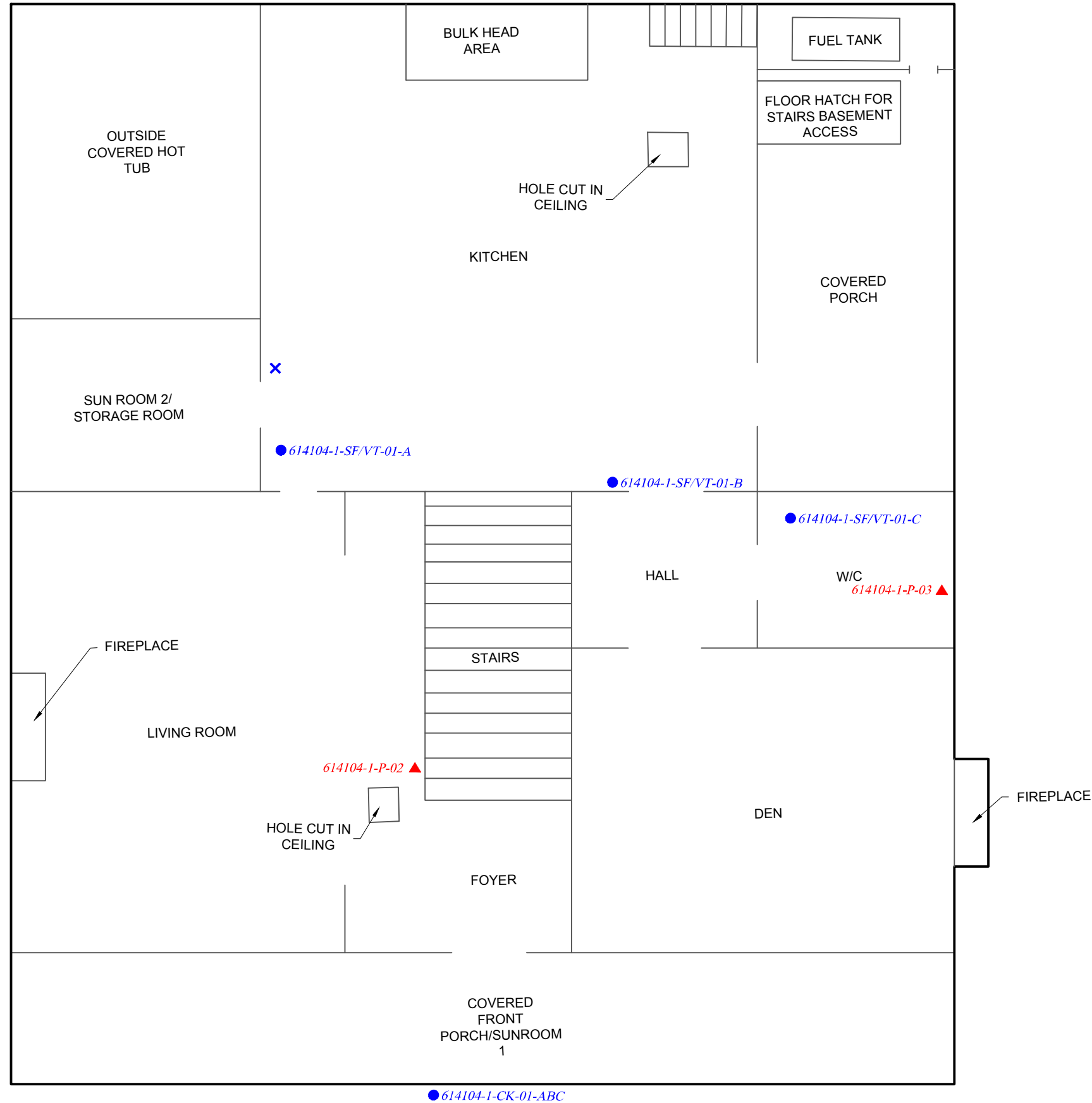
The conclusions presented in this report are professional opinions based on visual observations, limited information provided by persons familiar with the subject building and analytical results. As such, COLE Engineering & XCG Consulting Joint Venture cannot be held responsible for environmental conditions at the building that were not apparent from the available information.

The scope of this work is limited to the matters expressly covered. This report is prepared for the sole benefit of the current owner and the current owner's authorized contractors, and should not be relied upon by any other person or entity. The scope of services performed in the execution of this investigation may not be appropriate to satisfy the needs of other users, and any use or reuse of this document or the findings and conclusions represented herein is at the sole risk of the said users.





