

Hazardous Materials Survey

VIA Rail Building

Victoria, BC



Prepared by



North West
Environmental Group Ltd.
210-2950 Douglas St
Victoria, British Columbia

Prepared for:
MMM Group

*Suite 600 - 1455 West Georgia Street,
Victoria, BC
V6G 2T3*

NWEG Project: 17958

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EXECUTIVE SUMMARY

North West Environmental Group conducted a hazardous materials risk assessment at VIA Rail Building at the Johnson Street Bridge, Victoria, BC on July 9, 2012. 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 is an older single-storey brick building with wood beams and a concrete foundation.

The building was not occupied during the survey and, therefore, invasive investigative techniques were used. Even with the most invasive survey techniques, however, it should be noted that the possibility remains for other concealed materials to be found during the demolition process.

WorkSafeBC Regulations require that all hazardous materials found to be in the way of the planned work, including asbestos, be removed prior to demolition or protected from damage prior to the commencement of construction and/or renovation work. Disturbance or removal of hazardous materials must be undertaken 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 demolition work. This report includes a list of building materials that are confirmed or suspected of containing hazardous materials.

The survey identified the following hazardous materials:

Hazardous Material	Type and Location
Asbestos	→ No asbestos-containing materials were identified
PCBs	→ Fluorescent Light Ballasts present
Mercury	→ Fluorescent Light Tubes
Lead	→ Lead based or lead containing paint assumed to be in all original coatings on and in the building
Silica	→ Assumed to be present in concrete, plaster and stucco

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

***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.

1 INTRODUCTION

North West Environmental was retained by Didier Samoihan of MMM Group to conduct a hazardous-material risk assessment at the VIA Rail Building on the East side of the Johnson Street Bridge as per WorkSafeBC requirements. This is a project-specific risk assessment intended to identify building materials and equipment containing hazardous materials that may be impacted by the demolition work planned for the building. The building is an older single-storey brick building with wood beams and a concrete foundation.

All accessible areas of this building within the survey area were inspected for the presence of asbestos-containing materials, mould, lead, radioactive sources, ozone depleting substances, mercury, and PCBs. Where appropriate, representative samples of materials suspected of containing asbestos or other hazardous materials were collected and sent for confirmatory testing.

Observations were made to determine the presence of equipment including mercury-containing thermostats, smoke detectors, refrigerating devices, urea-formaldehyde foam insulation, as well as aboveground storage tanks that may be impacted by the work.

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 REGULATORY CRITERIA

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

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

2.1 Polychlorinated Biphenyls (PCB)

Polychlorinated biphenyls (PCB) are regulated under both federal (Canadian Environmental Protection Act) and BC 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.

2.2 Asbestos

Projects that will result in the disturbance of asbestos-containing materials (ACMs) must satisfy WorkSafeBC's regulations and conform to the guidance document Safe Work Practices for Handling of Asbestos. WorkSafeBC's Occupational Health and Safety Regulation defines an asbestos-containing material as "any manufactured article or other material, other than vermiculite insulation, that would be determined to 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/cm³. 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 materials in excess of 50% of the exposure limit.

2.3 Mercury

Mercury is 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 materials in excess of 50% of the exposure limit.

2.4 Arsenic

Arsenic is hazardous substance, and any maintenance or abatement involving materials containing arsenic or arsenic 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.

Arsenic has long been used as a pesticide due to its toxic properties. Arsenical pesticides, often in the form of chromated copper arsenate (CCA), when applied with high pressure to wood, serve to extend the structural life of the material by making it resistant to mould, rot and insect infestation. Studies have shown that these materials have the ability to leach arsenic into the soil. Arsenic may also be found in paints. Although wood and wood dusts contaminated with arsenical pesticides do not require specialized disposal in BC, care must be exercised to minimize the

potential for worker exposure to these materials through direct skin contact or through inhalation of dusts and fumes.

2.5 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/99-225. 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.

