CITY OF VANCOUVER

CITY CLERK'S DEPARTMENT
Access to Information & Privacy Division

File No.: 04-1000-20-2021-519

December 7, 2021

s.22(1)

Dear s.22(1)

Re: **Request for Access to Records under the Freedom of Information and Protection of Privacy Act (the "Act")**

I am responding to your request of October 5, 2021 for:

> **Hazmat survey submitted as part of Building Permit Application DB-2020-03962 issued on May 25, 2021 for voluntary seismic/life safety/accessibility upgrades for David Livingston School at 315 East 2nd Avenue. (The building permit application was made December 11, 2020, and issued May 25, 2021.)**

All responsive records are attached.

Under section 52 of the Act, and within 30 business days of receipt of this letter, you may ask the Information & Privacy Commissioner to review any matter related to the City's response to your FOI request by writing to: Office of the Information & Privacy Commissioner, info@oipc.bc.ca or by phoning 250-387-5629.

If you request a review, please provide the Commissioner's office with: 1) the request number (#04-1000-20-2021-519); 2) a copy of this letter; 3) a copy of your original request; and 4) detailed reasons why you are seeking the review.

Yours truly,

[Signature on file]

Barbara J. Van Fraassen, BA
Director, Access to Information & Privacy
Barbara.vanfraassen@vancouver.ca
453 W. 12th Avenue Vancouver BC V5Y 1V4

*If you have any questions, please email us at foi@vancouver.ca and we will respond to you as soon as possible. Or you can call the FOI Case Manager at 604.871.6584.

Encl.

:kt

HAZARDOUS MATERIALS SURVEY

OF

DB-2020-03962

Sir David Livingstone Elementary School
Vancouver, BC

PREPARED FOR:

Vancouver School Board
Planning & Facilities
1580 West Broadway
Vancouver, BC
V6J 5K8

PREPARED BY:

ACM ENVIRONMENTAL CORPORATION
#217 - 2323 Quebec Street
Vancouver, BC
V5T 4S7
604-873-8599

December 20, 2018

EXECUTIVE SUMMARY

A.C.M. Environmental Corporation (ACM) was retained by Vancouver School Board (VSB) to provide a Hazardous Materials Survey for Sir David Livingstone Elementary School located at 315 East 23rd Avenue in Vancouver, BC.

Objective:

The survey was conducted as part of a project definition study for the school, for seismic upgrade purposes. The objective of this survey was to identify the types, condition and extent of hazardous materials in the school that may be impacted during any renovation activities associated with the seismic upgrade activities.

Background:

The school currently consists of a two storey building with basement, built in two phases, and a Daycare outbuilding and portable. The school is made primarily of concrete construction, with some cinderblock, clay tile and brick. Interior finishes consist primarily of plaster, exposed concrete and cinderblock, with limited drywall.

Method:

The survey was conducted using both visual and physical assessment techniques, in accordance with WorkSafeBC OH&S Regulation 20.112. Representative samples of materials suspected of containing asbestos and/or lead were collected and were submitted to laboratories for analysis. The surveyed areas were also inspected for possible PCB containing fluorescent light ballasts, mercury containing switches, and other potentially hazardous materials (e.g. mould, potential CFC's, etc.) during the survey.

A review of the existing asbestos sample results for the school (obtained from VSB Maintenance) was conducted prior to attending the school, and the information available from these results is incorporated into this report.

Limitations:

The school is currently fully operational, and therefore, destructive testing was not possible. Areas within walls and above fixed ceilings were only inspected where access was possible (e.g. through existing hatches or damaged areas). Block walls were drilled and inspected for possible vermiculite block insulation.

Assumptions made pertaining to the hazardous materials existing in any inaccessible areas (i.e. concealed hazardous materials) are noted in this report.

Results:

Table 1 below summarizes the hazardous materials identified within the school. All hazardous materials in their current states do not pose a risk to occupants or workers in the school as long as the materials remain undisturbed.

Table 1: Hazardous Materials within the School

Hazard	Material / Component	Approximate Quantity
Asbestos	Drywall Taping Compound	5,000 ft²
	Concrete Coating	2500 ft²
	Wall Fill Material	1 ft²
	Vinyl Floor Tiles	6,000 ft²
	Window Glazing Mastic/Putty	800 units
	Duct Mastic	25 ft
	Cove Base Adhesive	1000 ft
	Exterior Textured Plaster/Mastic	13,500 ft²
	Fire Door Core Insulation	6 units
	Gaskets and Packings	150 units
Lead	Paints	120,000 ft²
	Ceramic Tiles	2,000 ft²
	Plumbing Vent Pipes	50 ft
Polychlorinated Biphenyls (PCBs)	Fluorescent Light Ballasts	500 units
Mercury	Fluorescent Light Tubes	1,000 tubes
Chlorofluorocarbons (CFCs)	Refrigerants	6 Refrigerators / AHU's
Silica	Concrete Foundations and Walls	N/A

Recommendations:

Risk assessments and safe work procedures are required prior to disturbing any of the identified hazardous materials. For asbestos and lead containing materials, a Notice of Project (NOP) must also be submitted to WorkSafeBC a minimum of 48 hours prior to impacting said materials. All work impacting the hazardous materials must only be conducted by trained personnel, under a company Exposure Control Plan (ECP) for the specific hazardous materials being impacted.

If any suspect asbestos or lead containing materials are encountered within walls, above ceilings, or under floors during demolition activities, the work in the immediate area must stop and the materials must be inspected by a qualified person as per WorkSafeBC OH&S Regulation 20.112.

Please review Section 3 – Results and Discussion, and Section 4 – Recommendations, for more detailed information.

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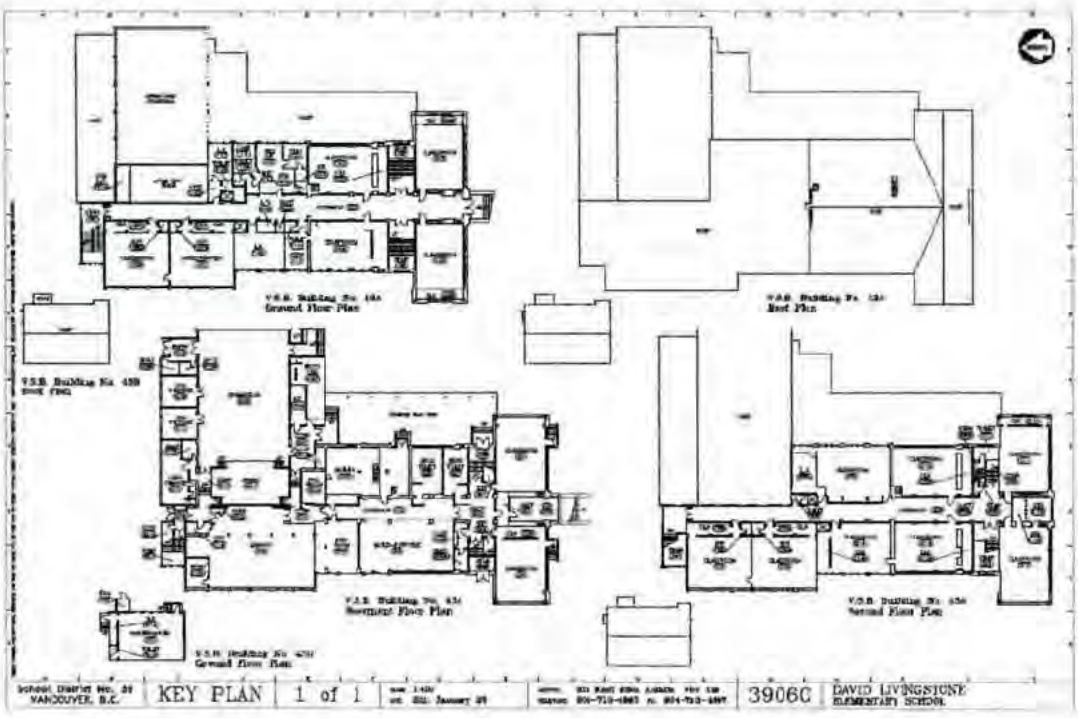
1.0 INTRODUCTION

A.C.M. Environmental Corporation (ACM) was retained by Vancouver School Board (VSB) to provide a Hazardous Materials Survey for Sir David Livingstone Elementary School located at 315 East 23rd Avenue in Vancouver, BC.

The survey was conducted as part of a project definition study for the school, for seismic upgrade purposes. The objective of this survey was to identify the types, condition and extent of hazardous materials in the school that may be impacted during any renovation activities associated with the seismic upgrade activities.

The school currently consists of a two storey building with basement, built in two phases, and a Daycare outbuilding and portable. The school is made primarily of concrete construction, with some cinderblock, clay tile and brick. Interior finishes consist primarily of plaster, exposed concrete and cinderblock, with limited drywall. Figure 1 shows the key plan for Sir David Livingstone Elementary School.

Figure 1: Building Key Plan



Site inspections for the school were conducted on November 9, 16 and 26, 2018 by Brian Saarela, CEI, ABI, CLRA, Senior Project Manager for ACM, and by Jim Williams, Dipl.Tech, ABI, Senior Project Manager for ACM, Tony Lai, B.Tech, EnvTech, Dipl.T OHS, ABI, WRT, Environmental Technologist for ACM, Callum Armour, B.A., ABI, and Anna Nijhof, Environmental Technicians for ACM. Photographs taken during the survey are included in Appendix E.

A total of 90 representative bulk samples of materials suspected of containing asbestos were collected by ACM during the survey and are included in Appendix A of this report. Previous asbestos bulk sample results from VSB Maintenance is included in Appendix B.

Twenty Four (24) representative paint/coating samples were collected from the school and were submitted to Maxxam Analytics in Burnaby, BC for lead analysis. Two representative samples of lead painted materials likely to be landfilled were collected and analyzed for lead leachability. The samples were collected from materials with the highest recorded lead levels. Lead sample results are included in Appendix C of this report.

2.0 METHODOLOGY

The hazardous materials survey was conducted using minor destructive testing methods due to the school being fully operational. Areas within walls and above fixed ceilings were inspected where access was possible. **It must be noted that there is a possibility of asbestos and/or lead containing materials existing within wall and ceiling cavities, and under sub-floors, as not all areas were accessed during the inspections. Possible asbestos-containing materials which may exist in these areas may include, but are not limited to, insulation materials (mechanical or construction, including vermiculite insulation within cinderblock walls), secondary layers of drywall or flooring, etc. Possible lead-containing materials which may exist in these areas may include, but are not limited to, paint, electrical wire casings, cast iron piping spigots, etc.**

The U.S. Environmental Protection Agency (USEPA) Guidance Document for Controlling Asbestos-Containing Materials in Buildings, was selected for use in this study. The document identifies factors associated with the "condition" and "potential for disturbance or erosion" of asbestos containing materials. These factors help to define the fibre release potential of suspect asbestos containing materials and were used in a qualitative evaluation of materials found in the surveyed areas. Recommendations have been substantiated by additional information utilized from other documentation cited in the Reference Section of this report.