**8. FIGURES**



- NON-ASBESTOS CONTAINING SAMPLES
- CONFIRMED ASBESTOS CONTAINING SAMPLES
- ▲ PAINT SAMPLES NOT EXCEEDING LEAD STANDARDS
- ▲ CONFIRMED LEAD CONTAINING PAINT SAMPLES
- × MERCURY THERMOSTAT



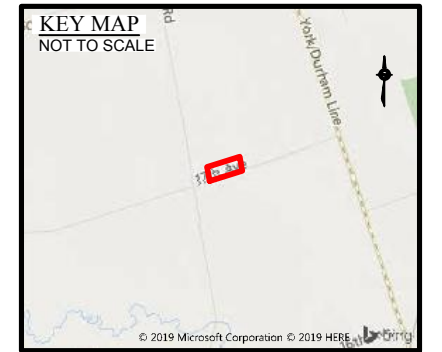
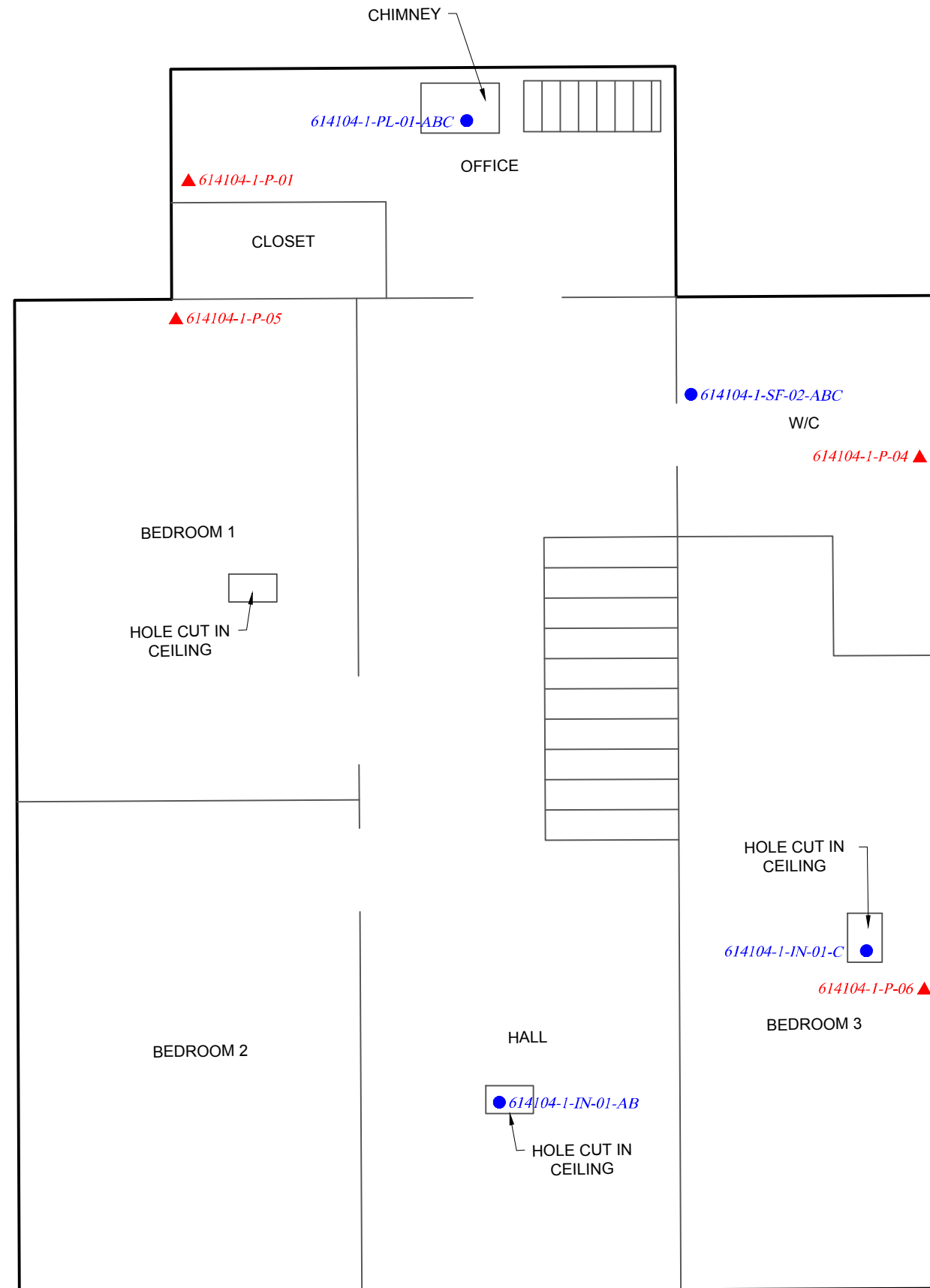
NOT TO SCALE

SAMPLING LOCATIONS  
FIRST FLOOR

PIN 614104-1  
7630 Major Mackenzie Dr.  
MARKHAM, ONTARIO



DATE	JOB NO.	FIGURE NO.
MAR. 2019	2018-0565	1



- NON-ASBESTOS CONTAINING SAMPLES
- CONFIRMED ASBESTOS CONTAINING SAMPLES
- ▲ PAINT SAMPLES NOT EXCEEDING LEAD STANDARDS
- ▲ CONFIRMED LEAD CONTAINING PAINT SAMPLES



