Prepared for:
Contact:
Lt. Ken Akerman
Client Name and Address :
Salt Spring Island Fire Rescue
105 Lower Ganges Road
Salt Spring Island, BC V8K 2T1

Limited Hazardous Materials Assessment

Salt Spring Island Firehall No. 1
105 Lower Ganges Road, Salt Spring Island, BC

Prepared by:

North West Environmental Group Ltd.

201-415 Gorge Road East
Victoria, British Columbia V8T 2W1

Project No. 30875 HMA1 V1.0
Date issued: December 13th 2016

EXECUTIVE SUMMARY

North West Environmental Group Ltd. (NWest) conducted a limited project-specific hazardous materials assessment at Salt Spring Island Fire Hall No.1, 105 Lower Ganges Road, Salt Spring Island, BC for Salt Spring Island Fire Rescue (the Client) in accordance with the WorkSafeBC regulatory requirements outlined in the BC Occupational Health and Safety Regulation Section 20.112 – Hazardous Materials. The assessment was conducted by Kathy Muirhead and William Roff on November 24th 2016. Building fabric components suspected of containing hazardous materials were identified, logged and, where necessary, sampled and analyzed to confirm the presence or absence of hazardous materials.

The building serves as a fire hall and was originally constructed in the 1960's with an addition taking place in the 1980's. Finishes within the building consist primarily of drywall, sheet flooring, and vinyl floor tile. The building is situated on a concrete foundation. The exterior was not assessed as a part of this assessment.

The client defined the assessment area as areas which are potentially impacted by water incursion as shown to the assessors during the site visit and are listed as follows:

- Gear Room where drywall ceiling (including joint compound) is delaminating
- Truck Bay where drywall ceiling and bulkheads along with mezzanine windows show signs of water incursion.
- Tank Room/Shop where ceiling skylight drywall is delaminating.
- Hose tower where wood work adjacent windows shows signs of water incursion.

Sampling was limited to drywall only in order to facilitate compliance with asbestos management and enable repair and/or investigation of water sources. If other materials not noted in this report must be disturbed or removed in order to repair any water ingress they must first be assessed by a qualified person.

Invasive investigative techniques were not used as the building was occupied.

WorkSafeBC Regulation 20.112 requires that all hazardous materials found to be in the way of planned work, including asbestos, be identified prior to the commencement of construction and/or renovation work. These hazardous materials must be either safely contained or removed by a qualified contractor employing WorkSafeBC approved procedures. If materials that are suspected of containing hazardous components such as lead or asbestos, are encountered during deconstruction that differ from, or are in addition to those reported in the bulk sample collection report, then work must stop until the material content can be determined.

The purpose of this hazard assessment was to identify the locations of asbestos and other hazardous materials prior to planned renovation/demolition work. This report includes a list of building materials that are confirmed or suspected of containing hazardous materials.

The following table summarizes the observations and results of the assessment. See Section 4 in this report for recommendations.

Table 0-1: Hazmat Assessment Observations and Results*

Hazardous Material	Type
PCBs	• Fluorescent Light Ballasts not observed in the way of planned work
Asbestos* (confirmed)	• Drywall Joint Compound – Throughout ↳ Chrysotile 1.8-2.5%
Asbestos (may contain)	• Based upon drywall work being isolated to limited areas, the majority of locations did not contain any suspected asbestos containing materials. • Where wall repair must occur, insulation may be present in wall cavities.
Mercury	• Fluorescent Light Tubes were observed in way of planned work • Mercury thermostats and other equipment such as manometers not observed in the way of planned work
Ozone Depleting Substances	• ODS not observed in the way of planned work
Radioactive Materials	• Smoke Detectors not observed in the way of planned work
Above Ground Storage Tanks (AST)	• AST not observed in the way of planned work
Lead	• Lead concentrations in analyzed paint was found to be below the regulated concentration.
Hantavirus – Rodent Droppings	• Evidence of rodent presence not observed in the way of planned work
Silica	• Silica is present in drywall and any other cementitious building materials.
Mould	• Water damage that may be supporting mould growth observed • Mould growth was detected on the samples collected.
Flammables/Explosive Materials	• Flammables and explosives were not observed.

Where hazardous materials were found they can be presumed to be found in similar materials throughout the building.

***Warning:** in the event any additional suspect hazardous materials 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 hazardous material. If any material suspected of containing asbestos or another hazardous material is disturbed during the work, all work shall STOP until the area is contained, the hazard evaluated by a qualified professional and the hazardous materials, if indeed present, is safely managed by a qualified contractor.*

Limitations

Following conditions/materials were not included in this assessment:

- Radon testing is not included in the scope of this project.
- Underground systems were not assessed for hazardous materials.
- A Stage I Environmental Site Assessment is beyond the scope of this project.

- Personal and/or occupant contents were not assessed.
- Leachate analysis was not conducted of lead-containing paint.
- Attic or above ceiling insulation was not assessed during this assessment.
- Insulation that could be present in the wall cavities was not assessed during this assessment.

TABLE OF CONTENTS

1 Introduction 1

2 Site Condition and Scope of Work 1

2.1 Limitations 2

3 Findings 2

3.1 Polychlorinated Biphenyls (PCB) 2

3.2 Asbestos 3

3.2.1 Bulk Samples 3

3.3 Mercury 3

3.4 Ozone-depleting Substances (CFCs/ODS) 3

3.5 Radioactive Materials 4

3.6 Aboveground Storage Tanks 4

3.7 Lead 4

3.7.1 Lead Paint 4

3.7.2 Elemental Lead 4

3.8 Hantavirus – Rodent Droppings 4

3.9 Silica 4

3.10 Mould 5

3.11 Flammable and Explosive Materials 5

4 Recommendations 6

5 Closure 8

Appendix A. Photo Plates A-1

Appendix B. Sample Analysis Report B-1

Appendix C. Sample Locations C-1

Appendix D. Regulatory Criteria D-1

Appendix E. Methodology E-1

TABLE OF FIGURES

Table 0-1: Hazmat Assessment Observations and Results* ii

Table 3-1: Asbestos Containing Materials 3

Table 3-2: Lead Containing Coatings 4

Table 3-2: Mould Samples 5

Table 5-1: ACGIH / WorkSafeBC Exposure Limits D-5

Table 5-2: Recommended lead clearance criteria for surfaces D-5

1 INTRODUCTION

North West Environmental Group Ltd. (NWest) conducted a limited project-specific hazardous materials assessment at Salt Spring Island Fire Hall No.1, 105 Lower Ganges Road, Salt Spring Island, BC for Salt Spring Island Fire Rescue (the Client) in accordance with WorkSafeBC regulatory requirements outlined in the BC Occupational Health and Safety Regulation Section 20.112 – Hazardous Materials. The assessment was conducted by Kathy Muirhead and William Roff on November 24th 2016. This is a project-specific assessment intended to identify building materials and equipment containing hazardous materials that may be impacted by the renovation or demolition work planned for the building. The scope of the assessment was limited to areas impacted by proposed work identified to NWest by the client.

WorkSafeBC Regulations require that all hazardous materials including asbestos be removed prior to demolition or protected from damage prior to the commencement of construction and/or demolition/renovation work. Removal or disturbance of hazardous materials must be undertaken by a qualified contractor employing WorkSafeBC approved procedures. If materials are encountered during deconstruction that differ from, or are in addition to those described in this report, then work must stop until the material content can be determined and appropriate precautionary measures employed to protect workers and others at or near the worksite.

2 SITE CONDITION AND SCOPE OF WORK

The client defined the scope of work to be the following:

The area assessed included:

- Gear Room where drywall ceiling (including joint compound) is delaminating
- Truck Bay where drywall ceiling and bulkheads along with mezzanine windows show signs of water incursion.
- Tank Room/Shop where ceiling skylight drywall is delaminating.
- Hose tower where wood work adjacent windows shows signs of water incursion.

Sampling was limited to drywall only in order to facilitate compliance with asbestos management and enable repair and/or investigation of water sources. If other materials not identified in this report must be disturbed removed in order to repair any water ingress they must first be assessed by a qualified person.

Summary of the building:

Age of Construction	1960's with renovation in 1980's
Number of Storeys	One with mezzanine and storage room; hose tower is 3-5 stories in height.
Foundation	Concrete
Structural Frame	Wood Frame
Exterior Finishes	Not assessed.