Samples of materials suspected of containing asbestos were collected and analyzed in ACM's laboratory in accordance with the WorkSafeBC Occupational Health and Safety Regulations and Guidelines (G20.112) and National Institute of Occupational Health and Safety (NIOSH) analytical methods.

The OSHA 29 CFR 1926.62 Lead Standard, and the WorkSafeBC publication "Safe Work Practices for Handling Lead" were selected for use in this study. This standard applies to any work involving demolition, removal, encapsulation, renovation, installation, alteration, maintenance, transportation, storage, or disposal of Lead Containing Materials (LCMs).

Samples of paints and coatings, suspected of containing lead, were sent to Maxxam Analytics for analysis of lead content. The samples were digested with acids and analyzed using Inductively Coupled Plasma Spectroscopy–Atomic Emission Spectroscopy.

Toxicity Characteristic Leaching Procedure – the samples were leached using procedures described in the U.S. E.P.A. "Code of Federal Regulations" Special Edition of the Federal Register, pages 783-797.

Metals in TCLP Leachate - analysis was performed using Plasma Spectroscopy (ICP), or by specific techniques described in the attached laboratory results.

Sample location diagrams are located in Appendix D of this report.

3.0 RESULTS & DISCUSSION

Each type of hazardous material observed within the building is described in this section.

The school is currently fully operational, and therefore, destructive testing was not possible. Areas within walls and above fixed ceilings were only inspected where access was possible (e.g. through existing hatches or damaged areas). Assumptions made pertaining to the hazardous materials existing in these inaccessible areas (i.e. concealed hazardous materials) are noted.

3.1 ASBESTOS

Table 2 summarizes the asbestos containing materials observed or assumed to exist within the school.

It must be noted that the quantities listed in Table 2 (following page) are only approximate and estimated amounts. These quantities should not be relied upon for bidding purposes by any contractor during any related project tender.

All asbestos containing materials observed during the survey were found to be in good condition, and in their current states, do not pose a risk to occupants of the building as long as the materials remain undisturbed. Prior to any activities taking place which could disturb the asbestos containing materials, the materials must first be removed and disposed of in accordance with applicable regulations and procedures.

Select strategic locations of cinderblock materials were also drilled to inspect for possible vermiculite insulation. However, the materials were not found during the survey in any of the drilling locations.

Table 2: Asbestos Containing Materials in the School

Building Material	Location(s)	Quantity
Drywall Taping Compound	• All drywall existing in the school	5,000 ft²
Concrete Wall Coating	• All concrete coating materials on all walls and chimney within the boiler room of the building	2500 ft²
Wall Fill Material	• One square hole in west wall of Fan Room 024	1 ft²
Vinyl Floor Tiles	• Basement Corridors 011, 015, 023, & Main Floor Corridor 100 (north end) • Library 012 & workroom 012A (under carpet), Rooms 016A, 017, 018, 019, 019A, 019B, 013A, 014, Stair Landing 197, 101B (Daycare "B" Building).	6,000 ft²
Window Glazing Mastic/Putty	• All windows within the school, including windows on doors	800 glazing units
Duct Mastic	• All original silver/gold duct mastic found within the school	25 ft
Cove Base Adhesive	• All cove base materials throughout north basement of the school	1000 ft
Exterior Textured Plaster/Mastic	• On all Exterior walls of the original South section of the building (Peaked roof)	13,500 ft²
Fire Door Core Insulation (Assumed)	• All fire doors within the school	30 units
Gaskets and Packings (Assumed)	• All bells and spigots of cast iron drain pipes	150 units

3.1.1 Drywall Taping Compound

Very limited amounts of drywall were of observed during the survey. Of all the drywall materials observed, representative sampling of the materials was conducted. Asbestos containing drywall taping compounds (1-5% Chrysotile asbestos) were found in various areas of the school. The locations of the asbestos containing drywall taping compounds do not indicate any pattern that would allow the materials to be distinguished from the non-asbestos containing drywall materials found within the school.

Therefore, all drywall materials found within the school are considered asbestos containing.

3.1.2 Concrete Wall Coating

A concrete skim coat was observed on the interior perimeter walls and chimney within the boiler room of the building. Two samples of the concrete coating were collected during this survey and both were found to contain 1-5% Chrysotile asbestos.

All concrete skim coat materials throughout the boiler room of the building must be treated as asbestos containing.

3.1.3 Wall Fill Material

A square opening in the west wall of Fan Room 024 was observed to be filled with a soft brown cementitious material. One sample of the material was collected during this survey and found to contain 1-5% Chrysotile asbestos.

Although no further materials of this type were observed in the building, there is a possibility more of the same materials may exist in concealed areas. Any soft brown cementitious wall fill materials encountered within the building must be treated as asbestos containing.

3.1.4 Vinyl Floor Tiles

Various vinyl floor tiles were observed to exist within the buildings surveyed. A sample of each pattern/type of vinyl floor tile observed was collected. All 9" vinyl floor tiles within the building and the 12" cream vinyl floor tiles within Storage Room 014 were found to be asbestos containing. No asbestos was detected in any of the underlying mastic adhesive materials. Based on the sampling, asbestos containing vinyl floor tiles (1-5% Chrysotile asbestos) were identified in the following areas:

Basement Corridors 011, 015, 023, & Main Floor Corridor 100 (north end)

Library 012 & workroom 012A (under carpet), Rooms 016A, 017, 018, 019, 019A, 019B, 013A, 014, Stair Landing 197, 101B (Daycare "B" Building).

3.1.5 Window Glazing Mastics/Putty

Various window glazing mastics, as well as glazing putties were observed during the survey throughout the school. Several representative samples of these materials were collected and some were found to be asbestos containing (1-5%

Chrysotile asbestos). VSB records also indicate the presence of asbestos containing window putties.

The results do not indicate any particular pattern to the materials' application within the areas inspected. **Therefore, all interior and exterior windows existing within the school are considered to have asbestos containing window glazing mastics/putties. This includes those found on door windows.**

3.1.6 Duct Mastic

Almost all duct mastic materials throughout the building were observed to be a newer non-asbestos containing grey or white material. However, some original Asbestos containing silver/gold duct mastic materials (1-5% Chrysotile asbestos) were observed in Fan Room 024 (residual mastic left on concrete walls) as well as in Fan Room 010 (one square duct riser beside entrance door. No other asbestos containing duct mastics were observed on any other visible ducting during the survey.

All silver and/or gold duct mastic found within the school is considered asbestos containing.

3.1.7 Cove Base Adhesive

A small patch of black mastic cove base adhesive was observed to be applied over top of the brown non-asbestos containing adhesive within Storage Room 013A. The cove base application is typical throughout the north end basement areas of the building (on concrete/block walls). A sample of the black cove base adhesive was collected and found to contain 1-5% Chrysotile asbestos.

As the extent of the black cove base adhesive materials cannot be accurately determined, all cove base adhesive materials within the basement level of the building must be treated as asbestos containing.

3.1.8 Exterior Textured Plaster / Mastic

The exterior of the south section of the building (peaked roof section), was observed to have a textured finish under the exterior paints. Two samples of the exterior textured plaster / mastic were collected and both were found to contain 1-5% Chrysotile asbestos in a layer of black mastic in the material.

As the extent of the black cove base adhesive materials cannot be accurately determined, all cove base adhesive materials within the basement level of the building must be treated as asbestos containing.

3.1.9 Fire Door Core Insulation

All metal fire doors within the building are assumed to have asbestos containing core insulation materials concealed within the doors (Typically 40-75% Chrysotile asbestos). **All metal fire doors within the building must be treated as asbestos containing.**

3.1.10 Gaskets and Packings

Asbestos containing rope/packings are assumed to exist within the bells and spigots of the cast iron rain drain pipes throughout the school.

Asbestos gaskets are also assumed to exist within all bolted pipe flanges on any heating pipes throughout the school.

3.2 LEAD CONTAINING MATERIALS

The lead containing materials existing within the school consist of paints/coatings, and lead containing products, such as ceramic tiles and vent pipes. All lead containing materials were found to be in generally good condition, with only some areas showing signs of deterioration (e.g. flaking paints on some walls and ceilings, etc.).

3.2.1 Paints/Coatings

Twenty Four (24) samples of paint/coatings were collected from the buildings inspected and analyzed for lead content. The lead concentrations within the samples collected were found to range from <6.0 milligrams/kilogram (mg/kg) to 29600 mg/kg. The locations and sample results are located in Table 2 below.

Table 3: Lead Concentrations in Paints

Location / Description	Lead Concentration (mg/kg)	Lead Concentration (%)
LP1, Boiler Room Ceiling – Yellow Paint on Concrete	783	0.078
LP2, Boiler Room Floor – Grey Paint on Concrete	647	0.065
LP3, Gymnasium South Wall – Interior Yellow Paint on Concrete/Plaster	1310	0.13
LP4, Stair 099 – Interior White Paint on Plaster	1790	0.18
LP5, Corridor 005 – Brown Floor Coating on Concrete	206	0.021
LP6, Room 103 – Interior Pink Paint on Plaster	1720	0.17
LP7, Room 104, Interior Blue Paint on Plaster	707	0.071
LP8, Kitchen – Interior Yellow Paint on Drywall	959	0.096
LP9, Room 214 – Blue Window Sill Paint on Wood	258	0.026
LP10, 2nd Floor Corridor, Interior Yellow Paint on Block	1110	0.11

LP11, Ground Floor – Room 103 Cloakroom, Interior Wood Trim Paint	1190	0.12
LP12, Ground Floor, Copy Room 111 – Interior Window Trim Paint	7490	0.75
LP13, Northwest Exterior – Grey Paint	2360	0.24
LP14, Northeast Exterior – Door Paint	130	0.013
LP15, East Side Play Area – Exterior White Paint on Wood	200	0.020
LP16, South Entrance – Exterior Blue Paint on Metal Handrail	1080	0.11
LP17, Daycare Building – Exterior Grey Paint on Wood	2370	0.24
"B" Building – Exterior Grey Paint on Wood Siding	11300	1.1
"B" Building – Beige Wood Trim Paint	10400	1.0
"B" Building – Beige Drywall Paint	<6.0	<0.0006
"B" Building – Beige Paint on Wood Fibreboard	3140	0.31
"B" Building – White Wood Trim Paint	29600	3.0
Portable – Exterior Brown Paint on Wood Siding	3.6	0.00036
Portable – Beige Drywall Paint	3.6	0.00036

The Canadian Hazardous Products Act (CHPA) considers paints with lead levels above 90 mg/kg or 0.009% to be lead containing. WorkSafeBC requires risk assessments for lead exposure for any work that may impact lead containing paints/coatings, even for lead levels below 90 mg/kg if the materials are to be welded, cut, drilled, grinded, or sanded. **Due to the overwhelmingly high number of samples above 90 mg/kg, all paints throughout the Main School Building and the Daycare "B" Building are considered to be lead containing.**

Prior to any renovation activities taking place, risk assessment(s) will be required for the lead containing paints. The risk assessment(s) will be based on the nature of the work affecting the lead containing products (e.g. cutting, manual demolition, sanding, grinding, blasting, etc.) and total area of lead-containing materials to be impacted. The assessment(s) will subsequently determine the special lead precautions, such as personal protective equipment for workers and/or dust suppression methods, required for the work.