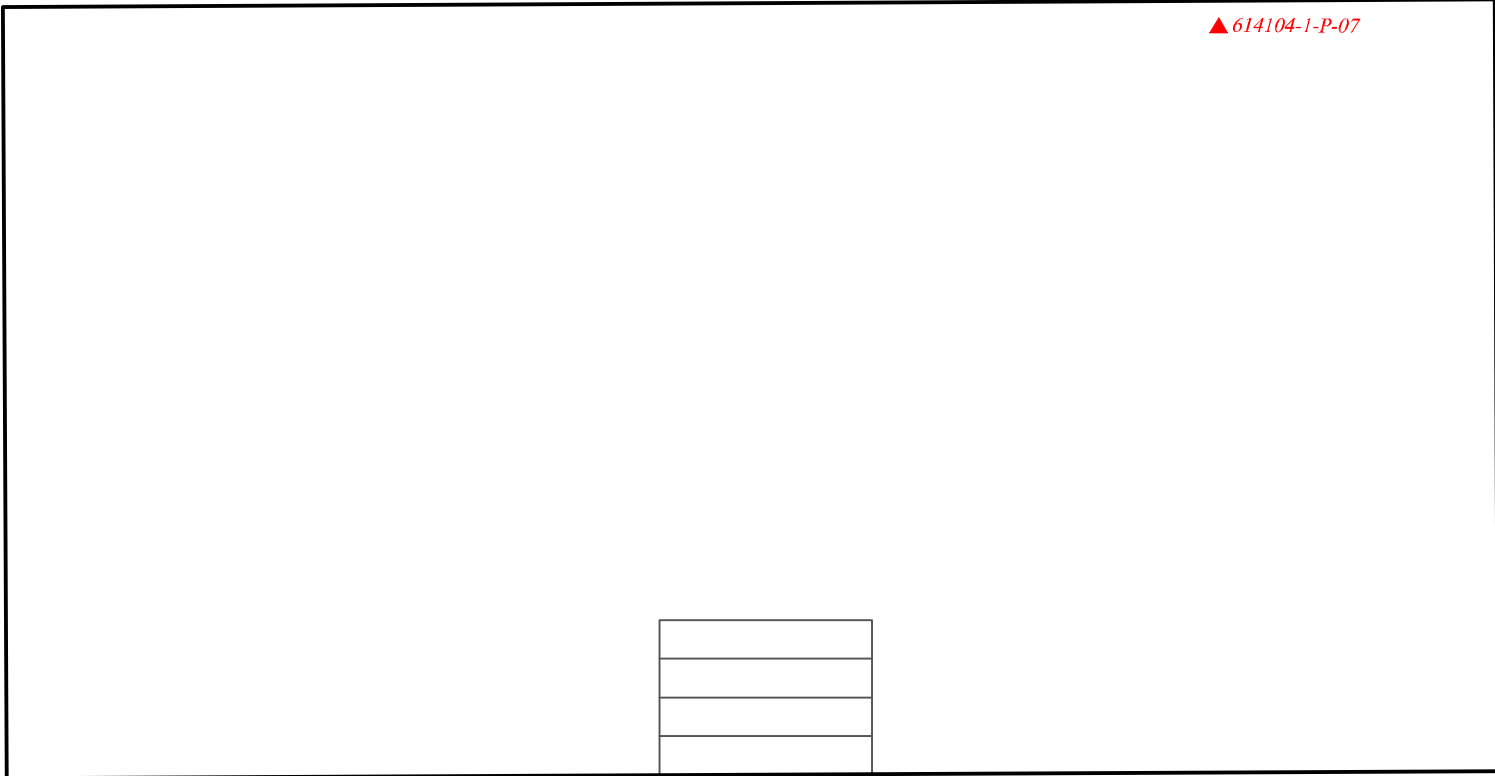
NOT TO SCALE

SAMPLING LOCATIONS  
SECOND FLOOR

PIN 614104-1  
7630 Major Mackenzie Dr.  
MARKHAM, ONTARIO



DATE	JOB NO.	FIGURE NO.
MAR. 2019	2018-0565	2



- NON-ASBESTOS CONTAINING SAMPLES
- CONFIRMED ASBESTOS CONTAINING SAMPLES
- ▲ PAINT SAMPLES NOT EXCEEDING LEAD STANDARDS
- ▲ CONFIRMED LEAD CONTAINING PAINT SAMPLES