2.6 Urea Formaldehyde Foam Insulation

Urea Formaldehyde Foam Insulation (UFFI) was banned in 1978. All such material was to have been removed and replaced. Standard real estate agreements currently contain a "No UFFI" clause and as a best management practice, all buildings containing UFFI should have the material removed. UFFI is still found in many buildings in BC.

2.7 Radioactive Materials

Many buildings contain smoke alarms which contain small sealed radioactive sources in the form of ²⁴¹Americium. 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. The following map from <http://www.bccdc.ca/healthenv/Contaminants/Radon/default.htm> shows areas of BC where this has been found:



Figure 1: Main Floor Radon Concentrations and Terrestrial Background Radiation in British Columbia Communities

2.8 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.

2.9 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 lead paint of this era contained up to 40% lead by weight. Paints made between 1950 and 1978 usually contained smaller amounts of lead. Paints often contain other heavy metals including mercury, arsenic and chromium.

There has been confusion in the past regarding the limits for lead and mercury 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/cu.m 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 1: ACGIH / WorkSafeBC Exposure Limits

Substance [CAS No.]	TWA
Lead - elemental and inorganic compounds, as Pb [7439-92-1]	0.05 mg/m ³

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.

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 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

2.10 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.

2.11 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 this materials in excess of 50% of the exposure limit.

2.12 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 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.

3 FINDINGS

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

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

Photographs of materials are in Appendix 1.

Copies of the analytical reports are provided in Appendix 2.

Sample location drawings are in Appendix 3.

3.1 Polychlorinated Biphenyls (PCB)

Fluorescent light fixtures were observed in the building during the survey. Prior to demolition, any fluorescent light fixtures should be checked to ensure that ballasts do not contain PCB's. If PCB's are found to be present, the ballasts should be removed and disposed in accordance section 2.1 of this report.

Paints were not tested for PCB content.

3.2 Asbestos

3.2.1 Bulk Samples

All accessible areas of the building that could be disturbed by planned work were inspected for the presence of building materials suspected of containing asbestos and sampled where appropriate and analysed for the presence of asbestos fibres.

The VIA Rail building had an open ceiling with no wall cavities, therefore vermiculite insulation was not observed.

Bulk samples of building materials suspected of containing asbestos were collected from a number of areas in the building in accordance with WorkSafeBC requirements and analyzed to determine the type and approximate content of asbestos.

No asbestos-containing materials were identified in this survey.

3.3 Mercury

Mercury-containing thermostats were not observed within the building.

Mercury containing thermostats should be removed prior to demolition and be packaged for transport and storage or disposal/destruction at a licensed facility. Alternatively, if functional, these units could be re-used for their original intended purpose.

Mercury is also found in fluorescent light tubes. Caution should be exercised to ensure light tubes are not broken, releasing droplets of mercury.

3.4 Arsenic

Wood likely to have been preserved with arsenical pesticides was not observed on the subject site.

Caution must be taken to ensure this material is not burned or composted if removed during renovation or demolition.

3.5 Ozone-depleting Substances (CFCs/ODS)

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

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 accordingly.

3.6 Urea Formaldehyde Foam Insulation

No sampling was undertaken for Urea Formaldehyde Foam Insulation (UFFI) as materials suspected of containing UFFI were not observed in the building.

3.7 Radioactive Materials

Smoke detectors containing sealed ²⁴¹Americium sources were not observed in the building. Smoke detectors that may be removed during the planned work should be collected and disposed in accordance with Canadian Nuclear Safety Commission regulations.

3.8 Aboveground Storage Tanks

No aboveground tanks were observed near the areas of the site where the planned work will be undertaken. The conducting of a Stage 1 Preliminary Site Investigation was beyond the scope of this report.

3.9 Lead

3.9.1 Lead Paint

Painted surfaces such as window frames and original wood exterior coatings are suspected to contain lead. Lead based, or containing paints were commonly used during the era of construction for these buildings and all original surface coatings should be considered to be lead.