The risk assessment may also determine if a hazardous materials abatement contractor is needed to perform the work.

Lead removal procedures based upon the risk assessment(s) will be required once all work requirements are identified. All work impacting the lead containing materials must only be conducted by properly trained personnel under a company lead Exposure Control Plan (ECP).

Two representative samples of lead painted materials, likely to be landfilled, with the highest recorded lead levels, were analyzed for lead leachability. The samples were collected from the main building white painted plaster and the "B" building painted trim materials. The leachate results were recorded to be 1.08 and 2.12 mg/L which are both well below the limit of 5.0 mg/L. Therefore, the lead painted materials in the building can be treated as regular non-leachable waste.

3.2.2 Lead Building Products

The plumbing vent pipes on the roofs of the building are made of lead and are considered to be a disposal issue only.

All ceramic wall and floor tiles found within any washrooms, showers and change rooms are assumed to contain lead glazing, and are subsequently considered lead containing.

3.3 POLYCHLORINATED BIPHENYLS (PCBS)

Fluorescent light fixtures were observed throughout the areas surveyed and may contain PCB ballasts. The fixtures were still energized during the survey, and therefore, no fixtures were opened to inspect the ballasts.

All PCB containing ballasts, or any suspect PCB containing ballasts, requiring removal during renovation must be removed from the fixtures and disposed of in accordance with applicable regulations. If a ballast does not contain PCBs, it will be stated on the ballast label as "no PCBs" or "non-PCB". All ballasts without such a statement on its label must be treated as PCB containing.

The quantity of PCB containing light ballasts listed in Table 1 is based on the quantities typically observed in buildings/schools of similar size/type.

3.4 MERCURY CONTAINING MATERIALS

No mercury containing thermostat switches were observed during the survey, but they may still exist within the building in areas not accessed or plainly visible. If any mercury containing thermostat switches are encountered during the building renovations and require removal, they must be removed and disposed of in accordance with applicable regulations. The mercury containing switches are not considered to be a hazard to workers removing them, as long as care is taken to ensure that the switches remain intact when removed.

Mercury vapour will be present in the fluorescent light tubes found throughout the school. During removal of any fluorescent light fixtures, workers must ensure that care is taken to avoid breaking the tubes and subsequently inhaling the mercury vapour.

3.5 OTHER POTENTIALLY HAZARDOUS MATERIALS

Other potentially hazardous materials inspected include mould, crystalline silica, and chlorofluorocarbon (CFC) products.

3.5.1 Mould

No visible mould was observed during the survey, but may still exist in concealed areas.
During any renovation activities, if mould is encountered by workers, any workers working within the immediate area must wear the appropriate personal protective equipment (e.g. appropriate respirator, disposable suits, etc.) in order to prevent any airborne mould exposure.

3.5.2 Crystalline Silica

Disturbance of Crystalline Silica containing products (e.g. concrete foundation, brick, etc.) may require respiratory protection and/or mechanical ventilation during any demolition activities of those materials. However, as most of these materials are painted with lead containing paint, the silica exposure hazard would be simultaneously addressed by the lead work procedures.

3.5.3 Chlorofluorocarbons (CFCs)

The refrigeration and/or air conditioning equipment within the building may have chlorofluorocarbon (CFC) containing refrigerants. If the equipment must be removed (e.g. for renovation), then they must be removed in its entirety and properly disposed of, or the refrigerants must be captured by a licensed refrigeration mechanic.

3.5.4 Underground Storage Tank

An underground storage tank (UST) is expected to exist on the property, most likely on the East side of the building outside of the boiler room area. VSB records could not be located to confirm this.

The tank will require proper removal and disposal prior to any work taking place which could impact the tank. A soil sampling closure report will be required upon completion of the tank removal and any contaminated soil removal.

4.0 RECOMMENDATIONS

The hazardous materials in their current states do not pose a hazard to workers or occupants within the school. Immediate removal of the materials is not required if the materials are left undisturbed.

However, the materials will become hazardous if they are impacted. Therefore, prior to any renovation/demolition activities taking place which may impinge upon the asbestos containing or other hazardous materials found within the school, the following must be performed:

1.) Risk assessments and/or safe work procedures are required prior to disturbing any of the identified hazardous materials. For asbestos and lead containing materials, a Notice of Project (NOP) must also be submitted to WorkSafeBC a minimum of 48 hours prior to impacting said materials. All work impacting the hazardous materials must only be conducted by trained personnel, under a company Exposure Control Plan (ECP) for the specific hazardous material(s) being impacted.

2.) If any suspect asbestos or lead containing materials are encountered within walls, above ceilings, or under floors during renovation activities, the work in the immediate area must stop and the materials must be inspected by a qualified individual as per WorkSafeBC OH&S Regulation 20.112.

3.) Disturbance of Crystalline Silica containing products (e.g. concrete, ceramic, etc.) may require respiratory protection and/or mechanical ventilation during any demolition activities.

4.) Any PCB containing light ballasts and mercury containing thermostat switches requiring removal during renovation must be removed and disposed of in accordance with applicable regulations and procedures.

5.) Workers removing any fluorescent light fixtures during renovations must ensure that care is taken to avoid breaking the light tubes and subsequently inhaling the mercury vapour found within the tubes.

6.) If any refrigeration or air conditioning equipment must be removed, then they must be removed in its entirety and properly disposed of, or the CFC refrigerants must be captured by a licensed refrigeration mechanic.

5.0 STATEMENT OF LIMITATIONS

The A.C.M. Environmental Corporation (ACM) report is intended to direct the Client's attention to recognised environmental conditions and to potential sources of environmental contamination. The findings and conclusion regarding contamination of the property are based solely on the extent of observations and information gathered during the assessment. Nothing in the report is intended to express any legal opinion upon environmental liabilities relating to the site or whether operations legally conformed with relevant legislative requirements.

Furthermore, it must be understood that changing circumstances in the physical environment, the use of the property, as well as the changes in any substances stored, used, handled at the property, could radically alter the conclusions and information contained in this report. Therefore, it is important that the property is periodically re-evaluated and the client kept informed as to developments, which may impact the properties.

ACM makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in this report, including, but not limited to, ownership of any properties, or the application of any law to the facts set forth herein. With respect to regulatory compliance issues, regulatory statutes are subject to interpretation and these interpretations may change over time. ACM accepts no responsibility for consequential financial effects on transactions or property values, or requirements for follow up actions and costs.

The liability of ACM or its staff will be limited to the lesser of the fees paid or actual damages incurred by the client. ACM will not be responsible for any consequential or indirect damages. ACM is only responsible for damages resulting from negligence of ACM.

Information provided by ACM is intended for Client use only. Any use by a third party of reports or documents authored by ACM or any reliance by a third party on or decisions made by a third party based on findings described in said documents is the sole responsibility of such third parties. ACM accepts no responsibility for damages suffered by any third party. **This report is not intended as contract specifications or site specific procedures.**

A.C.M. ENVIRONMENTAL CORPORATION **Reviewed By:**

Brian Saarela, CEI, ABI, CLRA
Senior Project Manager

Jari Saarela, CEI, LPD, WRT, ABI
President

6.0 REFERENCES

1) USEPA. 1985. U.S. Environmental Protection Agency. "Guidance for Controlling Asbestos-Containing Materials in Buildings". Washington, DC: Office of Toxic Substances, USEPA.

2) Lory EE, Coin DC. 1981. "Management Procedure for Assessment of Friable Asbestos Insulating Material". Port Hueneme, CA: Civil Engineering Laboratory, Naval Construction Battalion Center.

3) OSHA 29 CFR 1926.62, Lead Standard. Occupational Safety & Health Administration, 200 Constitution Avenue, NW Washington, DC 20210

4) WorkSafeBC. Occupational Health and Safety Regulation, including all current amendments and guidelines.

5) 2017 Edition - WorkSafeBC. Safe Work Practices for Handling Asbestos.

6) 2017 Edition - WorkSafeBC. Safe Work Practices for Handling Lead.

APPENDIX A

Asbestos Bulk Sample Results

ACM ENVIRONMENTAL CORPORATION

Asbestos Bulk Sample Results

Client: Vancouver School Board - Planning and Facilities
Project #: 3141-2794 (Spreadsheet #1)
Location: Sir David Livingstone Elementary School, Vancouver, BC
Date: 15-Nov-18
Submitted By: Brian Saarela (ACM)
Submission Date: 13-Nov-18

The samples below have been analyzed in accordance with NIOSH Method 9002, Issue 2