NOT TO SCALE

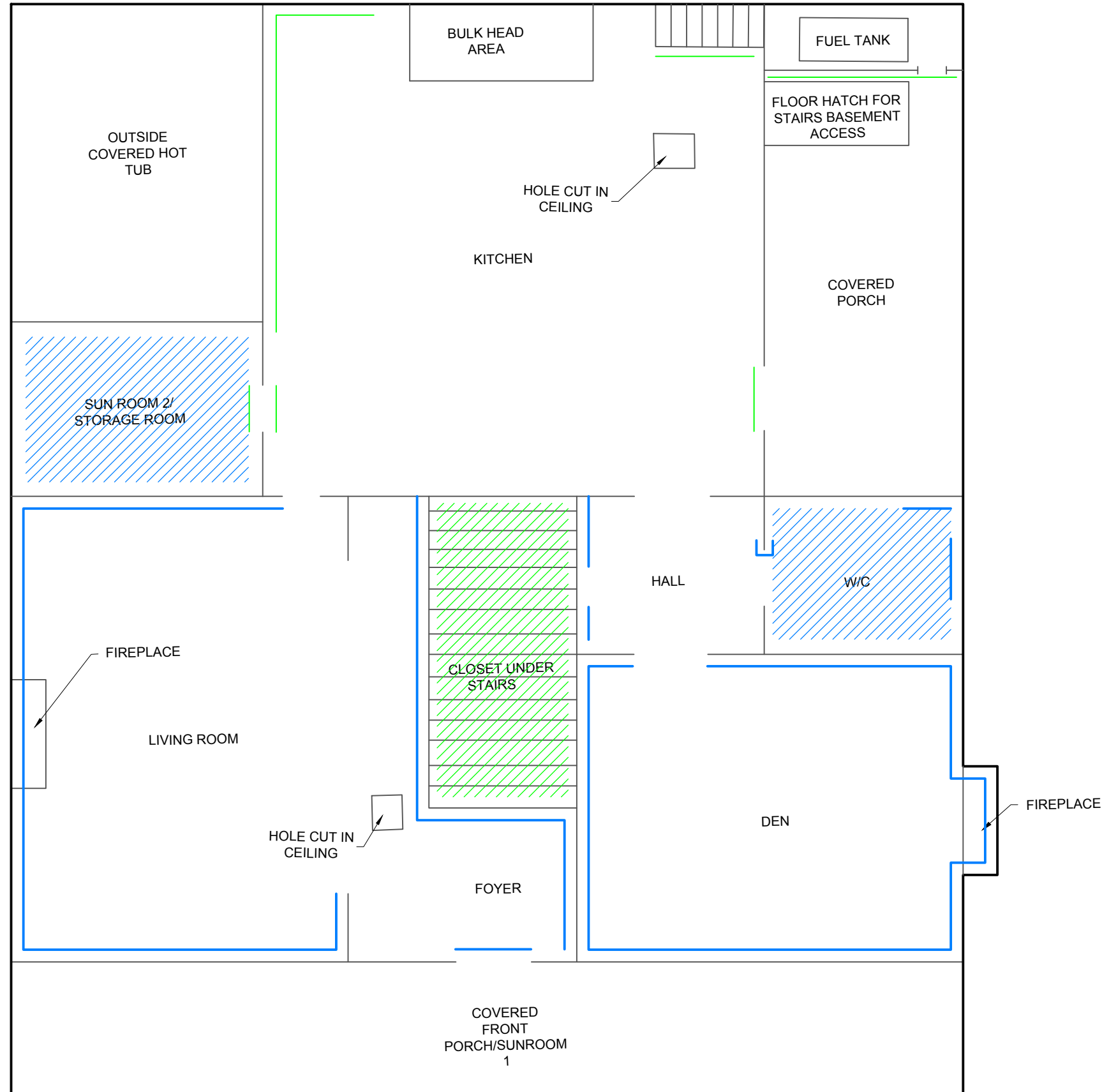
SAMPLING LOCATIONS  
BASEMENT

PIN 614104-1  
7630 Major Mackenzie Dr.  
MARKHAM, ONTARIO



DATE	JOB NO.	FIGURE NO.
MAR. 2019	2018-0565	3

DRAWING REFERENCE: Figure based on York Region online mapping and COLE field notes.  
NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.



- CONFIRMED LEAD CONTAINING PAINT (WINDOW, TRIM AND MOULDING)
- CONFIRMED LEAD CONTAINING PAINT (DOOR, CABINET AND TRIM) HISTORICAL SAMPLE
- CONFIRMED LEAD CONTAINING PAINT (CEILING) HISTORICAL SAMPLE
- CONFIRMED LEAD CONTAINING PAINT (STAIRS AND RAILING)