Insulation	Not assessed.
Structural Floor	Concrete with raised areas.
Roofing	Not assessed.
Interior Finishes	• Gear Room – drywall ceiling • Truck Bay – drywall ceiling, wood framed windows • Tank Room/Shop – drywall skylight • Hose tower – wood
Heating and Ventilation	Radiant baseboard heating, unit heaters.
Electrical and Lighting	Wired outlets, florescent lighting
Fire Protection	Fire extinguishers and smoke detectors

2.1 Limitations

As per WorkSafeBC requirements all accessible areas of this building in the assessment area were visually assessed for the presence of asbestos-containing materials, mould, lead, radioactive sources, ozone depleting substances, mercury, flammables and explosives, PCBs and above-ground fuel storage tanks.

Invasive investigative techniques were not used as the building was occupied.

Following conditions/materials were not included in this assessment:

- Radon testing is not included in the scope of this project.
- Underground systems were not assessed for hazardous materials.
- A Stage I Environmental Site Assessment is beyond the scope of this project.
- Personal and/or occupant contents were not assessed.
- Leachate analysis was not conducted of lead-containing paint.
- Attic or above ceiling insulation was not assessed during this assessment.
- Insulation that could be present in the wall cavities was not assessed during this assessment.

Hazardous materials may be present at the subject site that were not visible, accessible or available for inspection during the assessment and are therefore not described in this report.

3 FINDINGS

Refer to Section 4.0 for handling and disposal recommendations relating to the findings in this report. Photographs of representative materials are located in Appendix A. Copies of the analytical laboratory reports are provided in Appendix B. Drawings outlining sample locations are included Appendix C, and regulatory criteria for hazardous materials handling and disposal are found in Appendix 5.

3.1 Polychlorinated Biphenyls (PCB)

Fluorescent light fixtures were not observed in the way of planned work.

3.2 Asbestos

3.2.1 Bulk Samples

All accessible areas of the building that could be disturbed by planned work were inspected for building materials suspected of containing asbestos. Bulk samples of building materials were collected in accordance with WorkSafeBC requirements and analyzed to determine the type and approximate content of asbestos.

The following table summarizes the analytical results of samples collected during this assessment which were found to be asbestos-containing. All visually similar materials throughout the building must be considered to be asbestos containing.

See Appendix B for a complete list of materials analyzed for asbestos content. See Appendix C for a site plan showing sample locations.

Table 3-1: Asbestos Containing Materials

Material	Locations Found in Assessment Area	Percentage and Type of Asbestos	Estimated Quantities
Drywall Joint Compound	Throughout	1.8 – 2.5 % Chrysotile	500 ft^2

**Estimated Quantity is an estimate of observable asbestos-containing materials. Concealed or otherwise inaccessible materials may not have been included in this estimate.*

Note 1: In the event that suspected hazardous materials are encountered during demolition activities, work on those materials must STOP immediately and the materials must remain undisturbed until testing determines their status. In the event that the materials have been damaged or otherwise impacted, all work shall STOP until appropriate controls can be put in place to protect workers and the public.

Materials suspected of containing asbestos may be in the way of planned work but were not observed as they may have been concealed or were otherwise inaccessible:

- electrical cables,
- buried asbestos cement pipes,
- bell and spigot pipe sealants/oakum, and
- incandescent light fixtures (heat shields).

3.3 Mercury

Mercury-containing thermostats, and compact fluorescent light (CFL) bulbs were not observed in the way of planned work. Fuorescent light tubes were present and contain mercury vapour.

3.4 Ozone-depleting Substances (CFCs/ODS)

Equipment that may use chlorofluorocarbons (CFCs) or ozone-depleting substances (ODS) was not observed in the way of planned work.

3.5 Radioactive Materials

Smoke detectors containing sealed 241Americium sources were not observed in the way of planned work.

Radon was not tested for as it was beyond the scope of this project.

3.6 Aboveground Storage Tanks

No aboveground tanks were observed near the area of the site where the planned work will be undertaken.

3.7 Lead

3.7.1 Lead Paint

The following table summarizes the lead content found in paint chips sampled during the assessment.

Table 3-2: Lead Containing Coatings

Sample #	Location	Description	Lead Concentration % by Weight	Lead Concentration mg/kg
Surface Coating Materials Regulation Threshold			**0.009**	90
30875-15	Tank Room/Shop Skylight on Drywall	White Paint	0.0082	82

***Bolded** concentrations shown in the table above meet or exceed the criteria for paint considered lead-containing. Special handling may be required in order to protect workers from lead exposure, depending on planned work procedures.

* Red highlighted concentrations shown in the table above meet or exceed 100 mg/kg (100 ppm), the threshold limit which triggers a requirement for leachate (TCLP) analysis prior to disposal (Reference US Environmental Protection Agency (US EPA) Analysis Method EPA SW846-(1311) TCLP, Section 1.2.). Lead paint on metal substrates does not require this testing if the materials are recycled as metal construction waste.

3.7.2 Elemental Lead

Sources of elemental lead were not observed in the way of planned work.

Lead within the copper water pipes/fittings was not tested for lead content; however, lead solder was used on copper pipes until the early 1990's, so is likely present in this building.

3.8 Hantavirus – Rodent Droppings

Visual evidence of rodent presence was not observed in the way of planned work.

3.9 Silica

All concrete, cement, mortar, drywall, plaster, ceramic tiles, stucco and any other cementitious building materials are suspected of containing silica in crystalline and non-crystalline forms.

3.10 Mould

Mould was observed in the way of planned work. A summary of investigate samples collected is presented in Table 3-3 below.

Table 3-3: Mould Samples

Sample #	Location	Description	Spore Type	Count/per area analyzed
30875-12	Truck Bay – Mezzanine Window	Biotape Slide Lift	None Detected	None Detected
30875-13	Tank Room/Shop – Skylight	Biotape Slide Lift	Cladosporium	*High*

Rare: 1 to 10; Low: 11 to 100; Medium: 101 to 1000; High: >1000

*=Sample contains fruiting structures and/or hyphae associated with the spores.

3.11 Flammable and Explosive Materials

Flammables and explosives were not observed in water damaged areas.

4 RECOMMENDATIONS

Based on the findings, the recommendations are:

1. Damaged **Asbestos** materials are present in locations defined in the scope of work. Repair and monitor in place immediately.

2. Provide copies of this report to site personnel, including contractors. A copy of the assessment must be immediately available at the site whenever workers are present. Site personnel need to have read and understood the content of this report prior to commencement of any work which may disturb building materials and contents.

3. Engage in the services of a qualified engineer to assess the building for the impacts of water incursion and provide recommendations for repair.

4. The contractor shall have an exposure control plan/safe work procedures in place for each hazardous substance identified in this report as being in way of the planned work.

5. Work must STOP if previously unidentified suspected hazardous materials are encountered during renovations and/or demolition activities. These suspect materials must be left undisturbed until testing determines their status. Work must also STOP in the event that these suspect materials have been damaged or otherwise impacted. Contact NWest for further direction.

6. **Asbestos:** All asbestos containing materials with the potential to be impacted by the work must be removed or protected from damage prior to the commencement of construction and/or demolition work. This work, called asbestos abatement, must be undertaken by trained personnel following procedures acceptable to WorkSafeBC which comply with the BC Occupational Health and Safety Regulation and conform to the WorkSafeBC document, “Safe Practices for Handling Asbestos”.

7. **Silica** (crystalline): Safe Work Procedures including the use of adequate personal protective equipment (PPE) must be in place prior to commencing the work. Workers must use caution to avoid creating airborne silica dust while working on, otherwise disturbing or removing concrete, drywall, plaster, ceramic tile, stucco or any other cementitious material. Use wetting techniques and/or HEPA equipped extraction systems attached to drills and other power equipment where possible in order to decrease dust levels.

8. **Mould**: Mould growth and/or water damage that may be supporting mould growth was observed in a number of areas throughout the building and varied in the amount and extent. In select locations where accessible, this suspected growth was confirmed with tape lift sampling. Should selective removal of water damaged or mould-impacted materials occur prior to renovation activities, the mould remediation protocol outlined in the Canadian Construction Association document, “Mould Guidelines for the Canadian Construction Industry,” CCA82-2004 must be observed. A qualified environmental consultant should be engaged to assess the effectiveness of remediation activities prior to reinstatement of materials. In the event that demolition will be conducted using heavy equipment, ensure that the equipment operator and any workers near the demolition site are protected from exposure to airborne mould and other contaminants.