				ASBESTOS RESULT		OTHER FIBRES DETECTED		NON-FIBROUS MATERIALS		
SAMPLE NUMBER	SAMPLE LOCATION & DESCRIPTION	PHASE / LAYER DESCRIPTION	PHASE / LAYER CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	LAB ANALYST
3141.7134	#1 - Fan Room 024, South Wall Old Silver Duct Mastic	1) Hardened Silver Mastic	100%	Chrysotile	1-5%	None Detected	N/A	Adhesive	95-99%	PL
3141.7135	#2 - Fan Room 024, AHU #2, Duct Flange/Penetration Grey Putty	1) Paint 2) Soft Grey Putty Compound 2) Stretchy Grey Putty Compound	4% 90% 6%	None Detected None Detected None Detected	N/A N/A N/A	None Detected Cellulose None Detected	N/A 6% N/A	Paint Putty Compound Putty Compound	100% 94% 100%	PL
3141.7136	#3 - Fan Room 024, West Wall Fill Material	1) Brown/Grey Compound	100%	Chrysotile	1-5%	None Detected	N/A	Cement, Sand, Fillers, Binders, Mica, Vermiculite	95-99%	PL
3141.7137	#4 - Fan Room 024, New Ducting Silver/Grey Caulking	1) Stretchy Grey Caulking	100%	None Detected	N/A	Glass	4%	Caulking Compound	96%	PL
3141.7138	#5 - Boiler Room 025, Chimney Concrete Coating	1) Paint 2) Grey Cement/Sand Mixture 3) Paint 4) Light Grey Cement/Sand Mixture	3% 90% 2% 5%	None Detected Chrysotile None Detected None Detected	N/A 5-10% N/A N/A	None Detected None Detected None Detected None Detected	N/A N/A N/A N/A	Paint Cement, Sand, Quartz Paint Cement, Sand, Quartz	100% 90-95% 100% 100%	PL
3141.7139	#6 - Boiler Room 025, West Wall Concrete Coating	1) Paint 2) Grey Cement/Sand Mixture	60% 40%	None Detected Chrysotile	N/A 1-5%	None Detected None Detected	N/A N/A	Paint Cement, Sand, Quartz, Glass, Vermiculite	100% 95-99%	PL
3141.7140	#7 - Boiler Room 025, New Boiler Exhaust Ducting Red Caulking	1) Stretchy Red Caulking	100%	None Detected	N/A	None Detected	N/A	Caulking Compound	100%	PL
3141.7141	#8 - Conducted Room 023A 12" Grey Vinyl Floor Tile	1) Grey Vinyl Material 2) Soft Black Mastic	98% 2%	None Detected None Detected	N/A N/A	None Detected None Detected	N/A N/A	Vinyl, Quartz, Glass Tar, Adhesive	100% 100%	PL
3141.7142	#9 - Corridor 023 9" Red Vinyl Floor Tile	1) Red Vinyl Material 2) Soft Black Mastic	96% 4%	Chrysotile None Detected	1-5% N/A	None Detected None Detected	N/A N/A	Vinyl, Glass Tar, Adhesive	95-98% 100%	PL
3141.7143	#10 - Kitchen 022A Grey Vinyl Sheet Flooring	1) Grey Vinyl Material 2) White Woven Mesh 3) Soft Beige Adhesive 4) Soft Black Mastic	85% 10% 4% 1%	None Detected None Detected None Detected None Detected	N/A N/A N/A N/A	None Detected Glass None Detected None Detected	N/A 100% N/A N/A	Vinyl None Detected Adhesive Tar, Adhesive	100% N/A 100% 100%	PL
3141.7144	#11 - Kitchen 022A Beige Vinyl Sheet Flooring	1) Beige Vinyl Material 2) White Spongy Foam 3) White Woven Mesh 4) Beige Spongy Foam 5) Soft Brown Adhesive 6) Soft Black Mastic	24% 20% 10% 4% 2% 40%	None Detected None Detected None Detected None Detected None Detected None Detected	N/A N/A N/A N/A N/A N/A	None Detected None Detected Glass None Detected None Detected None Detected	N/A N/A 100% N/A N/A N/A	Vinyl Spongy Foam None Detected Spongy Foam Adhesive Tar, Adhesive	100% 100% N/A 100% 100% 100%	EH
3141.7145	#12 - Kitchen 022A Drywall Taping Compound	1) Paint 2) Hard White Mud Compound	4% 96%	None Detected None Detected	N/A N/A	None Detected Cellulose	N/A 2%	Paint Mud Compound	100% 98%	EH
3141.7146	#13 - Boy's Change Room 022, Behind Fountain Black Backing Board	1) Black Coating 2) Brown/Grey Fibrous Material	8% 92%	None Detected None Detected	N/A N/A	None Detected Cellulose	N/A 100%	Coating None Detected	100% N/A	EH
3141.7147	#14 - Gymnasium 020, Interior Windows Black Window Mastic	1) Soft Black Mastic 2) Brown Fibrous Mixture	94% 6%	Chrysotile None Detected	1-5% N/A	None Detected Synthetics, Cellulose	N/A 100%	Tar, Adhesive None Detected	95-99% N/A	EH

ACN ENVIRONMENTAL CORPORATION

Asbestos Bulk Sample Results

Client: Vancouver School Board - Planning and Facilities
Location: Sir David Livingstone Elementary School, Vancouver, BC
Submitted By: Brian Saarela (ACM)

Project #: 3141-2794 (Spreadsheet #2)
Date: 15-Nov-18
Submission Date: 13-Nov-18

The samples below have been analyzed in accordance with NIOSH Method 9002, Issue 2.

				ASBESTOS RESULT		OTHER FIBRES DETECTED		NON-FIBROUS MATERIALS		
SAMPLE NUMBER	SAMPLE LOCATION & DESCRIPTION	PHASE / LAYER DESCRIPTION	PHASE / LAYER CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	LAB ANALYST
3141.7146	#15 - Gymnasium Storage 017 9" Light Brown Vinyl Floor Tile	1) Brown/Orange Vinyl Material 2) Soft Black Mastic	98% 2%	Chrysotile None Detected	1-5% N/A	None Detected None Detected	N/A N/A	Vinyl, Glass Tar, Adhesive	95-99% 100%	EH
3141.7149	#16 - Girls Change Room 016 Exterior Window Glazing Putty	1) Paint 2) Hard Beige Putty Compound	4% 96%	None Detected Chrysotile	N/A 1-5%	None Detected None Detected	N/A N/A	Paint Putty Compound	100% 95-99%	AN
3141.7150	#17 - Corridor 013 12" Beige Vinyl Floor Tile	1) Soft Beige/White Adhesive 2) Beige Vinyl Material 3) Soft Black Mastic	4% 90% 6%	None Detected None Detected None Detected	N/A N/A N/A	None Detected None Detected None Detected	N/A N/A N/A	Adhesive Vinyl, Glass Tar, Adhesive	100% 100% 100%	AN
3141.7151	#18 - Storage Room 013A Ceiling Tile Adhesive	1) Brown Fibrous Material 2) Hardened Brown Adhesive	5% 95%	None Detected None Detected	N/A N/A	Cellulose Wollastonite	100% 1%	None Detected Adhesive	N/A 99%	AN
3141.7152	#19 - Corridor 015 12" Red Vinyl Floor Tile	1) Red Vinyl Material 2) Soft Beige/White Adhesive 3) Grey Levelling Compound	93% 5% 2%	None Detected None Detected None Detected	N/A N/A N/A	None Detected None Detected None Detected	N/A N/A N/A	Vinyl, Glass Adhesive Cement, Sand, Glass, Quartz, Vermiculite	100% 100% 100%	AN
3141.7153	#20 - Storage Room 013A 12" Ceiling Tile	1) Paint 2) Brown Fibrous Material	4% 96%	None Detected None Detected	N/A N/A	None Detected Cellulose	N/A 100%	Paint None Detected	100% N/A	AN
3141.7154	#21 - Storage Room 014 12" Cream Vinyl Floor Tile	1) Beige/Cream Vinyl Material 2) Hardened Beige Adhesive	96% 4%	Chrysotile None Detected	1-5% N/A	None Detected None Detected	N/A N/A	Vinyl, Quartz Adhesive	95-99% 100%	PL
3141.7155	#22 - Corridor 015 Drywall Taping Compound	1) Paint 2) Grey Mud Compound	5% 95%	None Detected Chrysotile	N/A 1-5%	None Detected None Detected	N/A N/A	Paint Mud Compound	100% 95-99%	PL
3141.7156	#23 - Storage Room 013A Cove Base Adhesive	1) Brown Fibrous Material 2) Hardened Brown Adhesive 3) Soft Black Mastic	5% 2% 93%	None Detected None Detected Chrysotile	N/A N/A 1-5%	Cellulose None Detected None Detected	100% N/A N/A	None Detected Adhesive Tar, Adhesive	N/A 100% 95-99%	PL
3141.7157	#24 - Library 012, Near Southeast Exit Door Ceiling Tile Adhesive	1) Hardened Brown Adhesive 2) Brown Fibrous Material	85% 15%	None Detected None Detected	N/A N/A	None Detected Cellulose	N/A 100%	Adhesive None Detected	100% N/A	PL
3141.7158	#25 - Library Workroom 012A, Outside Wall Drywall Taping Compound	1) Paint 2) Beige Mud Compound	5% 95%	None Detected Chrysotile	N/A 1-5%	None Detected None Detected	N/A N/A	Paint Mud Compound	100% 95-99%	PL
3141.7159	#26 - Library 012, Southeast Exit Door Surround Drywall Taping Compound	1) Paint 2) Grey Mud Compound	4% 96%	None Detected Chrysotile	N/A 1-5%	None Detected None Detected	N/A N/A	Paint Mud Compound	100% 95-99%	EH
3141.7160	#27 - Multipurpose Room 009, Ceiling Beam Plaster	1) Paint 2) White/Beige Plaster	6% 94%	None Detected None Detected	N/A N/A	None Detected None Detected	N/A N/A	Paint Plaster	100% 100%	EH
3141.7161	#28 - Multipurpose Room 009 Ceiling Tile Adhesive	1) Hardened Brown Adhesive 2) Paper	96% 4%	None Detected None Detected	N/A N/A	None Detected Cellulose	N/A 100%	Adhesive None Detected	100% N/A	EH
3141.7162	#29 - Boy's Washroom 027 Drywall Taping Compound	1) Paint 2) White Mud Compound	4% 96%	None Detected None Detected	N/A N/A	None Detected None Detected	N/A N/A	Paint Mud Compound	100% 100%	EH
3141.7163	#30 - Girl's Washroom 026 Drywall Taping Compound	1) Paint 2) White Mud Compound	4% 96%	None Detected None Detected	N/A N/A	None Detected None Detected	N/A N/A	Paint Mud Compound	100% 100%	EH

ACM ENVIRONMENTAL CORPORATION

Asbestos Bulk Sample Results

Client: Vancouver School Board - Planning and Facilities
Location: Sir David Livingstone Elementary School, Vancouver, BC
Submitted By: Brian Saarela (ACM)

Project #: 3141-2794 (Spreadsheet #3)
Date: 15-Nov-18
Submission Date: 13-Nov-18

The samples below have been analyzed in accordance with NIOSH Method 9002, Issue 2.