NOT TO SCALE

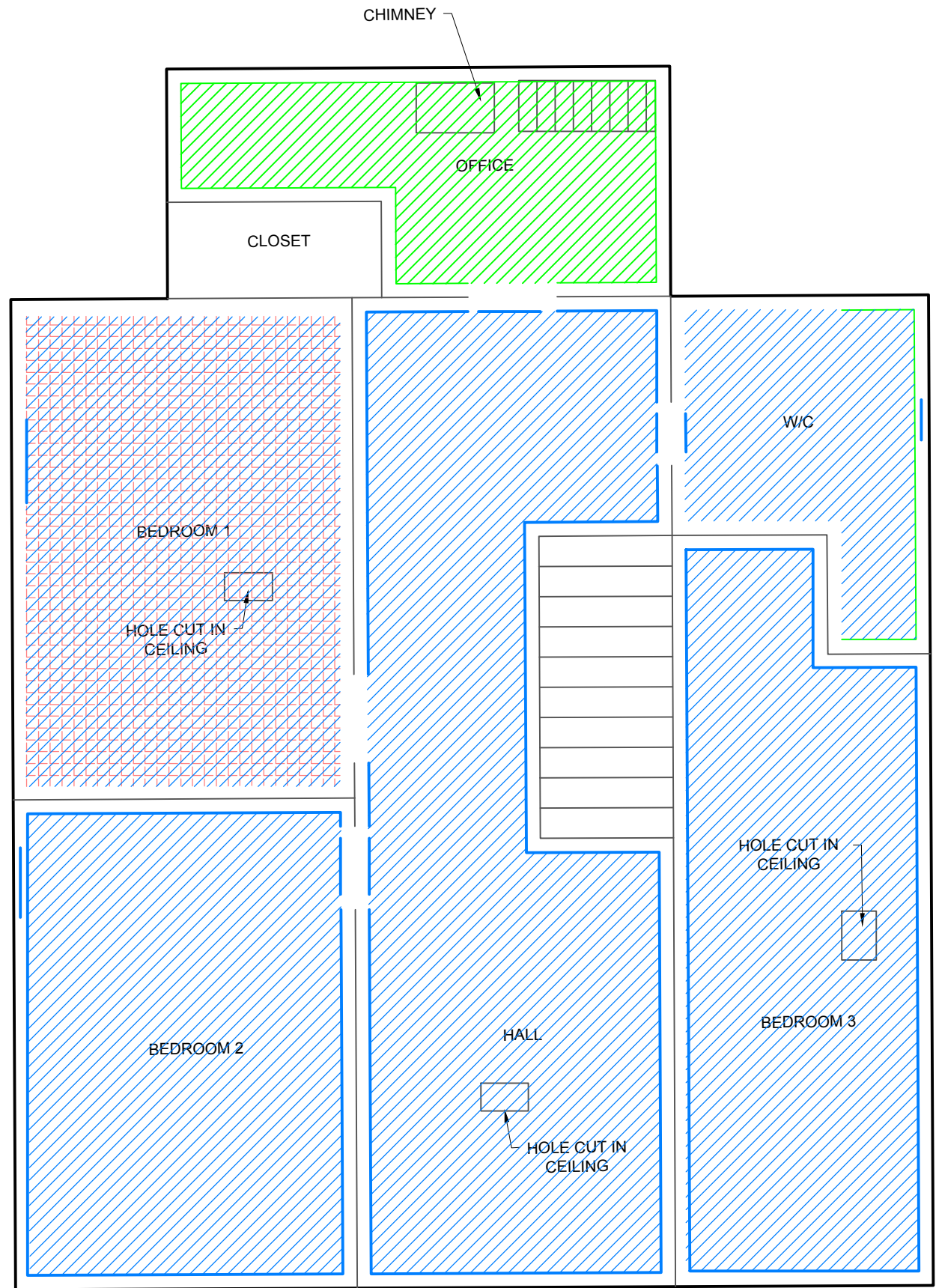
DSS LOCATIONS  
FIRST FLOOR




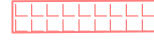

PIN 614104-1  
7630 Major Mackenzie Dr.  
MARKHAM, ONTARIO



DATE	JOB NO.	FIGURE NO.
MAR. 2019	2018-0565	4

DRAWING REFERENCE: Figure based on York Region online mapping and COLE field notes.  
NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.



-  CONFIRMED LEAD CONTAINING PAINT (WALL)
-  CONFIRMED LEAD CONTAINING PAINT (WINDOW AND TRIM)
-  CONFIRMED LEAD CONTAINING PAINT (CEILING)
-  CONFIRMED LEAD CONTAINING PAINT (FLOOR)
-  CONFIRMED LEAD CONTAINING PAINT (CEILING) HISTORICAL SAMPLE



NOT TO SCALE

DSS LOCATIONS  
SECOND FLOOR

PIN 614104-1  
7630 Major Mackenzie Dr.  
MARKHAM, ONTARIO



DATE	JOB NO.	FIGURE NO.
MAR. 2019	2018-0565	5

DRAWING REFERENCE: Figure based on York Region online mapping and COLE field notes.  
NOTE: Location of building, underground utilities, etc. are for reference only and should not be relied upon for detailed design, renovation, or construction purposes. Property boundary and building locations shown may not represent actual surveyed boundaries.



**APPENDIX A**  
**TABLES**

# Asbestos Inventory - 7630 Major Mackenzie Drive East, Markham

Location Reference	Floor	Room	Specific Location	Material Description	Accessibility	Friability (Friable, Non-Friable)	Asbestos Type	% Present	Condition (Good, Fair, Poor, Abated, None)	Approximate Quantity	Sample I.D.	Date	Control Action (Urgency Level)	Comments
614104-1	Exterior	Exterior	Roof	Roofing materials	A	Non-Friable	-	Presumed	Good	200 m <sup>2</sup>	-	30-Jan-19	Action 4 or 6 – routine surveillance. Type 1 abatement if required.	