9. **See Appendix D** – Regulatory Criteria for further information regarding the safe handling or management practices for hazardous materials.

5 CLOSURE

This assessment and assessment report has been prepared exclusively for the client. It is a statement of the presence of the listed hazardous materials as outlined in the report and as observed on the date of this assessment. The conclusions and recommendations contained in this assessment report are based upon professional opinions with regard to the subject matter. These opinions are in accordance with accepted hygiene 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, hidden or inaccessible conditions, 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 data reported and the findings, observations and conclusions expressed in this report are limited by the Scope of Work. The Scope of Work was defined by the request of the client, the time and budgetary constraints imposed by the client, and availability of access to the properties.

Because of the limitations stated above, the findings, observations and conclusions expressed by NWest in this report are not, and should not be, considered an opinion concerning compliance of any past or present owner or operator of the site with any federal, provincial or local laws or regulations.

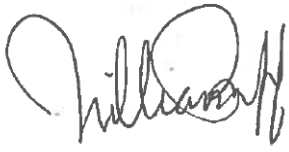
No warranty or guarantee, whether expressed or implied, is made with respect to the data or the reported findings, observations, and conclusions, which are based solely upon site conditions in existence at the time of this assessment.

This report may not be used, relied upon, copied, published, or quoted by any party without the written consent of NWest. Other parties reading this report must independently verify the completeness and accuracy of this report and its contents.

This report is not intended for use as a scope of work for removal or as a specification section for inclusion in Tender Documents. Any unauthorized use of this report in that fashion is at the sole discretion and liability of the Owner.

North West Environmental Group Ltd.

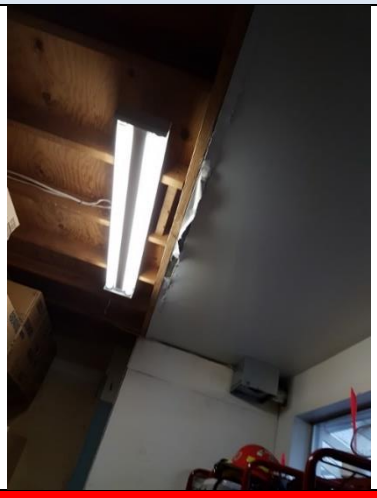
Kathy Muirhead, B.Sc. EP (OHS)
Senior Project Manager
Qualified person as per OHS Reg 6.1
Report Review

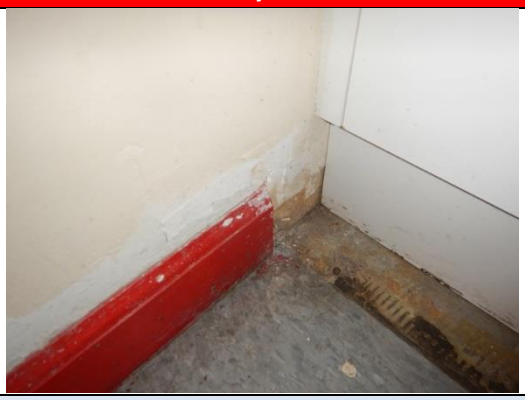


William Roff, B.Sc.
Project Manager
Report Author

Appendix A. PHOTO PLATES

The following photo plates provide a general documentation of the building materials that were sampled and analyzed during the assessment. It is meant to summarize the results of analysis and observations and is not intended to include all hazardous materials, or their locations, observed during the assessment.

<table>
<tr>
<td> 
</td>
<td>  </td>
</tr>
<tr>
<td>Sample: 30875-01
Location: Truck Bay
Description: Drywall Joint Compound
Hazardous Material: Chrysotile Asbestos 1.8%</td>
<td>Sample: 30875-02
Location: Tank Room/Shop - Skylight
Description: Drywall Joint Compound
Hazardous Material: Chrysotile Asbestos 1.9%</td>
</tr>
<tr>
<td>  </td>
<td>  </td>
</tr>
<tr>
<td>Sample: 30875-03
Location: Furnace Room
Description: Drywall Joint Compound
Hazardous Material: Chrysotile Asbestos 2.1%</td>
<td>Sample: 30875-04
Location: Gear Room
Description: Drywall Joint Compound
Hazardous Material: Chrysotile Asbestos 2.2%</td>
</tr>
</table>

	
Sample: 30875-05 Location: Truck Bay - Mezzanine Description: Drywall Joint Compound Hazardous Material: No Asbestos Detected	**Sample: 30875-06** **Location: Truck Bay – Mezzanine Column** **Description: Drywall Joint Compound** **Hazardous Material: Chrysotile Asbestos 1.8%**
	
Sample: 30875-07 Location: Office Area – Exterior Wall Description: Drywall Joint Compound Hazardous Material: No Asbestos Detected	**Sample: 30875-08** **Location: Training Room** **Description: Drywall Joint Compound** **Hazardous Material: Chrysotile Asbestos 2.4%**
	
Sample: 30875-09 **Location: Trustee's Room** **Description: Drywall Joint Compound** **Hazardous Material: Chrysotile Asbestos 2.5%**	Sample: 30875-10 Location: Lounge Description: Drywall Joint Compound Hazardous Material: None Detected

	
Sample: 30875-11 Location: Display Room Description: Drywall Joint Compound Hazardous Material: No asbestos detected.	Sample: 30875-12 Location: Truck Bay Mezzanine Description: Tape Lift Mould: None detected
	
Sample: 30875-13 **Location: Tank Room/Shop - Skylight** **Description: Tape Lift** **Mould Spore Type: *Cladosporium* *High***	Sample: 30875-15 Location: Location: Tank Room/Shop - Skylight Description: White Paint Lead: 82 mg/kg

Appendix B. SAMPLE ANALYSIS REPORT

iATL INTERNATIONAL
ASBESTOS TESTING LABORATORIES

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: North West Environmental Group Ltd.
201 - 415 Gorge Road East
Victoria BC V8T 2W1

Client: NOR765

Report Date: 11/29/2016
Report No.: 524708 - PLM
Project: SSI Firehall - Site Review and Limited Sampling
Project No.: 30875

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6090966 **Client No.:** 30875-1	**Description:** Off-White Joint Compound **Facility:**	**Location:** Truck Bay-East Wall By Ext. Door
Percent Asbestos: ***PC 1.8*** *Chrysotile*	Percent Non-Asbestos Fibrous Material: None Detected	Percent Non-Fibrous Material: 98.2
Lab No.: 6090967 **Client No.:** 30875-2	**Description:** Off-White Joint Compound **Facility:**	**Location:** Tank Room/Shop-Skylight
Percent Asbestos: ***PC 1.9*** *Chrysotile*	Percent Non-Asbestos Fibrous Material: None Detected	Percent Non-Fibrous Material: 98.1
Lab No.: 6090968 **Client No.:** 30875-3	**Description:** Off-White Joint Compound **Facility:**	**Location:** Furnace Room/Elec Wall
Percent Asbestos: ***PC 2.1*** *Chrysotile*	Percent Non-Asbestos Fibrous Material: None Detected	Percent Non-Fibrous Material: 97.9
Lab No.: 6090969 **Client No.:** 30875-4	**Description:** Off-White Joint Compound **Facility:**	**Location:** Gear Room-Ceiling
Percent Asbestos: ***PC 2.2*** *Chrysotile*	Percent Non-Asbestos Fibrous Material: None Detected	Percent Non-Fibrous Material: 97.8
Lab No.: 6090970 **Client No.:** 30875-5	**Description:** White Joint Compound **Facility:**	**Location:** Truck Bay-Mezzanine Step
Percent Asbestos: *None Detected*	Percent Non-Asbestos Fibrous Material: None Detected	Percent Non-Fibrous Material: 100
Lab No.: 6090971 **Client No.:** 30875-6	**Description:** Off-White Joint Compound **Facility:**	**Location:** Truck Bay-Vertical Column
Percent Asbestos: ***PC 1.8*** *Chrysotile*	Percent Non-Asbestos Fibrous Material: None Detected	Percent Non-Fibrous Material: 98.2

Analytical Method -**US EPA 600, R93-116**. Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 11/28/2016
Date Analyzed: 11/29/2016
Signature:
Analyst: Shane Cone

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

iATL INTERNATIONAL
ASBESTOS TESTING LABORATORIES

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: North West Environmental Group Ltd.
201 - 415 Gorge Road East
Victoria BC V8T 2W1