				ASBESTOS RESULT		OTHER FIBRES DETECTED		NON-FIBROUS MATERIALS		
SAMPLE NUMBER	SAMPLE LOCATION & DESCRIPTION	PHASE / LAYER DESCRIPTION	PHASE / LAYER CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	LAB ANALYST
3141.7164	#31 - Fan Room 010, South Wall Black Insulation Mastic	1) Soft Black Mastic 2) Brown/White Fibrous Material 3) Grey Cement/Sand Mixture	95% 2% 3%	None Detected None Detected None Detected	N/A N/A N/A	Glass Glass None Detected	1% 100% N/A	Tar, Adhesive None Detected Cement, Sand, Glass, Quartz	99% N/A 100%	AH
3141.7165	#32 - Fan Room 010, South Wall Plaster/Brick Mortar	1) Paint 2) White Plaster 3) Grey Cement/Sand Mixture	4% 22% 74%	None Detected None Detected None Detected	N/A N/A N/A	None Detected None Detected None Detected	N/A N/A N/A	Paint Plaster Cement, Sand, Glass, Quartz, Vermiculite	100% 100% 100%	AH
3141.7166	#33 - Fan Room 010, Duct Riser beside Entrance Silver/Gold Duct Mastic	1) Soft Silver/Gold Putty Compound	100%	Chrysotile	1-5%	None Detected	N/A	Putty Compound	95-99%	AH
3141.7167	#34 - Storage Room 004 Wall Plaster	1) Paint 2) Soft Beige Adhesive 3) White Plaster	4% 94% 2%	None Detected None Detected None Detected	N/A N/A N/A	None Detected None Detected Cellulose	N/A N/A 1%	Paint Adhesive Plaster, Glass, Quartz, Rocks	100% 100% 99%	AH
3141.7168	#35 - Corridor 005, East Stair Door Surround Drywall Taping Compound	1) Paint 2) White Mud Compound	4% 96%	None Detected None Detected	N/A N/A	None Detected None Detected	N/A N/A	Paint Mud Compound	100% 100%	AH
3141.7169	#36 - Room 104, Windows - Exterior Exterior Frame Caulking	1) Paint 2) Soft White Caulking Compound 3) Paint 4) Soft Grey Caulking Compound 5) Grey Cement/Sand Mixture	6% 36% 6% 42% 10%	None Detected None Detected None Detected None Detected None Detected	N/A N/A N/A N/A N/A	None Detected Synthetics None Detected Glass None Detected	N/A 3% N/A 4% N/A	Paint Caulking Compound Paint Caulking Compound Cement, Sand, Glass	100% 97% 100% 96% 100%	EH
3141.7170	#37 - Room 104, Windows - Exterior Exterior Glazing Putty	1) Paint 2) Hardened White Putty Compound	6% 94%	None Detected None Detected	N/A N/A	None Detected None Detected	N/A N/A	Paint Putty Compound	100% 100%	EH
3141.7171	#38 - Room 104, Floor Penetrations Black Patch/Fill Material	1) Hard Grey Compound	100%	None Detected	N/A	None Detected	N/A	Compound, Fillers	100%	EH
3141.7172	#39 - Room 104 Wall Plaster	1) Paint 2) White Plaster 3) Grey Cement/Sand Mixture	4% 40% 56%	None Detected None Detected None Detected	N/A N/A N/A	None Detected None Detected Cellulose	N/A N/A 4%	Paint Plaster Cement, Sand, Glass, Quartz, Vermiculite	100% 100% 96%	EH
3141.7173	#40 - Staff Room 106 Linoleum Flooring	1) Beige Vinyl Material 2) Brown Felt Backing 3) Soft Brown Adhesive	70% 29% 1%	None Detected None Detected None Detected	N/A N/A N/A	None Detected Glass, Cellulose None Detected	N/A 20-40% N/A	Vinyl Fillers, Binders Adhesive	100% 60-80% 100%	EH
3141.7174	#41 - Staff Room 106 2'x4' Ceiling Tile, Large Fissures	1) Brown Fibrous Mixture	100%	None Detected	N/A	Glass, Cellulose	20-40%	Fillers, Perlite	60-80%	PL
3141.7175	#42 - Staff Room 106 2'x4' Ceiling Tile, Small Fissures	1) Beige/Brown Fibrous Mixture	100%	None Detected	N/A	Glass, Cellulose	20-40%	Fillers, Perlite	60-80%	PL
3141.7176	#43 - Staff Room 106, Above T-Bar Ceiling Old Ceiling Tile Adhesive	1) Paint 2) Hardened Dark Brown Adhesive 3) Brown Fibrous Material	2% 80% 15%	None Detected None Detected None Detected	N/A N/A N/A	None Detected None Detected Cellulose	N/A N/A 100%	Paint Adhesive None Detected	100% 100% N/A	PL
3141.7177	#44 - Staff Room 106, Kitchen Drywall Taping Compound	1) Paint 2) White/Beige Mud Compound	5% 95%	None Detected None Detected	N/A N/A	None Detected None Detected	N/A N/A	Paint Mud Compound	100% 100%	PL

Proficiency is obtained through the American Industrial Hygiene Association (AIHA) AIHA

ACM ENVIRONMENTAL CORPORATION

Asbestos Bulk Sample Results

Client: **Vancouver School Board - Planning and Facilities**
Location: **Sir David Livingstone Elementary School, Vancouver, BC**
Submitted By: **Brian Saanla (ACM)**

Project #: 3141-2794 (Spreadsheet #4)
Date: 15-Nov-18
Submission Date: 13-Nov-18

The samples below have been analyzed in accordance with NIOSH Method 9002, Issue 2.

				ASBESTOS RESULT		OTHER FIBRES DETECTED		NON-FIBROUS MATERIALS		
SAMPLE NUMBER	SAMPLE LOCATION & DESCRIPTION	PHASE / LAYER DESCRIPTION	PHASE / LAYER CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	LAB ANALYST
3141.7178	#45 - Office Meeting Room 114 Drywall Taping Compound	1) Paint 2) White Mud Compound 3) Paper	10% 80% 10%	None Detected None Detected None Detected	N/A N/A N/A	None Detected None Detected Cellulose	N/A N/A 100%	Paint Mud Compound None Detected	100% 100% N/A	PL
3141.7179	#46 - Office Meeting Room 114, Under Carpet Flooring	1) Hardened Brown/Yellow Adhesive 2) Brown/Orange Vinyl Material 3) Brown Fibrous Material	4% 94% 2%	None Detected None Detected None Detected	N/A N/A N/A	None Detected Cellulose Glass	N/A 1% 100%	Adhesive Vinyl None Detected	100% 99% N/A	AN
3141.7180	#47 - Stair 207 Grey Stair Tread	1) Grey Vinyl Material	100%	None Detected	N/A	None Detected	N/A	Vinyl, Glass	100%	AN
3141.7181	#48 - Corridor 200, North End Windows Black Glazing Mastic	1) Soft Black Mastic	100%	None Detected	N/A	None Detected	N/A	Tar, Adhesive	100%	AN
3141.7182	#49 - Room 218, Aluminum Windows Black Glazing Mastic	1) Soft Black Mastic	100%	None Detected	N/A	Cellulose, Synthetics	5-10%	Tar, Adhesive	90-95%	AN
3141.7183	#50 - Corridor 200, Exterior Wall above Ceiling Insulation	1) Brown Fibrous Material	100%	None Detected	N/A	Glass	100%	None Detected	N/A	AN
3141.7184	#51 - Corridor 200, Duct Surround Drywall Taping Compound	1) Paint 2) White Mud Compound	4% 96%	None Detected None Detected	N/A N/A	None Detected None Detected	N/A N/A	Paint Mud Compound	100% 100%	EH
3141.7185	#52 - Corridor 200, Outside Room 210, Above Door Drywall Taping Compound	1) Paint 2) Grey Mud Compound	4% 96%	None Detected Chrysotile	N/A 1-5%	None Detected None Detected	N/A N/A	Paint Mud Compound	100% 95-99%	EH
3141.7186	#53 - Office 101, Under Carpet Flooring	1) Hardened Brown Adhesive 2) Grey Cement/Sand Mixture	26% 74%	None Detected None Detected	N/A N/A N/A	Synthetics Cellulose	2% 2%	Adhesive Cement, Sand, Glass, Quartz, Vermiculite	98% 98%	EH
3141.7187	#54 - Northeast Exterior Door Window Glazing Mastic	1) Soft Black Mastic	100%	None Detected	N/A	Cellulose	2%	Tar, Adhesive	98%	EH
3141.7188	#55 - Northwest Exterior, on Concrete Paint/Coating	1) Multi-Layers of Paint 2) Beige Cement/Sand Mixture	76% 24%	None Detected None Detected	N/A N/A	None Detected None Detected	N/A N/A	Paint Cement, Sand, Glass, Quartz, Vermiculite	100% 100%	EH
3141.7189	#56 - Southeast Exterior Textured Plaster Coat	1) Paint 2) Soft Black Mastic	48% 52%	None Detected Chrysotile	N/A 1-5%	None Detected Cellulose	N/A 1%	Paint Tar, Adhesive	100% 94-99%	AN
3141.7190	#57 - Exterior outside Multipurpose Room 009 Textured Plaster Coat	1) Paint 2) Soft Black Mastic 3) Grey Cement/Sand Mixture	5% 5% 90%	None Detected Chrysotile None Detected	N/A 1-5% N/A	None Detected Cellulose None Detected	N/A 1% N/A	Paint Tar, Adhesive Cement, Sand, Glass, Quartz, Vermiculite	100% 94-98% 100%	AN
3141.7191	#58 - South Entrance Exterior Brick Mortar	1) Grey Cement/Sand Mixture	100%	None Detected	N/A	None Detected	N/A	Cement, Sand, Glass, Quartz, Vermiculite	100%	AN
3141.7192	#59 - South Exterior Retaining Wall Stone Grout/Mortar	1) Hard Grey Grout Compound	100%	None Detected	N/A	None Detected	N/A	Cement, Sand, Glass, Quartz, Vermiculite	100%	AN

Proficiency is obtained through the American Industrial Hygiene Association (AIHA) AIHA

ACM ENVIRONMENTAL CORPORATION

Asbestos Bulk Sample Results

Client: Vancouver School Board - Planning and Facilities
Location: Sir David Livingstone Elementary School, Vancouver, BC
Submitted By: Callum Armour (ACM)

Project #: 3141-2794 (Spreadsheet #5)
Date: 21-Nov-18
Submission Date: 16-Nov-18

The samples below have been analyzed in accordance with NIOSH Method 9002, Issue 2

				ASBESTOS RESULT		OTHER FIBRES DETECTED		NON-FIBROUS MATERIALS		
SAMPLE NUMBER	SAMPLE LOCATION & DESCRIPTION	PHASE / LAYER DESCRIPTION	PHASE / LAYER CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	LAB ANALYST
3141-7193	Roof, Main Roof, West Side Roofing Membrane	1) Multi-Layers of Soft Black Mastic	12%	None Detected	N/A	Glass	3%	Tar, Adhesive	97%	AH
		2) Multi-Layers of Black Fibrous Felt	16%	None Detected	N/A	Cellulose, Synthetics	48%	Tar, Adhesive	52%	
		3) Multi-Layers of Soft Black Mastic	18%	None Detected	N/A	Glass	2%	Tar, Adhesive	98%	
		4) Multi-Layers of Brown Fibrous Felt	22%	None Detected	N/A	Cellulose	56%	Tar, Adhesive	44%	
		5) Brown Fibrous Material	10%	None Detected	N/A	Cellulose	100%	None Detected	N/A	
		6) Yellow Styrofoam	14%	None Detected	N/A	None Detected	N/A	Styrofoam	100%	
3141-7194	Roof, Low Roof, South Area & Covered Area Roofing Membrane	1) Soft Black Mastic	2%	None Detected	N/A	None Detected	N/A	Tar, Adhesive	100%	PL
		2) Black Fibrous Felt	8%	None Detected	N/A	Cellulose, Synthetics	48%	Tar, Adhesive	52%	
		3) Multi-Layers of Soft Black Mastic	6%	None Detected	N/A	None Detected	N/A	Tar, Adhesive	100%	
		4) Multi-Layers of Black Fibrous Felt	12%	None Detected	N/A	Glass	16%	Tar, Adhesive	84%	
		5) Multi-Layers of Soft Black Mastic	6%	None Detected	N/A	None Detected	N/A	Tar, Adhesive	100%	
		6) Multi-Layers of Black Fibrous Felt	12%	None Detected	N/A	Synthetics	44%	Tar, Adhesive	56%	
		7) Brown Fibrous Material	22%	None Detected	N/A	Cellulose	100%	None Detected	N/A	
		8) Soft Black Mastic	2%	None Detected	N/A	None Detected	N/A	Tar, Adhesive	100%	
		9) Brown Fibrous Material	10%	None Detected	N/A	Cellulose	100%	None Detected	N/A	
		10) Yellow Styrofoam	20%	None Detected	N/A	None Detected	N/A	Styrofoam	100%	

ACM ENVIRONMENTAL CORPORATION

Asbestos Bulk Sample Results

Client: Vancouver School Board - Planning and Facilities
Location: Sir David Livingstone Elementary School, Vancouver, BC
Submitted By: Callum Armour (ACM)
Project #: 3141-2794 (Spreadsheet #6)
Date: 27-Nov-18
Submission Date: 27-Nov-18

The samples below have been analyzed in accordance with NIOSH Method 9002, issue 2.