Notes:  
 1. Asbestos disturbance, abatement, transportation, and disposal shall be performed in accordance with requirements of (O.Reg. 278/05, O.Reg. 347/09).  
 2. All quantities, as provided, are approximations. Quantities, conditions, and locations of asbestos-containing materials are to be confirmed on-site by contractors prior to project bidding, removal or disturbance.  
 3. The survey did not include an intrusive, destructive investigation for concealed materials in every room. As a result, materials that may be present behind or above solid building material finishes are not included as part of the above database, unless otherwise stated.  
 4. '-' indicates 'not applicable'.  
 5. Urgency levels identified for ACMs in poor condition only. High: Immediate repairs required. Moderate: Repairs required.



## Lead Paint Inventory - 7630 Major Mackenzie Drive East, Markham

Location Reference	Floor	Room	Specific Location	Material Description	Lead Content (ppm)	Condition (Good, Fair, Poor, Abated, None)	Approximate Quantity	Sample I.D.	Date	Recommendation (Urgency Level)	Comments
614104-1	Second	Office	Walls and ceiling	Teal paint	1,000	Poor	50 m <sup>2</sup>	614104-1-P-1	30-Jan-19	Remove chipped or flaking paint and paint over damaged areas (Moderate)	Visually similar paint to den and bedroom 3
614104-1	First	Living room	Moulding and trim, stair rails and steps	Brown paint	31,000	Good	15 m <sup>2</sup>	614104-1-P-2	30-Jan-19	-	Visually similar paint on moulding and trim in 1st floor foyer and second floor hallway trim and door frames
614104-1	First	Washroom	Trim	Yellow paint	42,000	Good	5 m <sup>2</sup>	614104-1-P-3	30-Jan-19	-	
614104-1	Second	Washroom	Walls	Lilac paint	5,600	Poor	15 m <sup>2</sup>	614104-1-P-4	30-Jan-19	Remove chipped or flaking paint and paint over damaged areas (Moderate)	
614104-1	Second	Bedroom 1	Wood floors	Brown paint	420	Poor	10 m <sup>2</sup>	614104-1-P-5	30-Jan-19	Remove chipped or flaking paint and paint over damaged areas (Moderate)	
614104-1	First Floor	Kitchen	Doors, cabinet, and trim	Purple/blue paint	31,000	-	-	LS-02	7-Oct-09	-	
614104-1	First and Second	Storage room, both washrooms, all three bedrooms, and hallway	Doors and ceilings	White paint	47,000	-	-	LS-03	7-Oct-09	-	

**Notes:**

1. Lead disturbance, abatement, transportation and disposal shall be performed in accordance with requirements of O. Reg. 490/09, as amended, O. Reg. 347, as amended, and the Ontario Ministry of Labour "Guideline – Lead on Construction Projects," dated April 2011.
2. All quantities, as provided, are approximations. Quantities, conditions, and locations of lead-based materials are to be confirmed on-site by contractors prior to project bidding, removal or disturbance.
3. The survey did not include an intrusive, destructive investigation for concealed materials in every room. As a result, materials that may be present behind or above solid building material finishes are not included as part of the above database, unless otherwise stated.
4. '-' indicates 'not applicable'.
5. Urgency levels identified for paints in poor condition only. High: Immediate repairs required. Moderate: Repairs required.

## Mercury/PCB Inventory - 7630 Major Mackenzie Drive East, Markham

Location Reference	Floor	Room	Specific Location	Material Description	Equipment Type	Approximate Quantity	Date	Control Action	Comments
614104-1	First	Kitchen	Wall	Mercury	Thermostat	30-Jan-19	30-Jan-19	Handled and if necessary, disposed of in accordance with O. Reg. 490/09 (as amended).	

Notes:  
 1. The survey did not include an intrusive, destructive investigation for concealed materials in every room. As a result, materials that may be present behind or above solid building material finishes are not included as part of the above database, unless otherwise stated.  
 - Not applicable



***APPENDIX B***  
***LABORATORY CERTIFICATES OF ANALYSIS***



# EMSL Canada Inc.

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<http://www.EMSL.com> / [torontolab@emsl.com](mailto:torontolab@emsl.com)

EMSL Canada Order 551901441  
 Customer ID: 55XCGC34  
 Customer PO: RNUP  
 Project ID: RNUP

**Attn:** Rhona Scott  
 XCG Consulting Limited  
 820 Trillium Dr.  
 Kitchener, ON N2R 1K4

**Phone:** (519) 741-5774  
**Fax:** (519) 741-5627  
**Collected:** 1/30/2019  
**Received:** 2/07/2019  
**Analyzed:** 2/14/2019

**Proj:** 5-336-200-01 - 614104-1 (RNUP)

## Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

**Client Sample ID:** 614104-1-IN-1A **Lab Sample ID:** 551901441-0001

**Sample Description:** Insulation - Attic

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/14/2019	Tan	75.0%	25.0%	None Detected	