Client: NOR765

Report Date: 11/29/2016
Report No.: 524708 - PLM
Project: SSI Firehall - Site Review and Limited Sampling
Project No.: 30875

PLM BULK SAMPLE ANALYSIS SUMMARY

Lab No.: 6090972 **Client No.:** 30875-7	**Description:** White Joint Compound **Facility:**	**Location:** Offices-Main Entrance-Exterior Wall
Percent Asbestos: *None Detected*	Percent Non-Asbestos Fibrous Material: None Detected	Percent Non-Fibrous Material: 100
Lab No.: 6090973 **Client No.:** 30875-8	**Description:** Off-White Joint Compound **Facility:**	**Location:** Training Room-Exterior Wall
Percent Asbestos: ***PC 2.4*** *Chrysotile*	Percent Non-Asbestos Fibrous Material: None Detected	Percent Non-Fibrous Material: 97.6
Lab No.: 6090974 **Client No.:** 30875-9	**Description:** Off-White Joint Compound **Facility:**	**Location:** Trustee's Room-Exterior Wall Above Ceiling
Percent Asbestos: ***PC 2.5*** *Chrysotile*	Percent Non-Asbestos Fibrous Material: None Detected	Percent Non-Fibrous Material: 97.5
Lab No.: 6090975 **Client No.:** 30875-10	**Description:** White Joint Compound **Facility:**	**Location:** Lounge/Dining Area
Percent Asbestos: *None Detected*	Percent Non-Asbestos Fibrous Material: None Detected	Percent Non-Fibrous Material: 100
Lab No.: 6090976 **Client No.:** 30875-11	**Description:** White Joint Compound **Facility:**	**Location:** Display Room-North Exterior Wall
Percent Asbestos: *None Detected*	Percent Non-Asbestos Fibrous Material: None Detected	Percent Non-Fibrous Material: 100

Analytical Method -**US EPA 600, R93-116**. Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 11/28/2016
Date Analyzed: 11/29/2016
Signature:
Analyst: Shane Cone

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

iATL INTERNATIONAL
ASBESTOS TESTING LABORATORIES

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: North West Environmental Group Ltd.
201 - 415 Gorge Road East
Victoria BC V8T 2W1

Client: NOR765

Report Date: 11/29/2016
Report No.: 524708 - PLM
Project: SSI Firehall - Site Review and Limited Sampling
Project No.: 30875

Appendix to Analytical Report

Customer Contact: Project Managers And Contact on COC
Analysis: US EPA 600, R93-116

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

iATL Customer Service: customerservice@iatl.com
iATL Office Manager: cdavis@iatl.com
iATL Account Representative: Shirley Clark
Sample Login Notes: See Batch Sheet Attached
Sample Matrix: Bulk Building Materials
Exceptions Noted: See Following Pages

General Terms, Warrants, Limits, Qualifiers:

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at www.iATL.com and in our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA LAP LLC, or any agency of local, state or province governments nor of any agency of the U.S. government.

This report shall not be reproduced except in full, without written approval of the laboratory.

Information Pertinent to this Report:

Analysis by US EPA 600 93-116: Determination of Asbestos in Bulk Building Materials by Polarized Light Microscopy (PLM).

Certifications:

- NIST-NVLAP No. 101165-0
- NY-DOH No. 11021
- AIHA-LAP, LLC No. 100188

Quantification at <0.25% by volume is possible with this method. (PC) Indicates Stratified Point Count Method performed. (PC-Trace) means that asbestos was detected but is not quantifiable under the Point Counting regimen. Analysis includes all distinct separable layers in accordance with EPA 600 Method. If not reported or otherwise noted, layer is either not present or the client has specifically requested that it not be analyzed (ex. analyze until positive instructions). Small asbestos fibers may be missed by PLM due to resolution limitations of the optical microscope. Therefore, PLM is not consistently reliable in detecting asbestos in non-friable organically bound (NOB) materials. Quantitative transmission electron microscopy (TEM) is currently the only method that can pronounce materials as non-asbestos containing.

Analytical Methodology Alternatives: Your initial request for analysis may not have accounted for recent advances in regulatory requirements or advances in technology that are routinely used in similar situations for other qualified projects. You may have the option to explore additional analysis for further information. Below are a few options, listed as the matrix followed by the appropriate methodology. Also included are links to more information on our website.

Bulk Building Materials that are Non-Friable Organically Bound (NOB) by Gravimetric Reduction techniques employing PLM and TEM: ELAP 198.6 (PLM-NOB), ELAP 198.4 (TEM-NOB)

Loose Fill Vermiculite Insulation, Attic Insulation, Zonolite (copyright), etc.: US EPA 600 R-4/004 (multi-tiered analytical process)
Sprayed On Insulation/Fireproofing with Vermiculite (SOF-V): ELAP 198.8 (PLM-SOF-V)>

Soil, sludge, sediment, aggregate, and like materials analyzed for asbestos or other elongated mineral particles (ex. erionite, etc.): ASTM D7521, CARB 435, and other options available

iATL INTERNATIONAL
ASBESTOS TESTING LABORATORIES

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: North West Environmental Group Ltd.
201 - 415 Gorge Road East
Victoria BC V8T 2W1

Client: NOR765

Report Date: 11/29/2016
Report No.: 524708 - PLM
Project: SSI Firehall - Site Review and Limited Sampling
Project No.: 30875

Asbestos in Surface Dust according to one of ASTM's Methods (very dependent on sampling collection technique – by TEM): ASTM D 5755, D5756, or D6480

Various other asbestos matrices (air, water, etc.) and analytical methods are available.

Disclaimers / Qualifiers:

There may be some samples in this project that have a "NOTE:" associated with a sample result. We use added disclaimers or qualifiers to inform the client about something that requires further explanation. Here is a list with highlighted disclaimers that may be pertinent to this project. For a full explanation of these and other disclaimers, please inquire at **customerservice@iatl.com**.

1) Note: No mastic provided for analysis.
2) Note: Insufficient mastic provided for analysis.
3) Note: Insufficient material provided for analysis.
4) Note: Insufficient sample provided for QC reanalysis.
5) Note: Different material than indicated on Sample Log / Description.
6) Note: Sample not submitted.
7) Note: Attached to asbestos containing material.
8) Note: Received wet.
9) Note: Possible surface contamination.
10) Note: Not building material. 1% threshold may not apply.
11) Note: Recommend TEM-NOB analysis as per EPA recommendations.
12) Note: Asbestos detected but not quantifiable.
13) Note: Multiple identical samples submitted, only one analyzed.
14) Note: Analyzed by EPA 600/R-93/116. Point Counting detection limit at 0.080%.
15) Note: Analyzed by EPA 600/R-93/116. Point Counting detection limit at 0.125%.

Recommendations for Vermiculite Analysis:

Several analytical protocols exist for the analysis of asbestos in vermiculite. These analytical approaches vary depending upon the nature of the vermiculite mineral being tested (e.g. un-processed gange, homogeneous exfoliated books of mica, or mixed mineral composites).Please contact your client representative for pricing and turnaround time options available.

iATL recommends initial testing using the EPA 600/R-93/116 method. This method is specifically designed for the analysis of asbestos in bulk building materials. It provides an acceptable starting point for primary screening of vermiculite for possible asbestos.

Results from this testing may be inconclusive. EPA suggests proceeding to a multi-tiered analysis involving wet separation techniques in conjunction with PLM and TEM gravimetric analysis (EPA 600/R-04/004).

Further information on this method and other vermiculite and asbestos issues can be found at the following: Agency for Toxic Substances and Disease Registry (ATSDR) www.atsdr.cdc.gov, United States Geological Survey (USGS) www.minerals.usgs.gov/minerals/, US EPA www.epa.gov/asbestos. The USEPA also has an informative brochure "Current Best Practices for Vermiculite Attic Insulation" EPA 747F03001 May 2003, that may assist the health and remediation professional.

The following is a summary of the analytical process outlines in the EPA 600/R-04/004 Method:

1)**Analytical Step/Method:** Initial Screening by PLM, EPA 600R-93/116
Requirements/Comments: Minimum of 0.1 g of sample. ~0.25% LOQ for most samples.

2)**Analytical Step/Method:** Wet Separation by PLM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Sinks" only.

3)**Analytical Step/Method:** Wet Separation by PLM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Floats" only.

4)**Analytical Step/Method:** Wet Separation by TEM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Sinks" only.