				ASBESTOS RESULT		OTHER FIBRES DETECTED		NON-FIBROUS MATERIALS		
SAMPLE NUMBER	SAMPLE LOCATION & DESCRIPTION	PHASE / LAYER DESCRIPTION	PHASE / LAYER CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	LAB ANALYST
3141.7197	Main School, Attic, North Brick Mortar	1) Grey Cement/Sand Mixture	100%	None Detected	N/A	None Detected	N/A	Cement, Sand, Quartz, Glass	100%	PL
3141.7198	Main School, Attic, North Grey Duct Mastic	1) Stretchy Grey Mastic	100%	None Detected	N/A	Glass, Synthetics	4%	Adhesive	96%	PL
3141.7199	Main School, Attic, West Grey Duct Mastic	1) Stretchy Grey Mastic	100%	None Detected	N/A	Glass, Synthetics	4%	Adhesive	96%	PL
3141.7200	Main School, Attic, Northwest Grey Duct Mastic	1) Stretchy Grey Mastic	100%	None Detected	N/A	Glass, Synthetics	4%	Adhesive	96%	PL
3141.7201	Main School, Attic, Under Insulation, Centre Black Tar	1) Hardened Black Mastic	100%	None Detected	N/A	None Detected	N/A	Tar, Adhesive	100%	PL
3141.7202	Main School, Attic, Centre Blown In Insulation	1) Multi-Coloured Fibrous Material 2) Hard White Plaster	92% 8%	None Detected None Detected	N/A N/A	Cellulose None Detected	100% N/A	None Detected Plaster	N/A 100%	AN
3141.7203	B Building, Corridor White Duct Mastic	1) Soft White Mastic	100%	None Detected	N/A	Cellulose	6%	Adhesive	94%	AN
3141.7204	B Building, Corridor White Vent Damper	1) Stretchy White/Beige Material 2) Soft Brown Adhesive 3) White Fibrous Material 4) Soft Brown Adhesive 5) Stretchy White/Beige Material	24% 2% 48% 2% 24%	None Detected None Detected None Detected None Detected None Detected	N/A N/A N/A N/A N/A	None Detected None Detected Glass None Detected None Detected	N/A N/A 100% N/A N/A	Fillers, Binders Adhesive None Detected Adhesive Fillers, Binders	100% 100% N/A 100% 100%	AN
3141.7205	B Building, B101, South Wall Drywall Taping Compound	1) Paint 2) White Mud Compound	4% 96%	None Detected None Detected	N/A N/A	None Detected None Detected	N/A N/A	Paint Mud Compound	100% 100%	AN
3141.7206	B Building, B101, East Wall Drywall Taping Compound	1) Paint 2) White Mud Compound	6% 94%	None Detected None Detected	N/A N/A	None Detected None Detected	N/A N/A	Paint Mud Compound	100% 100%	AN
3141.7207	B Building, B101, under Sink White Damper Mastic	1) Soft White Mastic	100%	None Detected	N/A	Cellulose	4%	Adhesive, Fillers	96%	EH
3141.7208	B Building, B101, outside Staff Washroom Green Vinyl Sheet Flooring	1) Green Vinyl Material 2) Brown Woven Mesh 3) Wood	90% 8% 2%	None Detected None Detected None Detected	N/A N/A N/A	Cellulose Straw None Detected	4% 100% N/A	Vinyl None Detected Wood	96% N/A 100%	EH
3141.7209	B Building, B101B Red Vinyl Floor Tile	1) Red Vinyl Materia 2) Black Fibrous Felt 3) Wood	60% 34% 6%	Chrysotile None Detected None Detected	1-5% N/A N/A	None Detected Synthetics, Cellulose None Detected	N/A 40-60% N/A	Vinyl, Glass, Quartz Tar, Adhesive Wood	95-99% 40-60% 100%	EH
3141.7210	B Building, Low Roof above Entrance Roofing Shingles	1) Small Grey Rocks 2) Soft Black Mastic 3) Black Fibrous Felt 4) Soft Black Mastic 5) Paint	10% 8% 76% 5% 1%	None Detected None Detected None Detected None Detected None Detected	N/A N/A N/A N/A N/A	None Detected None Detected Glass None Detected None Detected	N/A N/A 52% N/A N/A	Rocks Tar, Adhesive Tar, Adhesive Sand, Tar, Adhesive Paint	100% 100% 48% 100% 100%	EH

Proficiency is attained through the American Industrial Hygiene Association (AIHA) AIHA

ACM ENVIRONMENTAL CORPORATION

Asbestos Bulk Sample Results

Client: Vancouver School Board - Planning and Facilities
Project #: 3141-2794 (Spreadsheet #7)
Location: Sir David Livingstone Elementary School, Vancouver, BC
Date: 27-Nov-18
Submitted By: Callum Armour (ACM)
Submission Date: 27-Nov-18

The samples below have been analyzed in accordance with NIOSH Method 9002, Issue 2.

				ASBESTOS RESULT		OTHER FIBRES DETECTED		NON-FIBROUS MATERIALS		
SAMPLE NUMBER	SAMPLE LOCATION & DESCRIPTION	PHASE / LAYER DESCRIPTION	PHASE / LAYER CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	TYPE	CONTENT % (Vol/Vol)	LAB ANALYST
3141.7211	B Building, East Side Roofing Shingles	1) Small Grey Rocks	12%	None Detected	N/A	None Detected	N/A	Rocks	100%	EH
		2) Soft Black Mastic	8%	None Detected	N/A	None Detected	N/A	Tar, Adhesive	100%	
		3) Black Fibrous Felt	50%	None Detected	N/A	Glass	52%	Tar, Adhesive	48%	
		4) Soft Black Mastic	6%	None Detected	N/A	None Detected	N/A	Tar, Adhesive	100%	
		5) Black Fibrous Felt	20%	None Detected	N/A	Synthetics, Cellulose	48%	Tar, Adhesive	52%	
3141.7212	B Building, Northwest Corner Roofing Shingles	1) Small Grey Rocks	6%	None Detected	N/A	None Detected	N/A	Rocks	100%	AN
		2) Soft Black Mastic	10%	None Detected	N/A	None Detected	N/A	Tar, Adhesive	100%	
		3) Black Fibrous Felt	68%	None Detected	N/A	Glass	40-60%	Tar, Adhesive	40-60%	
		4) Soft Black Mastic	10%	None Detected	N/A	None Detected	N/A	Tar, Adhesive, Glass, Quartz	100%	
		5) Paint	2%	None Detected	N/A	None Detected	N/A	Paint	100%	
		6) Black Fibrous Felt	4%	None Detected	N/A	Cellulose	40-60%	Tar, Adhesive	40-60%	
3141.7213	Portable, Washroom Corridor 2x4 Ceiling Tile (Big Streaks)	1) Paint	2%	None Detected	N/A	None Detected	N/A	Paint	100%	AN
		2) Brown Fibrous Mixture	98%	None Detected	N/A	Cellulose, Glass	40-60%	Fillers, Perlite	40-60%	
3141.7214	Portable, Washroom Corridor 2x4 Ceiling Tile (Small Streaks)	1) Paint	4%	None Detected	N/A	None Detected	N/A	Paint	100%	AN
		2) Grey Fibrous Mixture	96%	None Detected	N/A	Cellulose, Glass	40-60%	Fillers, Perlite	40-60%	
3141.7215	Portable, Kitchen Black Cove Base	1) Black Vinyl Material	92%	None Detected	N/A	None Detected	N/A	Vinyl	100%	AN
		2) Soft Brown Adhesive	6%	None Detected	N/A	None Detected	N/A	Adhesive	100%	
		3) Paint	2%	None Detected	N/A	None Detected	N/A	Paint	100%	
3141.7216	Portable, Kitchen, under Sink White Mastic Damper	1) Soft White Material	100%	None Detected	N/A	Cellulose	6%	Fillers, Binders	94%	AN
3141.7217	Portable, Kitchen Drywall Taping Compound	1) Soft Brown Adhesive	4%	None Detected	N/A	None Detected	N/A	Adhesive	100%	PL
		2) Paint	6%	None Detected	N/A	None Detected	N/A	Paint	100%	
		3) White Mud Compound	90%	None Detected	N/A	None Detected	N/A	Mud Compound	100%	
3141.7218	Portable, Main Area, Middle Window Black Window Mastic	1) Soft Black Mastic	100%	None Detected	N/A	Cellulose	2%	Tar, Adhesive	98%	PL
3141.7219	Portable, Main Area Brown Mottled Vinyl Floor Tile	1) Brown Vinyl Material	90%	None Detected	N/A	None Detected	N/A	Vinyl, Quartz, Glass	100%	PL
		2) Soft Beige Adhesive	5%	None Detected	N/A	None Detected	N/A	Adhesive	100%	
		3) Wood	5%	None Detected	N/A	None Detected	N/A	Wood	100%	
3141.7220	Portable, Main Area 2x4 Ceiling Tile (Big Streaks)	1) Paint	5%	None Detected	N/A	None Detected	N/A	Paint	100%	PL
		2) Grey Fibrous Mixture	95%	None Detected	N/A	Cellulose, Glass	40-60%	Fillers, Perlite	40-60%	
3141.7221	Portable, Main Area 2x4 Ceiling Tile (Small Streaks)	1) Paint	5%	None Detected	N/A	None Detected	N/A	Paint	100%	PL
		2) Light Grey Fibrous Mixture	95%	None Detected	N/A	Cellulose, Glass	40-60%	Fillers, Perlite	40-60%	
3141.7222	Portable, Main Corridor 2x4 Ceiling Tile (Big Streaks)	1) Paint	4%	None Detected	N/A	None Detected	N/A	Paint	100%	EH
		2) Beige Fibrous Mixture	96%	None Detected	N/A	Glass, Cellulose	40-60%	Perlite, Fillers	40-60%	
3141.7223	Portable, Main Corridor, beside Entrance Drywall Taping Compound	1) Paint	4%	None Detected	N/A	None Detected	N/A	Paint	100%	EH
		2) White Mud Compound	96%	None Detected	N/A	None Detected	N/A	Mud Compound	100%	
3141.7224	Portable, Women's Washroom Drywall Taping Compound	1) Paint	6%	None Detected	N/A	None Detected	N/A	Paint	100%	EH
		2) White Mud Compound	94%	None Detected	N/A	None Detected	N/A	Mud Compound	100%	
3141.7225	Portable, Men's Washroom Dark Beige Vinyl Sheet Flooring	1) Beige Vinyl Material	88%	None Detected	N/A	Cellulose	4%	Vinyl	96%	EH
		2) Brown Woven Mesh	12%	None Detected	N/A	Straw	100%	None Detected	N/A	
		3) Soft Brown Adhesive	2%	None Detected	N/A	None Detected	N/A	Adhesive	100%	
		4) Wood	20%	None Detected	N/A	None Detected	N/A	Wood	100%	