3.9.2 Elemental Lead

No sources of elemental lead were observed in the way of planned work. If lead materials are found they are typically recognized as having significant salvage value, disposal therefore should not be a major concern. Workers should exercise caution if heat is to be used to melt any lead found as means of facilitating its extraction. Molten lead can produce significant quantities of inhalable lead fume which can pose a severe health hazard. The BC Occupational Health and Safety Regulation requires that worker exposure to airborne lead be kept below 0.05 mg/m³.

Lead within the copper water pipes/fittings was not tested for lead content however lead content in solder, especially from buildings of this vintage, is known to reach levels up to 98% lead.

3.10 Hantavirus – Rodent Droppings

Rodent droppings were not observed in the way of planned work. If rodent droppings are encountered during demolition, then the Contractor should develop and follow a worker hantavirus program. The contractor must provide worker instruction on the hazards of rodent

droppings and other biohazardous materials, including the types of respirators and protective clothing to be worn.

3.11 Silica

All concrete, plaster and stucco is suspected of containing silica in crystalline and non-crystalline forms. Many of the removal techniques (grinding, cutting, chipping etc) for these materials can generate high levels of crystalline silica in the air. Use wetting techniques and/or HEPA equipped extraction systems attached to drills and other power equipment where possible in order to decrease dust levels.

3.12 Mould

Mould was not observed within the building. If mould is encountered during demolition, work should stop and a risk assessment per WorkSafeBC Guidelines G4.79 (Moulds and indoor air quality) be conducted.

Table 3 Guide for Removing Visible Mould Growth in the Indoor Environment

Extent of Visible and Hidden Mould Growth (surface area)	Minimum Recommended PPE ¹	Control Measures to Prevent Dust or Spore Dispersion ²
<p>Small Total surface area affected is less than 1 square metre (10 square feet)</p>	<p>N95 respirator or half face piece respirator with HEPA filters, gloves, and goggles.</p>	<p>Isolation of the work area; wet wiping or misting of surfaces with water containing a surfactant (wetting agent); and the use of drop sheets to prevent dispersion of dust and spores. Material is removed with minimum of dust and spore dispersal and placed in a plastic bag and sealed.</p>
<p>Medium Total surface area affected is between 1 square metre and 10 square metres (10 square feet to 100 square feet)</p>	<p>N95 respirator or half face piece respirator with HEPA filters, gloves, disposable coveralls, and goggles.</p>	<p>Limited containment: use polyethylene sheeting ceiling to floor around the affected area with a slit entry and covering flap. Maintain area under negative pressure with HEPA filtered negative air unit. Block supply and return air vents within the containment area.</p>
<p>Large Total surface area is greater than 10 square metres (100 square feet) or the potential for increased occupant or remediator exposure during remediation is estimated to be significant.</p>	<p>Full face piece or powered air purifying respirator (PAPR) with HEPA filters, gloves, disposable coveralls (covering head and boots), and goggles.</p>	<p>Full containment: use of critical barriers. Maintain area under negative pressure with HEPA filtered fan unit exhausted outside the building. Block supply and return air vents within the containment area. Provide facilities and procedures for decontamination and personal hygiene.</p>

4 RECOMMENDATIONS

Based on the findings, the recommendations are:

1. Provide copies of this report to site personnel, including contractors. A copy of the survey must be immediately available at the site whenever workers are present.
2. The contractor shall have an exposure control plan in place for each hazardous substance identified in this report as being in way of the planned work.
3. Work must STOP if additional suspect materials are encountered during renovations and/or demolition activities. These suspect materials must be left undisturbed until testing determines the presence or absence of asbestos or other hazardous materials. In addition, work must also STOP in the event these suspect materials are disturbed inadvertently.
4. **Polychlorinated biphenyls:** Equipment suspected of containing polychlorinated biphenyls such as fluorescent light fixtures was observed. Each unit removed should have the ballast checked to determine if it contains PCB. Ballasts containing PCB must be removed, sorted and transported to a licensed facility.
5. **Mercury:** Mercury containing equipment such as fluorescent light tubes were observed. If in way of planned work, such items should be removed prior to be packaged for transport and storage or disposal/destruction at a licensed facility. Alternatively, the equipment, if functional, could be re-used for its original intended purpose.
6. **Arsenic:** Wood likely to have been preserved with arsenical pesticides was not observed. Although wood and wood dusts contaminated with arsenical pesticides do not require specialized disposal in BC, care must be exercised to minimize the potential for worker exposure to these materials through direct skin contact or through inhalation of dusts and fumes. Caution must be taken to ensure this material is not burned or composted if removed during renovation or demolition.
7. **Ozone Depleting Substances (ODS):** Equipment suspected of containing ODS was not observed. If encountered, however, each unit removed should be inspected. If ODS are present, they will require proper recovery and disposal. The BC Ozone-Depleting Substances Regulations apply to any CFC/ODS abatement procedures. These regulations require that all ODS must be collected, stored and recycled, or collected and disposed by a qualified technician.
8. **Urea Formaldehyde Foam Insulation:** no UFFI was observed.
9. **Radioactive Materials:** Equipment containing radioactive substances (including smoke detectors) were not observed. If encountered during renovations these items should be collected and disposed in accordance with Canadian Nuclear Safety Commission regulations. Radon gas was not tested for as Victoria is not considered at significant risk for radon gas build up.
10. **Aboveground Storage Tanks (AST):** No aboveground tanks were observed adjacent to the subject building.
11. **Lead:** All paint should be presumed to contain lead based upon the age and usage of the building. No other potential sources of lead were observed. Ensure work impacting the paint coatings proceeds in a manner that will contain any paint dust and in full compliance with WorkSafeBC regulations and that any wastes are collected, tested, and if deemed hazardous, disposed at a licensed facility.
12. **Hantavirus:** no visual evidence or rodent presence was observed. Ensure any rodent droppings or nest encountered are cleaned up and in full compliance with WorkSafeBC regulations.
13. **Silica (crystalline):** Workers should use caution to avoid creating airborne silica dust while removing concrete and stucco. Use wetting techniques and/or HEPA equipped extraction

systems attached to drills and other power equipment where possible in order to decrease dust levels.

14. **Mould:** Mould was not observed in the building. If encountered it must be removed in compliance with WorkSafeBC guideline to the Regulation Section 4.79.
15. If any of the hazardous materials described in Section 2 are encountered and not referred to in these Recommendations, refer to the corresponding material(s) in Section 3 for a description on the safe handling or management of those materials.

5 CLOSURE

This survey and assessment report has been prepared exclusively for the client. It is a statement of the presence and condition of asbestos-containing materials and other hazardous materials as outlined in the report and as observed on the date this survey was conducted. 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, 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. A stage 1 Preliminary Site Investigation was not part of our scope of work.

Because of the limitations stated above, the findings, observations and conclusions expressed by North West 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 investigation.

This report may not be used, relied upon, copied, published, or quoted by any party without the written consent of North West Environmental Group, Ltd. 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.



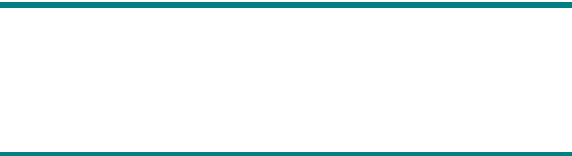


Jason Smit, B.Sc., CIH, CRSP
Senior Occupational Hygienist



Kris White, B.Sc.
Occupational Hygiene Technologist

APPENDIX 1 Photographs

	
<p>Sample: 17958-01 Unit/Location: Women's Washroom Description: Mastic – Ceramic Tile Asbestos: None Detected</p>	<p>Sample: 17958-02 Unit/Location: Janitor's Closet Description: Drywall Joint Compound Asbestos: None Detected</p>
	
<p>Sample: 17958-03 Unit/Location: Electrical Panel Description: Drywall Joint Compound Asbestos: None Detected</p>	

APPENDIX 2 Sample Report



Unit 210 - 2950 Douglas Street
Victoria, B.C. V8T 4N4

Tel: 250-384-9695
Fax: 250-384-9865
e-mail: northwest@nwest.bc.ca

Bulk Sample Report

Asbestos Analysis of Bulk Materials using Polarized Light Microscopy

Client: MMM Group
Contractor: MMM Group
Project: VIA Rail Building - Johnson Street Bridge Hazmat