5)**Analytical Step/Method:** Wet Separation by TEM Gravimetric Technique, EPA R-04/004
Requirements/Comments: Minimum 50g** of dry sample. Analysis of "Suspension" only.

LOQ, Limit of Quantitation estimates for mass and volume analyses.
*With advance notice and confirmation by the laboratory.
**Approximately 1 Liter of sample in double-bagged container (~9x6 inch bag of sample).

iATL INTERNATIONAL
ASBESTOS TESTING LABORATORIES

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: North West Environmental Group Ltd.
201 - 415 Gorge Road East
Victoria BC V8T 2W1

Client: NOR765

Report Date: 12/2/2016
Report No.: 524729 - Lead Paint
Project: SSI Firehall - Site Review And Limited Sampling
Project No.: 30875

LEAD PAINT SAMPLE ANALYSIS SUMMARY

Lab No.: 6091092
Client No.: 30875-15

Description: White
Location: Tank Room/Shop-Skylight-On Drywall, 11-24-16

Result (% by Weight): 0.0082
Result (ppm): 82
Comments: ***

Please refer to the Appendix of this report for further information regarding your analysis.

Date Received: 11/28/2016
Date Analyzed: 12/02/2016
Signature:
Analyst: Chad Shaffer

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

iATL INTERNATIONAL
ASBESTOS TESTING LABORATORIES

9000 Commerce Parkway Suite B
Mt. Laurel, New Jersey 08054
Telephone: 856-231-9449
Email: customerservice@iatl.com

CERTIFICATE OF ANALYSIS

Client: North West Environmental Group Ltd.
201 - 415 Gorge Road East
Victoria BC V8T 2W1

Client: NOR765

Report Date: 12/2/2016
Report No.: 524729 - Lead Paint
Project: SSI Firehall - Site Review And Limited Sampling
Project No.: 30875

Appendix to Analytical Report:

Customer Contact: Project Managers And Contact on COC
Analysis: ASTM D3335-85a

This appendix seeks to promote greater understanding of any observations, exceptions, special instructions, or circumstances that the laboratory needs to communicate to the client concerning the above samples. The information below is used to help promote your ability to make the most informed decisions for you and your customers. Please note the following points of contact for any questions you may have.

iATL Customer Service: customerservice@iatl.com
iATL Office Manager: cdavis@iatl.com
iATL Account Representative: Shirley Clark
Sample Login Notes: See Batch Sheet Attached
Sample Matrix: Paint
Exceptions Noted: See Following Pages

General Terms, Warrants, Limits, Qualifiers:

General information about iATL capabilities and client/laboratory relationships and responsibilities are spelled out in iATL policies that are listed at www.iATL.com and in our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

iATL warrants the test results to be of a precision normal for the type and methodology employed for each sample submitted. iATL disclaims any other warrants, expressed or implied, including warranty of fitness for a particular purpose and warranty of merchantability. iATL accepts no legal responsibility for the purpose for which the client uses test results. Any analytical work performed must be governed by our Standard Terms and Conditions. Prices, methods and detection limits may be changed without notification. Please contact your Customer Service Representative for the most current information.

This confidential report relates only to those item(s) tested and does not represent an endorsement by NIST-NVLAP, AIHA LAP LLC, or any agency of local, state or province governments nor of any agency of the U.S. government.

This report shall not be reproduced except in full, without written approval of the laboratory.

Information Pertinent to this Report:

Analysis by ASTM D3335-85a by AAS

Certification:
- National Lead Laboratory Program (NLLAP): AIHA-LAP, LLC No. 100188
- NYSDOH-ELAP No. 11021

Regulatory limit is 0.5% lead by weight (EPA/HUD guidelines). Recommend multiple sampling for all samples less than regulatory limit for confirmation.
All results are based on the samples as received at the lab. iATL assumes that appropriate sampling methods have been used and that the data upon which these results are based have been accurately supplied by the client.
Method Detection Limit (MDL) per EPA Method 40CFR Part 136 Apendix B.
Reporting Limit (RL) based upon Lowest Standard Determined (LSD) in accordance with AIHA-ELLAP policies.
LSD=0.2 ppm MDL=0.005% by weight. RL= 0.010% by weight (based upon 100 mg sampled).

Disclaimers / Qualifiers:

There may be some samples in this project that have a "NOTE:" associated with a sample result. We use added disclaimers or qualifiers to inform the client about something that requires further explanation. Here is a complete list with highlighted disclaimers pertinent to this project. For a full explanation of these and other disclaimers, please inquire at **customerservice@iatl.com.**

* Insufficient sample provided to perform QC reanalysis (<200 mg)

** Not enough sample provided to analyze (<50 mg)

*** Matrix / substrate interference possible.

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Phone/Fax: (800) 220-3675 / (856) 786-0262
http://www.EMSL.com / cinnmicrolab@emsl.com

Order ID: 371623397
Customer ID: PAEC50
Customer PO:
Project ID:

Attn: All Reports
North West Environmental Group
201-415 Gorge Road East
Victoria, BC V8T 2W1

Phone: (250) 384-9695
Fax: (250) 384-9865
Collected: 11/25/2016
Received: 11/28/2016
Analyzed: 11/29/2016

Proj: Salt Spring Fire Rescue / 30875 / SSI Firehall-Site Review And Limited Sampling

Test Report: Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Tape Samples (EMSL Method: M041)

Lab Sample Number:	371623397-0001	371623397-0002	371623397-0003		
Client Sample ID:	30875-12	30875-13	30875-14		
Sample Location:	Truck Bay - Mezzanine Window	Tank Room/Shop - Skylight	Blank		
Spore Types	Category	Category	Category	-	-
Agrocybe/Coprinus	-	-	-	-	-
Alternaria	-	-	-	-	-
Ascospores	-	-	-	-	-
Aspergillus/Penicillium	-	-	-	-	-
Basidiospores	-	-	-	-	-
Bipolaris++	-	-	-	-	-
Chaetomium	-	-	-	-	-
Cladosporium	-	*High*	-	-	-
Curvularia	-	-	-	-	-
Epicoccum	-	-	-	-	-
Fusarium	-	-	-	-	-
Ganoderma	-	-	-	-	-
Myxomycetes++	-	-	-	-	-
Paecilomyces	-	-	-	-	-
Rust	-	-	-	-	-
Scopulariopsis	-	-	-	-	-
Stachybotrys	-	-	-	-	-
Torula	-	-	-	-	-
Ulocladium	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-
Zygomycetes	-	-	-	-	-
Fibrous Particulate	-	-	-	-	-
Hyphal Fragment	-	-	-	-	-
Insect Fragment	Medium	-	-	-	-
Pollen	-	-	-	-	-

Category: Count/per area analyzed
Rare: 1 to 10 Low: 11 to 100 Medium: 101 to 1000 High: >1000

Bipolaris++ = Bipolaris/Dreschlera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut
* = Sample contains fruiting structures and/or hyphae associated with the spores.