Proficiency is obtained through the American Industrial Hygiene Association (AIHA) AIHA

APPENDIX B

Asbestos Bulk Sample Results from VSB Maintenance

Building Number	Key Plan Number	Location	Specific Location	Material	Material Description	Asbestos Type	Date
043A	001	Basement	Classroom, center of ceiling west side	Adhesive	Ceiling tile (flexible beige)	None	09-05-11
043A	009	Basement	Basement lunch room ceiling center west wall	Adhesive	Ceiling tile (brittle dark brown)	None	09-05-13
043A	012	Basement	Library south east corner ceiling near exit doors	Adhesive	Ceiling tile brown hard	None	12-06-06
043A	013A	Basement	Store room ceiling	Adhesive	Ceiling tile (brittle dark brown)	Chrysotile	09-05-13
043A	013A	Basement	Store room ceiling outside library	Adhesive	Ceiling tile (brittle dark brown)	Chrysotile	09-05-11
043A	100	Ground Floor	Hallway outside room 108	Adhesive	Ceiling tile(soft beige)	None	09-05-13
043A	100	Ground Floor	Corridor outside general office	Adhesive	Ceiling tile (brittle lighter brown	None	09-05-11
043A	101	Ground Floor	East wall behind donna conna tack board ceiling tile type glue	Adhesive	Ceiling tile brown brittle	None	09-05-21
043A	103	Ground Floor	Classroom south west corner of ceiling	Adhesive	ceiling tile brown hard	None	12-06-06
043A	104	Ground Floor	Classroom	Adhesive	Ceiling tile (brittle brown)	None	10-12-03
043A	106	Ground Floor	Staff room wall panel adhesive	Adhesive	Panel	None	09-07-16
043A	107	Ground Floor	Kindergarten north east corner of ceiling	Adhesive	ceiling tile brown hard	None	12-06-06
043A	112	Ground Floor	Vestibule outside staff washroom	Adhesive	Ceiling tile (brittle lighter brown	None	09-05-11
043A	200	Second Floor	Hallway outside room 209 (three layers including tar)	Adhesive	Ceiling tile (brown)	None	09-05-13
043A	209	Second Floor	Classroom	Adhesive	Ceiling tile (brown brittle)	None	10-12-03
043A	209B	Second Floor	Classroom storeroom ceiling	Adhesive	Ceiling tile (grey & brown)	None	09-05-08

043A	211	Second Floor	Above Tbar ceiling	Adhesive	ceiling tile (brown)	None	08-05-27
043A	216	Second Floor	Classroom south east corner of ceiling	Adhesive	ceiling tile brown hard	None	12-06-06
043A	010	Basement	Fan room south wall, west corner	Caulking	grey/brown	Chrysotile	06-01-11
043A	024	Basement	Fan room middle of south wall	Caulking	Silver	Chrysotile	06-01-11
043A	012A	Basement	Library workroom ceiling	Ceiling tile	2x4 pinhole fiberglass	None	04-06-19
043A	106	Ground Floor	Staffroom ceiling	Ceiling tile	2x4 pinhole/fissured	None	04-06-19
043A	011	Basement	Corridor to library and gym	Drywall	Taping compund	None	06-01-11
043A	012	Basement	Library north wall outside workroom 012A	Drywall	Taping compund	Chrysotile	10-12-03
043A	012A	Basement	Library workroom east wall (less than 1%)	Drywall	Taping compund	Chrysotile	06-01-11
043A	017	Basement	East door, on inside surface, bottom area	Drywall	Taping compund	None	06-04-13
043A	022A	Basement	Ceiling of kitchen	Drywall	Taping compund	None	10-08-16
043A	100	Ground Floor	Corridor middle of wall outside room 106	Drywall	Taping compund	Chrysotile	12-06-06
043A	106	Ground Floor	Staff room west end division wall	Drywall	Taping compund	None	09-07-16
043A	200	Second Floor	Corridor right top corner of door jamb near room 213	Drywall	Taping compund	Chrysotile	12-06-06
043A	210	Second Floor	Classroom left top corner around door jamb	Drywall	Taping compund	Chrysotile	12-06-06
043A	025	Boiler room	#2 boiler breeching	Exterior insulation	Mag	Removed	95-03-02
043A	025	Boiler room	Hot water tank exterior insulation	Exterior insulation		None	95-03-02
043A	101A	Ground Floor	General office store room	Floor tile	9x9 biege w flecks	Removed	01-06-28
043A	110	Ground Floor	A/V room	Floor tile	9x9 beige	Chrysotile	12-06-14
043A	197	Ground Floor	North landing	Floor tile	Asphault	Chrysotile	89-02-08
043A	200	Second Floor	Corridor North end of hallway	Floor tile	12x12 beige	None	10-12-03
043A	002	Basement	Lino near sink	Flooring	Lino	None	89-02-28
043A	026	Basement	Girl's washroom window putty on exterior of window	Glazing putty	window	Chrysotile	02-01-04
043A	100	Ground Floor	Above south exit doors, window	Glazing putty		Tremolite	09-03-11
043A	025	Boiler room	Boiler #1 - material on very top of boiler drum	Insul. Cement	Grey	Removed	96-03-29
043A	025	Boiler room	Boiler #1 - exterior of front arch near burner hole area	Insul. Cement	Grey	Removed	95-03-29
043A	025	Boiler room	Boiler # 2 rear outer rim	Insul.	Grey	None	02-03-21

043A	024	Basement	Fan room 3 ft level of west wall	Cement Insul. Paper		None	06-01-11
043A	025	Boiler room	Bottom of breeching at incinerator	Insulation	Breeching	Removed	94-06-03
043A		Attic	Attic	Insulation		None	87-07-22
043A		Exterior	Outside multi purpose room 009 (East) under paint	Mastic	Black	Chrysotile	12-06-11
043A		Exterior	Outside boiler room 025 (West) under paint	Mastic	Black	Chrysotile	12 -06 -11
043A	025	Boiler room	Inside incinerator	Mortar		Removed	94-06-03
043A	025	Boiler room	Boiler #1 - outside boiler N/E wall	Mortar		Removed	95-04-03
043A	025	Boiler room	Boiler #1 - outside boiler S/E wall	Mortar		Removed	95-04-03
043A	025	Boiler room	Incinerator, right side	Mortar		Removed	94-06-03
043A	025	Boiler room	Boiler #1 - inside boiler S/E wall	Mortar		Removed	95-04-03
043A	025	Boiler room	Incinerator, left side	Mortar		Removed	94-06-03
043A	025	Boiler room	Boiler #1 - Inside boiler n/w wall	Mortar		Removed	95-04-03
043A	025	Boiler room	Boiler #1 - Inside boiler n/e wall	Mortar		Removed	95-04-03
043A	025	Boiler room	Boiler #1 - Inside boiler south wall	Mortar		Removed	95-04-03
043A	025	Boiler room	Boiler #1 - Inside boiler s/w wall	Mortar		Removed	95-04-03
043A	025	Boiler room	Boiler #1 - Outside boiler on top of bricks, near front end	Mortar		Removed	95-04-07
043A	025	Boiler room	Boiler #1 - outside boiler s/e wall between bricks	Mortar		Removed	95-04-07
043A	025	Boiler room	Boiler #1 - outside boiler n/e wall between bricks	Mortar		Removed	95-04-07
043A	025	Boiler room	Boiler #1 - Inside boiler north wall	Mortar		Removed	95-04-03
043A		Attic	South side of chimney	Mortar	Chimney mortar	Removed	95-05-05
043A	025	Boiler room	Above boiler	Pipe ells	Heating elbows	Removed	95-03-02
043A	025	Boiler room	From pipe near domestic hot water tank	Pipe ells	Plumbing ells	Removed	95-03-02
043A	010	Basement	Main fan room	Pipe insulation	Heating	Removed	87-07-22
043A	001	Basement	Classroom east wall top coat on cement	Plaster	Interior	None	July 07 2017
043A	001	Basement	Classroom ceiling	Plaster	Interior	None	July 07 2017
043A	001	Basement	Classroom ceiling beam, most east beam	Plaster	Interior	None	July 07 2017
043A	001	Basement	Classroom south wall, east side of door	Plaster	Interior	None	Aug 14 2017
043A	004	Basement	South side of ceiling	Plaster	Interior	None	12-06-05
043A	024	Basement	Fan room 3 ft level of west wall	Plaster	Refractory like material	None	06-01-11
043A	105	Classroom	Classroom north wall	Plaster	Interior	None	10-12-03
043A	211	Second Floor	West wall	Plaster	Interior	None	08-05-27