**Client Sample ID:** 614104-1-IN-1B **Lab Sample ID:** 551901441-0002

**Sample Description:** Insulation - Attic

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/14/2019	Tan	75.0%	25.0%	None Detected	

**Client Sample ID:** 614104-1-IN-1C **Lab Sample ID:** 551901441-0003

**Sample Description:** Insulation - Attic

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/14/2019	Tan	80.0%	20.0%	None Detected	

**Client Sample ID:** 614104-1-SF/VT-1A-Vinyl Floor Tile **Lab Sample ID:** 551901441-0004

**Sample Description:** Sheet Flooring Layer 1, Vinyl Tile (layer 2)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
TEM Grav. Reduction	2/13/2019	Gray	0.0%	100.0%	None Detected	

**Client Sample ID:** 614104-1-SF/VT-1A-Sheet Flooring **Lab Sample ID:** 551901441-0004A

**Sample Description:** Sheet Flooring Layer 1, Vinyl Tile (layer 2)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
TEM Grav. Reduction	2/13/2019	Gray	0.0%	100.0%	None Detected	

**Client Sample ID:** 614104-1-SF/VT-1B-Vinyl Floor Tile **Lab Sample ID:** 551901441-0005

**Sample Description:** Sheet Flooring Layer 1, Vinyl Tile (layer 2)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
TEM Grav. Reduction	2/13/2019	Gray	0.0%	100.0%	None Detected	

**Client Sample ID:** 614104-1-SF/VT-1B-Sheet Flooring **Lab Sample ID:** 551901441-0005A

**Sample Description:** Sheet Flooring Layer 1, Vinyl Tile (layer 2)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
TEM Grav. Reduction	2/13/2019	Gray	0.0%	100.0%	None Detected	



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<http://www.EMSL.com> / [torontolab@emsl.com](mailto:torontolab@emsl.com)

EMSL Canada Order 551901441  
Customer ID: 55XCGC34  
Customer PO: RNUP  
Project ID: RNUP

## Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

**Client Sample ID:** 614104-1-SF/VT-1C-Vinyl Floor Tile **Lab Sample ID:** 551901441-0006  
**Sample Description:** Sheet Flooring Layer 1, Vinyl Tile (layer 2)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
TEM Grav. Reduction	2/13/2019	Gray	0.0%	100.0%	None Detected	

**Client Sample ID:** 614104-1-SF/VT-1C-Sheet Flooring **Lab Sample ID:** 551901441-0006A  
**Sample Description:** Sheet Flooring Layer 1, Vinyl Tile (layer 2)

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
TEM Grav. Reduction	2/13/2019	Gray	0.0%	100.0%	None Detected	

**Client Sample ID:** 614104-1-PL-1A **Lab Sample ID:** 551901441-0007  
**Sample Description:** Plaster 2nd FL Office

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/14/2019	Tan	0.0%	100.0%	None Detected	

**Client Sample ID:** 614104-1-PL-1B-Plaster **Lab Sample ID:** 551901441-0008  
**Sample Description:** Plaster 2nd FL Office

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/14/2019	Tan	0.0%	100.0%	None Detected	

**Client Sample ID:** 614104-1-PL-1B-Tar **Lab Sample ID:** 551901441-0008A  
**Sample Description:** Plaster 2nd FL Office

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/14/2019	Black	0.0%	100.0%	None Detected	

**Client Sample ID:** 614104-1-PL-1C-Plaster **Lab Sample ID:** 551901441-0009  
**Sample Description:** Plaster 2nd FL Office

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/14/2019	Tan	0.0%	100.0%	None Detected	

**Client Sample ID:** 614104-1-PL-1C-Tar **Lab Sample ID:** 551901441-0009A  
**Sample Description:** Plaster 2nd FL Office

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/14/2019	Black	0.0%	100.0%	None Detected	

**Client Sample ID:** 614104-1-SF-2A **Lab Sample ID:** 551901441-0010  
**Sample Description:** Sheet Flooring , 2nd Floor Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
TEM Grav. Reduction	2/13/2019	Gray	0.0%	100.0%	None Detected	



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EMSL Canada Order 551901441  
Customer ID: 55XCGC34  
Customer PO: RNUP  
Project ID: RNUP

## Test Report: Asbestos Analysis of Bulk Materials for Ontario Regulation 278/05 via EPA600/R-93/116 Method

**Client Sample ID:** 614104-1-SF-2B **Lab Sample ID:** 551901441-0011  
**Sample Description:** Sheet Flooring , 2nd Floor Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
TEM Grav. Reduction	2/13/2019	Gray	0.0%	100.0%	None Detected	

**Client Sample ID:** 614104-1-SF-2C **Lab Sample ID:** 551901441-0012  
**Sample Description:** Sheet Flooring , 2nd Floor Washroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
TEM Grav. Reduction	2/13/2019	Gray	0.0%	100.0%	None Detected	

**Client Sample ID:** 614104-1-CK-1A **Lab Sample ID:** 551901441-0013  
**Sample Description:** White Caulking, Exterior Sunroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/14/2019	White	0.0%	100.0%	None Detected	