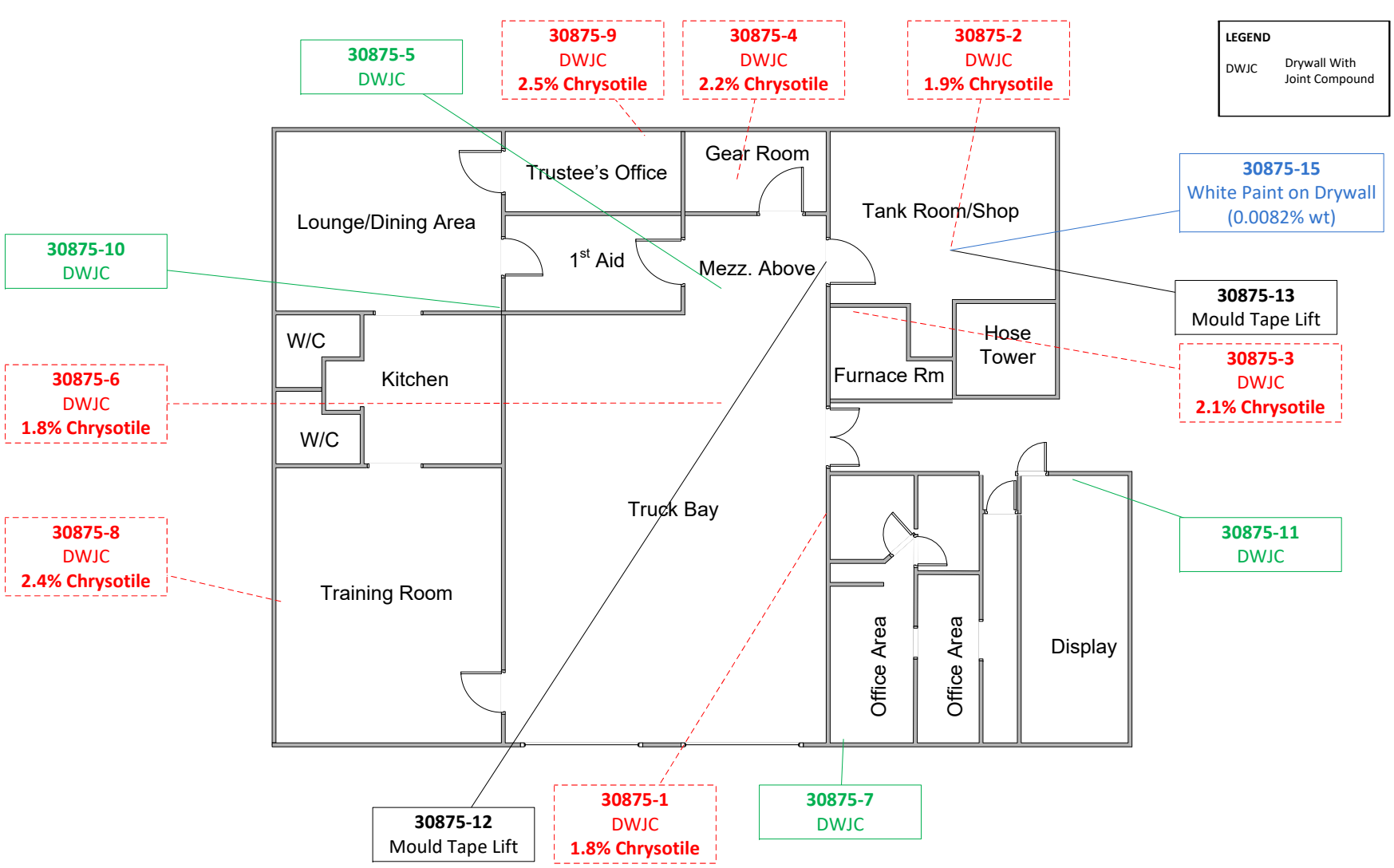
Farbod Nekouei, M.S., Laboratory Director
or Other Approved Signatory

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Accredited #100194

Initial report from: 11/30/2016 09:29:53

For Information on the fungi listed in this report please visit the Resources section at www.emsl.com

Appendix C. SAMPLE LOCATIONS



Drawing Not to Scale

Sample Result Key

123	No Asbestos Detected
123	Material Contains Asbestos
123	Lead (Pb) Sample

ADDRESS/LOCATION:
Salt Spring Island Fire Hall #1
105 Lower Ganges Road
Salt Spring Island, BC

DRAWING TITLE:
Sample Locations

PROJECT NO.: 30875

DATE: November 25, 2016

SURVEYED BY: WR & KM

DRAWING NO.: 001

North West Environmental Group Ltd.
#201 – 415 Gorge Road East
Victoria, BC V8T 2W1

Appendix D. REGULATORY CRITERIA

As per WorkSafeBC requirements, the building was assessed for the presence of several different types of hazardous materials including:

- Polychlorinated biphenyls
- Asbestos
- Mercury
- Ozone Depleting Substances
- Radioactive Materials
- Above or Underground Storage Tanks
- Lead
- Hantavirus – rodent droppings
- Silica
- Mould

Polychlorinated Biphenyls (PCB)

Polychlorinated biphenyls (PCB) are regulated under both federal (Canadian Environmental Protection Act; PCB Regulations SOR/2008-273) and the BC Ministry of Environment Hazardous Waste Regulation and must be treated as PCB waste and be stored and disposed of accordingly. Energized fluorescent light fixtures were not disassembled to examine ballasts during this assessment.

Each fluorescent light fixture removed during renovation or demolition should have the ballast checked to determine if it contains PCB. Ballasts containing PCB must be removed, sorted and transported to a licensed facility. Although rare, paints have been known to contain PCBs.

Asbestos

Materials that contain at least 0.5% or more asbestos if tested in accordance with one of the following methods:

(a) (i) Asbestos, Chrysotile by XRD, Method 9000 (Issue 2, dated August 15, 1994) in the NIOSH Manual of Analytical Methods, published by the United States National Institute for Occupational Safety and Health, Centre for Disease Control;

(ii) Asbestos (bulk) by PLM, Method 9002 (Issue 2, dated August 15, 1994) in the NIOSH Manual of Analytical Methods, published by the United States National Institute for Occupational Safety and Health, Centre for Disease Control;

(iii) Test Method for the Determination of Asbestos in Bulk Building Materials (EPA/600/R-93/116, dated July 1993) published by the United States Environmental Protection Agency;

(b) vermiculite insulation that would be determined to contain **any** asbestos if tested in accordance with the Research Method for Sampling and Analysis of Fibrous Amphibole in Vermiculite Attic Insulation (EPA/600/R-04/004, dated January 2004) published by the United States Environmental Protection Agency;

The asbestos-containing material can also be characterized as friable and non-friable. Friable asbestos “means any material which, when dry, can be easily crumbled or powdered by hand

pressure, or a material that is crumbled or powdered" as defined under the BC Occupational Health and Safety Regulation. The condition of the asbestos and classifications would be used in assessing the level of action required with respect to re-use of the building.

Worker exposure to asbestos fibres is also regulated by the BC Occupational Health and Safety Regulation. The WorkSafeBC eight-hour time-weighted average (TWA) for asbestos fibres (all forms) is 0.1 fibre/cm^3. Exposure to these substances must be kept as close to zero as is reasonably practicable.

Bulk samples are collected in accordance with NIOSH Analytical Method 9002 and the WorkSafeBC guideline document, Safe Work Practices for Handling Asbestos.

Asbestos is designated as an ALARA substance; worker exposure to this product must be kept "as low as reasonably achievable" (ALARA). Employers are required under Section 5.54 (Exposure control plan) of the Occupational Health and Safety Regulation (OHSR) to develop an exposure control plan (ECP) when workers are or may be exposed to airborne concentrations of this material in excess of 50% of the exposure limit.

Mercury

Mercury is a hazardous substance, and any maintenance or abatement involving materials containing mercury or mercury compounds must be done in compliance with the BC Occupational Health and Safety Regulations (BCOHSR).

Employers with workers who have a risk of exposure must have an exposure control plan (ECP) in place prior to allowing their workers to come into contact with this material. As with all other hazardous substances, all personnel working around or with such materials must be made aware of their presence and be supplied with training in the potential health effects and means of avoiding exposures.

As a hazardous substance, transportation and disposal of this substance must be done in compliance with the federal Transportation of Dangerous Goods (TDG) Regulations and the BC Hazardous Waste Regulation. Mercury is found in fluorescent light bulbs, thermostats, manometers, and equipment such as electrical switches.

Mercury is designated as an ALARA substance; worker exposure to this product must be kept "as low as reasonably achievable" (ALARA). Employers are required under Section 5.54 (Exposure control plan) of the Occupational Health and Safety Regulation (OHSR) to develop an exposure control plan (ECP) when workers are or may be exposed to airborne concentrations of this material in excess of 50% of the exposure limit.

Ozone-depleting Substances (CFCs/ODS)

Chlorofluorocarbons (CFCs) are ozone-depleting substances (ODS) and a type of halocarbon. ODS are regulated by the Canadian *Environmental Protection Act* under the Ozone-Depleting Substances Regulations 1998 SOR/99-7 and the Federal Halocarbon Regulations (FHR) SOR/2003-289. Compounds that contain only chlorine, fluorine and carbon are called CFCs. These materials are used in refrigeration systems and in fire suppression systems. The other

main refrigerants are hydrochlorofluorocarbons (HCFCs), hydrofluorocarbons (HFCs) and blends of fluorocarbons (designated by "R").

While the regulations allow the continued use of halocarbon refrigerants, they strictly prohibit any person from releasing into the environment any halocarbon.

In the case of demolition, these materials will require proper recovery and disposal. The BC Ozone-Depleting Substances Regulations would also apply to any CFC/ODS abatement procedures. These regulations require that all ODS must be collected, stored and recycled, or collected and disposed appropriately by a licensed professional.