Date: July 12, 2012
Client Job or PO#:
Project number: 17958

Sample No	Location	Date Analysed	Analyst	Description	Phase	%	Asbestos	%	Other Materials	%
17958-1	Women's Washroom	Jul-12-2012	SD	Mastic - Under Ceramic Tile	Light brown massive	100	None Detected	0	Non-Fibrous	100
17958-2	Janitor's Closet	Jul-12-2012	SD	Drywall Joint Compound - White Cement	Layer between paint and cornerbead	100	None Detected	0	Non-Fibrous	100
17958-3	Electrical Panel	Jul-12-2012	SD	Drywall Joint Compound - White Cement	Layer between paint and corner bead	100	None Detected	0	Non-Fibrous	100

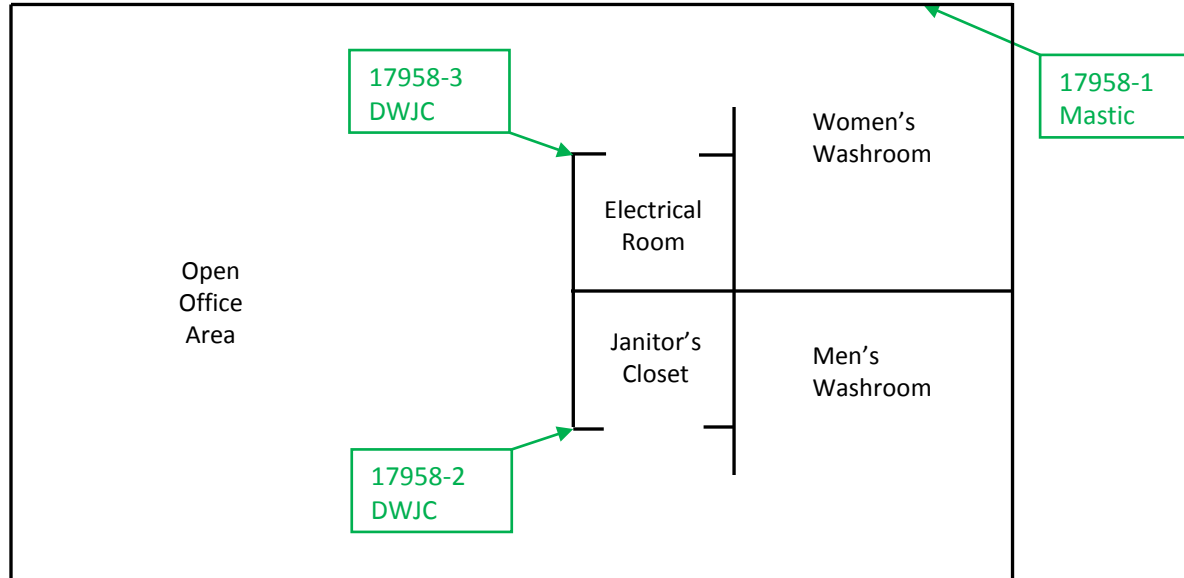
Note: Samples were analyzed by method: EPA/600/R-93/116" Bulk Asbestos Analysis by Polarized Light Microscopy". For heterogenous materials the concentration may vary. No reproduction without permission.



APPENDIX 3 Sample Locations - Drawings

LEGEND

DWJC = Drywall Joint Compound



DRAWING NOT TO SCALE

LEGEND

ASBESTOS

123

None Detected

123

Material Contains Asbestos

ADDRESS/LOCATION:

VIA Rail Building – Johnson Street Bridge

DRAWING TITLE:

Main Floor

PROJECT NO.: **17958**

DATE: July 16, 2012

SURVEYED BY: KW

DRAWING NO.: 001



North West
Environmental Group Ltd.

#210 – 2950 Douglas St.

Victoria, BC V8T 4N4