**Client Sample ID:** 614104-1-CK-1B **Lab Sample ID:** 551901441-0014  
**Sample Description:** White Caulking, Exterior Sunroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/14/2019	White	0.0%	100.0%	None Detected	

**Client Sample ID:** 614104-1-CK-1C **Lab Sample ID:** 551901441-0015  
**Sample Description:** White Caulking, Exterior Sunroom

TEST	Analyzed Date	Color	Non-Asbestos		Asbestos	Comment
			Fibrous	Non-Fibrous		
PLM	2/14/2019	White	0.0%	100.0%	None Detected	

### Analyst(s):

- Caroline Allen PLM (7)
- Michelle Lung PLM (4)
- Natalie D'Amico TEM Grav. Reduction (9)

### Reviewed and approved by:

Matthew Davis or other approved signatory  
or Other Approved Signatory

None Detected = <0.1%. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted. This report must not be used to claim product endorsement by NVLAP of any agency of the U.S. Government.

Samples analyzed by EMSL Canada Inc. Mississauga, ON NVLAP Lab Code 200877-0

Initial report from: 02/14/2019 14:22:47

**EMSL Canada Inc.**

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EMSL Canada Or 551901434

CustomerID: 55XCGC34

CustomerPO: RNUP

ProjectID: RNUP

Attn: **Rhona Scott**  
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**820 Trillium Dr.**  
**Kitchener, ON N2R 1K4**

Phone: (519) 741-5774  
 Fax: (519) 741-5627  
 Received: 02/07/19 3:04 PM  
 Collected: 1/30/2019

Project: 5-336-200-01-614104-1

**Test Report: Lead in Paint Chips by Flame AAS (SW 846 3050B/7000B)\***

<i>Client SampleDescription</i>	<i>Collected</i>	<i>Analyzed</i>	<i>Weight</i>	<i>RDL</i>	<i>Lead Concentration</i>
614104-1-P-1 551901434-0001	1/30/2019	2/11/2019	0.2448 g	82 ppm	1000 ppm
	Site: Teal - 2nd FI Office Walls				
614104-1-P-2 551901434-0002	1/30/2019	2/11/2019	0.1968 g	1000 ppm	31000 ppm
	Site: Brown - Living Rm Moulding				
614104-1-P-3 551901434-0003	1/30/2019	2/11/2019	0.2213 g	1800 ppm	42000 ppm
	Site: Yellow - Bathroom 1st FI Trim				
614104-1-P-4 551901434-0004	1/30/2019	2/11/2019	0.2456 g	410 ppm	5600 ppm
	Site: Lilac - Bathroom 2nd FI Walls				
614104-1-P-5 551901434-0005	1/30/2019	2/11/2019	0.2452 g	82 ppm	420 ppm
	Site: Brown - Bedroom 1 - Floor				
614104-1-P-6 551901434-0006	1/30/2019	2/11/2019	0.2443 g	1600 ppm	32000 ppm
	Site: Pink - Bedroom 3 - Window Trim				
614104-1-P-7 551901434-0007	1/30/2019	2/11/2019	0.2455 g	81 ppm	<81 ppm
	Site: White - Basement Wall				

Rowena Fanto, Lead Supervisor  
 or other approved signatory

\*Analysis following Lead in Paint by EMSL SOP/Determination of Environmental Lead by FLAA. Reporting limit is 0.010 % wt based on the minimum sample weight per our SOP. Unless noted, results in this report are not blank corrected. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities. Samples received in good condition unless otherwise noted. "<" (less than) result signifies that the analyte was not detected at or above the reporting limit. Measurement of uncertainty is available upon request. The QC data associated with the sample results included in this report meet the recovery and precision requirements unless specifically indicated otherwise. Definitions of modifications are available upon request.

Samples analyzed by EMSL Canada Inc. Mississauga, ON A2LA Accredited Cert #2845.08; AIHA-LAP, LLC - ELLAP #196142

Initial report from 02/14/2019 09:49:22



**APPENDIX C**  
**SITE PHOTOGRAPHS**





**Photo 1: View of the exterior of the subject building and suspected ACM roofing materials.**



**Photo 2: View of the teal lead-based paint in the second floor office.**



**Photo 3: View of the brown lead-based paint on the first floor living room moulding and trim.**



**Photo 4: View of the yellow lead-based paint on the first floor washroom trim.**



**Photo 5: View of the lilac lead-based paint on the second floor washroom walls.**



**Photo 6: View of the second floor bedroom 1 carpet under which there is brown lead-based paint on the wood floors.**



**Photo 7: View of pink lead-based paint on second floor bedroom 3 window frame and trim.**



**Photo 8: View of mercury-containing thermostat in the first floor kitchen.**



**Photo 9: View of 909 L fuel oil above-ground storage tank on the second floor covered porch.**



**Photo 10: View of suspect mould on second floor bedroom 2 walls and ceiling.**