A good source for determining if the compound is ozone depleting is found at the following link: http://www.ec.gc.ca/Air/default.asp?lang=En&n=4CA440F8-1

Radioactive Materials

Many buildings contain smoke alarms which contain small sealed radioactive sources in the form of ^{241}Americium. The Canadian Nuclear Safety Commission (CNSC) and the Canadian *Nuclear Safety Act* regulate radioactive materials. These materials are sealed into a metal case within the smoke detector and must not be damaged or tampered with. Smoke detectors intended for disposal must be handled in accordance with CNSC regulations.

Ceramic tiles and some forms of granite sometimes contain radioactive materials. These materials should be checked prior to work being carried out on them to determine if radioactive materials are present.

Radon gas is a by-product of radioactive decay of certain naturally occurring radioactive materials. While Victoria has long been assumed to have low levels, a recent Health Canada nationwide study (March 2012) shows that in the Interior and east of the Coast Mountain Range, anywhere from 5 to 40 per cent of dwellings may have radon levels of more than 200 Bq/m3, depending on the community.

http://www.hc-sc.gc.ca/ewh-semt/pubs/radiation/survey-sondage/index-eng.php#a1

Radon levels vary widely not only from area to area, but even from house to house. A home is more likely to have high radon levels if:

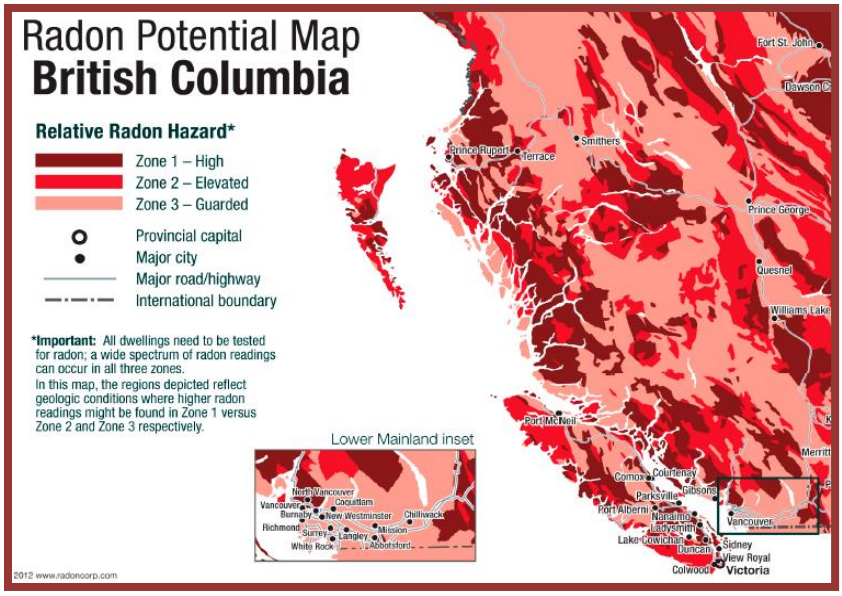
- It is built on dry porous soil.
- It has bare soil in the basement or crawlspace; or the building site was once a riverbed, a glacial outwash, or a slide area.
- There is high natural radioactivity in the area.

Newer dwellings that are tightly sealed tend to have higher radon levels. In homes with more than one floor, radon levels are often about twice as high in the basement as on the main floor.

The only way to establish the concentration of radon gas is to have it tested. The BC Centre for Disease Control (BCCDC) and Health Canada recommend that B.C. residents are encouraged to have their homes tested, especially those homes that are in the interior of the province.

New construction and renovations should meet requirements of the BC Building Code.

Figure 5-1: Radon Concentrations and Terrestrial Background Radiation in British Columbia



Radon Potential Map extract from Radon Corp (under copyright)

Aboveground / Underground Storage Tanks

Storage tanks containing fuels have the ability to leak over time and can result in soil and groundwater contamination. These tanks must be observed and checked over time to ensure they do not leak. Evidence of leaks must be investigated and any potential contamination remediated. The Canadian Council of Ministers of the Environment (CCME) publishes a Code of Practice for the safe management of aboveground and underground storage tanks.

Lead

Defined by the federal Ministry of Health, under the Hazardous Products Act, as a paint or other similar material that dries to a solid film that contains over 90 mg/kg (0.009%) dry weight of lead.

The Consumer Product Safety Act, Surface Coating Materials Regulation (SOR/2005-109) (SCMR) permits the advertising, sale and labeling of surface coatings (including paint) that meet the following criteria set out below. Quantities of lead and mercury are specifically limited. Other heavy metals are not addressed in this regulation.

Paints often contain heavy metals as pigments and/or preservatives. Under specific circumstances, persons may be exposed to these metals by ingestion, skin absorption and/or inhalation.

Most buildings built before 1950 have had lead-based paint applied to the interior or exterior surfaces, often up to 40% lead by weight. Paints made between 1950 and till present day usually contained smaller amounts of lead but can still pose risks to workers when disturbed.

There has been confusion in the past regarding the limits for lead and other heavy metals in paint and how that relates to worker safety and disposal. An explanation of the SCMR limits for paint and mercury are included in this report to help alleviate this confusion. Although a given

paint sample may have concentrations of lead and mercury lower than the limits specified within the SCMR, worker exposure may still occur if sufficient quantities of lead and/or mercury are inhaled, ingested or absorbed through the skin. The risk to workers posed by heavy metal containing coatings is proportional to the work undertaken. Heavy metal laden coatings that are not disturbed pose little risk to non-pre-school aged building occupants.

Other than during the application process, the primary mechanism of exposure for workers would be the inhalation of dusts through activities such as sanding, scraping, drilling, crushing, heating, burning or other processes likely to damage the coatings themselves. Paints containing heavy metals pose little risk to workers when in good condition and when undisturbed.

In 2005 the federal Surface Coating Materials Regulation was amended to reduce this threshold from 5,000 mg/kg to 600 mg/kg and then to 90 mg/kg in 2010. As paints under this concentration of lead are acceptable for use in residential settings today, such coatings do not pose a significant hazardous material issue unless rendered airborne within a worker's breathing zone by fine dust generating processes. Mercury is also limited to a level of 10 mg/kg. If a worker is, or may be, exposed to potentially harmful levels of lead, the employer must ensure that a risk assessment is conducted by a qualified person. Where a worker may be exposed to airborne lead concentrations in excess of 50% of the exposure limit of 0.05 mg/m^3 or where exposure through any route of entry could cause elevated blood levels, the employer must develop and implement an exposure control plan (ECP) which meets the requirements of section 5.54 of the BC Occupational Health and Safety Regulation. As an ALARA substance, worker exposure must be kept as low as reasonably achievable.

Table 5-1: ACGIH / WorkSafeBC Exposure Limits

Substance [CAS No.]	TWA
Lead - elemental and inorganic compounds, as Pb [7439-92-1]	0.05 mg/m3

Appropriate precautions for protecting workers from lead exposure should be implemented during any work involving lead or lead paint including the use of personal protective equipment, localized ventilation and/or dust suppression methods.

Toxicity Characteristic Leaching Procedure (TCLP) testing of positively identified lead paint applications is typically required to determine if the painted applications are classified as a hazardous waste as outlined in the Ministry of Environment's Hazardous Waste Regulation.

Note that lead residue on "cleaned" structural steel (from which lead-containing coatings have been removed) should not exceed 40 ug/sf prior to welding, cutting or burning.

Table 5-2: Recommended lead clearance criteria for surfaces

	Floor	Sill/ledge	Trough
Residences, schools, daycare centres, and other public buildings	0.43 mg/m^2 (40 µg/ft^2)	2.7 mg/m^2 (250 µg/ft^2)	4.3 mg/m^2 (400 µg/ft^2)
Commercial buildings, including retail stores, offices (administrative), and laboratories (other than lead assay laboratories)	2.2 mg/m^2 (200 µg/ft^2)	5.4 mg/m^2 (500 µg/ft^2)	8.6 mg/m^2 (800 µg/ft^2)

Reference: WorkSafeBC, Lead-Containing Paints and Coatings – Preventing Exposure in the Construction Industry, 2011

Hantavirus – Rodent Droppings

The Hantavirus is a virus associated with Hantavirus Pulmonary Syndrome, a disease caught through contact with the urine or droppings, or by being bitten or scratched by infected rodents. The disease starts off like a cold or flu (fever, sore muscles, headaches, nausea, vomiting), but progresses to pneumonia-like conditions within a few days. The change in intensity of the symptoms is very rapid and can result in fluid build-up in the lungs and respiratory failure.

Possible exposure to Hantavirus is regulated under the BC Occupational Health and Safety Regulation. Employers with workers who have a risk of exposure must have an exposure control plan (ECP) in place prior to allowing their workers to come into contact with this material. As with all other hazardous substances, all personnel working around or with such materials must be made aware of their presence and be supplied with training in the potential health effects and means of avoiding exposures.

Silica

Silica is a hazardous substance and as such is regulated under the BC Occupational Health and Safety Regulation. Airborne exposure criteria, respirator requirements and mandatory worker testing requirements are also outlined under this regulation. As with all other designated substances, all personnel working around or with such materials must be made aware of their presence and be supplied with training in the potential health effects and means of avoiding exposures.

Employers with workers who have a risk of exposure must have an exposure control plan (ECP) in place prior to allowing their workers to come into contact with this material. As with all other hazardous substances, all personnel working around or with such materials must be made aware of their presence and be supplied with training in the potential health effects and means of avoiding exposures.

Crystalline silica dust can cause a disabling, sometimes fatal disease called silicosis. The fine particles are deposited in the lungs, causing thickening and scarring of the lung tissue. The scar tissue restricts the lungs' ability to extract oxygen from the air. This damage is permanent, but symptoms of the disease may not appear for many years.

Employers have a duty to protect their workers from silica dust exposure on construction projects. Studies show that when common construction work tasks involving the sanding, drilling, chipping, grinding, cutting, sawing, sweeping, and blasting of concrete and concrete products are conducted without using dust controls, workers are exposed to airborne silica concentrations at levels far above the occupational exposure limits.

Crystalline silica is an ALARA substance; worker exposure to this product must be kept "as low as reasonably achievable" (ALARA). Employers are required under Section 5.54 (Exposure control plan) of the Occupational Health and Safety Regulation (OHSR) to develop an exposure control plan (ECP) when workers are or may be exposed to airborne concentrations of these materials in excess of 50% of the exposure limit.

Mould

Within the BC Occupational Health and Safety Regulations, there are no established permissible exposure levels for mould spores in air. This means that there are no published concentrations above which worker exposure is deemed to be hazardous and under which workers would not need respiratory protection. WorkSafeBC does, however, provide guidance on protocols for protecting workers from the hazards of airborne mould and bacteria within the section(s) of the Regulation guidelines addressing Indoor Air Quality.

Other guidelines for addressing mould in Canada include:

- The Canadian Construction Association document, "Mould Guidelines for the Canadian Construction Industry," CCA82-2004.
- The Institute of Inspection, Cleaning and Restoration and Certification (IICRC) standard S500 governing both water damage restoration and entitled: Standard for Professional Water Damage Restoration – S500. This document is approved by the American National Standards Institute (ANSI)
- Health Canada: Fungal contamination in public buildings: A guide to recognition and management, 1995
- Health Canada. Fungal Contamination in Public Buildings: Health Effects and Investigation Methods, 2004

These guidelines also state that any non-porous (metal, glass and hard plastics) and semi-porous (wood and concrete) materials that are structurally sound and visibly mouldy can be cleaned and re-used. However, porous materials such as ceiling tiles, wallpaper, insulation, drywall, and carpets with more than a small area of contamination, should be removed and discarded.

Flammables and Explosives

WorkSafeBC regulates Flammable and Combustible Substances and Substances Under Pressure according to the BC Occupational Health and Safety Regulations: Part 5 Chemical Agents and Biological Agents. Sections 5.27 to 5.47 include criteria for condition, handling and storage of these materials. Please contact NWest for detailed information regarding specific substances.

Appendix E. METHODOLOGY

As per WorkSafeBC requirements, the buildings/areas were assessed for the presence of several different types of hazardous materials. Sampling and analysis methodologies are detailed below.

If samples for hazardous contents are not indicated above, the Client may assume they were not collected and/or analysed.

Asbestos

The asbestos assessment methodology and sampling procedure are outlined in the following sections.

Assessment

This assessment was designed to determine the type and extent of asbestos containing material (ACM) presence within the subject site. The assessment is normally non-destructive, however, even with the most invasive assessment techniques the possibility remains for other concealed materials to be found during the demolition process.

Specific building material components were examined within the building and include, where applicable:

- Structural – all visible structural components including walls, roofs (invasive sampling may have been conducted) and supporting members,
- Mechanical systems – insulation, domestic hot and cold water, and caulks.
- Architectural systems including – texture coats, sheet flooring, vinyl floor tile, ceiling tile, wall board, drywall joint compound, sheet products.

Roofing core samples may have been collected with a roofing contractor on site to make good any damage made during sampling.

Bulk Sampling Procedures

Sampling procedures for various building materials vary somewhat depending on the exact conditions at each sample location. In all cases standardized protocols are used for collecting samples for asbestos analysis. All accessible suspect materials that were visually unique were sampled. Visually similar materials were only sampled once unless known to be heterogeneous such as drywall joint compound.

Where materials were observed that were suspected of containing asbestos, representative samples were collected. Where practicable, sample volumes were minimized to avoid unnecessary damage to building systems.

Sampled materials were cut down to the base substrate to ensure that a representative sample was collected. Samples were sent to an accredited laboratory and analysed following the EPA/600/R-93/116 method for analysis of asbestos in bulk materials by polarized light microscopy.

Lead

Paint Bulk Sampling Procedures

Painted surfaces were scraped to the base substrate to ensure that all layers of paint were included. Paint samples were tested using one or more of the following methods:

1. EMSL (SW-846-7420) Lead in Paint Chips by Flame Atomic Absorption Spectrophotometer,
2. EMSL (SW-846-6010) Inductively Coupled Plasma-Atomic Emission Spectrometry, and/or

3. EMSL (SW-846-1311/7420) Toxicity Characteristic Leaching Procedure.

Elemental Lead Assessment

The subject site was inspected for the presence of materials containing elemental lead. These materials were documented so that they can be removed prior to demolition activities. Samples were not collected.

Polychlorinated Biphenyls (PCB)

PCB-Containing Electrical Equipment

The subject site was visually assessed for the presence of polychlorinated biphenyls (PCBs) in electrical equipment such as fluorescent light ballasts. An in-depth review of each ballast is to be reserved for the deconstruction. Dismantling of in-service electrical equipment to observe individual ballasts was not feasible due to risk of electric shock and damage to the operating fixtures.

PCB-Containing Materials

Paints were not tested for PCB-content as testing was beyond the scope of this assessment.

Ozone Depleting Substances (CFCs/ODS)

The subject site was inspected for the presence of devices that are known or suspected of containing to contain Ozone Depleting Substances (ODS) or other halocarbons. Devices that contain ODS include refrigeration and air conditioning equipment. Devices suspected of containing these materials were documented so that the refrigerant gases may be removed prior to demolition or disposal of the equipment.

Labeling on the equipment will describe the type of refrigerant gases stored utilized within its compressor(s). In-use units were not opened to access labels.

Mercury-Containing Equipment

The subject site was inspected for the presence of mercury containing equipment. Devices suspected of containing mercury were documented so they can be removed prior to demolition. These devices typically include fluorescent light tubes, high efficiency light bulbs, thermostats, and manometers.

Radioactive Materials

Where observed, radioactive sources such as smoke detectors were noted by the NWest technicians. Testing for radioactive materials was outside the scope of this assessment.

Silica

Testing for crystalline silica in dust was not completed/conducted as part of this assessment however it is known to be a component of concrete, plaster, ceramic tile and stucco.

Observations were made on site to determine the presence of potential silica-containing materials.

Mould

Observations were made to identify the presence of mould and water damage within the subject site along with any obvious indoor air quality issues. Non-invasive or invasive investigation techniques were used, depending on the agreement with the Client.

Hantavirus – Evidence of Rodent Presence

Visual inspections were conducted for evidence of rodent presence including, droppings, nests, damage, carcasses, traps and tracks.

Flammable and/or Explosive Materials

Visual inspections were conducted for the presence of materials that may contain flammable and/or explosive contents. These typically include old drums, Jerry cans, cylinders with compressed contents and miscellaneous vessels. An assessment of the contents, if present, was beyond the scope of this project.

End of report.