043A	212B	Second Floor	East wall	Plaster	Interior	None	08-05-27
043A	298	Second Floor	S/W exit near door	Plaster	Interior	None	91-12-16
043A	002	Basement	Wall near fire exit	Plaster	Interior	None	91-12-16
043A	002	Basement	S/E wall	Plaster	Interior	None	91-12-16
043A	009	Basement	N/E wall near exit	Plaster	Interior	None	91-12-16
043A	009	Basement	Lunch room, north wall	Plaster	Interior	None	90-11-21
043A	100	Ground Floor	Corridor, south exit wall near door	Plaster	Interior	None	91-12-16
043A	100	Ground Floor	Corridor East wall outside room 103	Plaster	Interior	None	Jan 31 2017
043A	100	Ground Floor	Corridor West wall outside room 106	Plaster	Interior	None	Jan 31 2017
043A	103	Ground Floor	Classroom south west corner of ceiling	Plaster	Interior	None	12-06-06
043A	104	Ground Floor	Classroom, northeast corner by cloakroom under light switch	Plaster	Interior	None	14-12-03
043A	104A	Ground Floor	cloakroom north wall	Plaster	Interior	None	Apr 27 2017
043A	200	Second Floor	Corridor, west wall	Plaster	Interior	None	91-12-16
043A	200	Second Floor	Corridor inside ceiling space (Plaster coat on cement)	Plaster	Interior	None	10-12-03
043A	200	Second Floor	Hallway main east wall	Plaster	Interior	None	91-12-16
043A	211	Second Floor	Wall outside	Plaster	Interior	None	91-12-16
043A	212	Second Floor	North wall near door	Plaster	Interior	None	91-12-16
043A	025	Boiler room	South wall on bricks	Plaster / cement	Texture on brick work	None	06-01-11
043A	025	Boiler room	Boiler #1 mortar between bricks of left wall beside target wall	Refractory	Boiler interior	Removed	96-03-29
043A	025	Boiler room	Incinerator, liner inside breeching	Refractory		Removed	94-06-03
043A	025	Boiler room	Boirler #1 - front door near burner	Refractory		Removed	94-06-10
043A	025	Boiler room	Boiler #2 - Front door upper part	Refractory		Removed	94-06-10
043A	025	Boiler room	Boiler #2 - Front inside bottom half	Refractory		Removed	94-06-10
043A	025	Boiler room	Boiler #2 - back door bottom half	Refractory		Removed	94-06-10
043A	025	Boiler room	Boiler #2 - back door inside shell	Refractory		Removed	94-06-10
043A	025	Boiler room	Boiler #2 - refractory, front burner.	Refractory		Removed	95-03-02
043A	025	Boiler room	Boiler #1 - liner between metal exterior plate & front	Refractory		Removed	95-03-02
043A	025	Boiler room	Boiler #1 - under floor in front of burner	Refractory		Removed	95-03-29
043A	025	Boiler room	Boiler #1 - behind 3' high first wall of bricks - on right side	Refractory		Removed	95-03-29
043A	025	Boiler room	Boiler #1 - behind 3' high first wall of bricks - on left side	Refractory		Removed	95-03-29
043A	025	Boiler room	Boiler #1 - From top section of back support collum	Refractory		Removed	95-03-29

043A	025	Boiler room	Boiler #1 - Material on back wall - behind boiler drum	Refractory		Removed	95-03-29
043A	025	Boiler room	Boiler #1 - Material between arch at front of boiler & the boiler drum	Refractory		Removed	95-03-29
043A	025	Boiler room	Boiler #2, back door top half	Refractory		Removed	94-06-10
043A	025	Boiler room	Boiler # 2 front door top	Refractory		Removed	02-03-21
043A	025	Boiler room	Boiler # 2 Front door middle	Refractory		Removed	02-03-21
043A	025	Boiler room	Boiler # 2 Front door bottom	Refractory		Removed	02-03-21
043A	025	Boiler room	Boiler # 2 Front bottom rim	Refractory		Removed	02-03-21
043A	025	Boiler room	Boiler # 2 Front center core	Refractory		Removed	02-03-21
043A	025	Boiler room	Boiler # 2 rear door top	Refractory		Removed	02-03-21
043A	025	Boiler room	Boiler # 2 rear door middle/bottom	Refractory		Removed	02-03-21
043A	025	Boiler room	Boiler # 2 rear bottom rim	Refractory		Removed	02-03-21
043A	020	Gymnasium	Gymnasium 020 roof	Roofing materials	Black mastics and Black felts	None	10-04-01
043A			Main roof	Roofing materials	Black mastics and Black felts	None	10-04-01
043B	101	Ground Floor	East wall behind donna conna tack board ceiling tile type glue	Adhesive	Ceiling tile (brown brittle)	None	09-05-21
043B	101B	Ground Floor	Washroom, behind toilet	Floor tile	9x9 red	Chrysotile	05-05-26
043B	101B	Ground Floor	Washroom, behind toilet	Mastic	under tile	None	05-05-26
043B		Ground Floor	Behind green board on east wall	Paper	Printed paper	None	09-05-28

APPENDIX C

Lead Paint Bulk Sample and Leachability Results

Maxxam
A Bureau Veritas Group Company

Success Through Science

Your Project #: 3141-2794
Site Location: VSB LIVINGSTONE ELEMENTARY SCHOOL
Your C.O.C. #: 08460321, 08460317

Attention: Brian Saarela

ACM Environmental
217 - 2323 Quebec St
Vancouver, BC
Canada V5T 4S7

Report Date: 2018/11/16
Report #: R2651516
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B899646
Received: 2018/11/13, 14:50

Sample Matrix: PAINT
Samples Received: 17

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements by ICP-AES (acid extr. solid)	12	2018/11/15	2018/11/15	BBY7SOP-00018	EPA 6010c R3 m
Elements by ICP-AES (acid extr. solid)	5	2018/11/15	2018/11/16	BBY7SOP-00018	EPA 6010c R3 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
This Certificate shall not be reproduced except in full, without the written approval of the laboratory.
Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam
A Bureau Veritas Group Company

Sciences Through Science

Your Project #: 3141-2794
Site Location: VSB LIVINGSTONE ELEMENTARY SCHOOL
Your C.O.C. #: 08460321, 08460317

Attention: Brian Saarela

ACM Environmental
217 - 2323 Quebec St
Vancouver, BC
Canada V5T 4S7

Report Date: 2018/11/16
Report #: R2651516
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B899646
Received: 2018/11/13, 14:50

Encryption Key

Maxxam
16 Nov 2018 11:00:18

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Nahed Amer, Project Manager
Email: NAmer@maxxam.ca
Phone# (604) 734 7276

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Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

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Success Through Science®

Maxxam Job #: B899646
Report Date: 2018/11/16

ACM Environmental
Client Project #: 3141-2794
Site Location: VSB LIVINGSTONE ELEMENTARY SCHOOL

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		UT5919	UT5920	UT5921	UT5922		
Sampling Date		2018/11/09	2018/11/09	2018/11/09	2018/11/09		
COC Number		08460321	08460321	08460321	08460321		
	UNITS	LP1 - BOILER ROOM CEILING - YELLOW PAINT ON CONCRETE	LP2 - BOILER ROOM FLOOR - GREY PAINT ON CONCRETE	LP3 - GYMNASIUM SOUTH WALL - INTERIOR YELLOW PAINT ON CONCRETE / PLASTER	LP4 - STAIR 099 - INTERIOR WHITE PAINT ON PLASTER	RDL	QC Batch
Total Metals by ICP							
Total Lead (Pb)	mg/kg	783	647	1310	1790	2.0	9228319
RDL = Reportable Detection Limit							

Maxxam ID		UT5923		UT5924	UT5925	UT5926		
Sampling Date		2018/11/09		2018/11/09	2018/11/09	2018/11/09		
COC Number		08460321		08460321	08460321	08460321		
	UNITS	LP5 - CORRIDOR 005 - BROWN FLOOR COATING ON CONCRETE	RDL	LP6 - ROOM 103 - INTERIOR PINK PAINT ON PLASTER	LP7 - ROOM 104 - INTERIOR BLUE PAINT ON PLASTER	LP8 - KITCHEN - INTERIOR YELLOW PAINT ON DRYWALL	RDL	QC Batch
Total Metals by ICP								
Total Lead (Pb)	mg/kg	206 (1)	6.0	1720	707	959	2.0	9228319
RDL = Reportable Detection Limit								
(1) Detection limits raised due to insufficient sample volume.								

Maxxam ID		UT5927	UT5928	UT5939		UT5940		
Sampling Date		2018/11/09	2018/11/09	2018/11/09		2018/11/09		
COC Number		08460321	08460321	08460317		08460317		
	UNITS	LP9 - ROOM 214 - BLUE WINDOW SILL PAINT ON WOOD	LP10 - 2ND FLOOR CORRIDOR, INTERIOR YELLOW PAINT ON BLOCK	LP11 - GROUND FLOOR, ROOM 103 CLOAKROOM - INTERIOR WOOD TRIM PAINT	RDL	LP12 - GROUND FLOOR, COPY ROOM 111 - INTERIOR WINDOW TRIM PAINT	RDL	QC Batch
Total Metals by ICP								
Total Lead (Pb)	mg/kg	258	1110	1190	2.0	7490 (1)	4.0	9228319
RDL = Reportable Detection Limit								
(1) Detection limits raised due to insufficient sample volume.								

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Maxxam Job #: B899646
Report Date: 2018/11/16

ACM Environmental
Client Project #: 3141-2794
Site Location: VSB LIVINGSTONE ELEMENTARY SCHOOL

ELEMENTS BY ATOMIC SPECTROSCOPY (PAINT)

Maxxam ID		UT5941	UT5942		UT5943		
Sampling Date		2018/11/09	2018/11/09		2018/11/09		
COC Number		08460317	08460317		08460317		
	UNITS	LP13 - NORTHWEST EXTERIOR - GREY PAINT	LP14 - NORTHEAST EXTERIOR DOOR PAINT	RDL	LP15 - EAST SIDE PLAY AREA - EXTERIOR WHITE PAINT ON WOOD	RDL	QC Batch
Total Metals by ICP							
Total Lead (Pb)	mg/kg	2360	130	2.0	200 (1)	4.0	9228319

RDL = Reportable Detection Limit
(1) Detection limits raised due to insufficient sample volume.

Maxxam ID		UT5944	UT5945		
Sampling Date		2018/11/09	2018/11/09		
COC Number		08460317	08460317		
	UNITS	LP16 - SOUTH ENTRANCE - EXTERIOR BLUE PAINT ON METAL HANDRAIL	LP17 - DAYCARE BUILDING - EXTERIOR GREY PAINT ON WOOD	RDL	QC Batch
Total Metals by ICP					
Total Lead (Pb)	mg/kg	1080	2370	2.0	9228319

RDL = Reportable Detection Limit

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Maxxam Job #: B899646
Report Date: 2018/11/16

ACM Environmental
Client Project #: 3141-2794
Site Location: VSB LIVINGSTONE ELEMENTARY SCHOOL

GENERAL COMMENTS

Results relate only to the items tested.

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Report Date: 2018/11/16

QUALITY ASSURANCE REPORT

ACM Environmental
Client Project #: 3141-2794
Site Location: VSB LIVINGSTONE ELEMENTARY SCHOOL

			Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9228319	Total Lead (Pb)	2018/11/15	<2.0	mg/kg	1.7	40	101	70 - 130

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.
QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.
Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

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Maxxam Job #: B899646
Report Date: 2018/11/16

ACM Environmental
Client Project #: 3141-2794
Site Location: VSB LIVINGSTONE ELEMENTARY SCHOOL

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Andy Lu, Ph.D., P.Chem., Scientific Specialist

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VanCity 50
Nov13/18

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CHAIN OF CUSTODY RE

08460321

COC #:

Page 1 of 2

Invoice Information	
Company Name:	ACM Environmental Corporation
Address:	[illegible]
Phone:	[illegible]
Email:	[illegible]

Report Information (if differs from invoice)	
Company Name:	
Contact Name:	[illegible]
Email:	brian@acmenvironmental.com

Project Information (where applicable)	
Quotation #:	
P.O. #/ AFE#:	
Project #:	[illegible]
Site #:	[illegible] Elementary School
Sampled By:	[illegible]

Turnaround Time (TAT) Required: ☒ Regular TAT 5 days

Rush TAT (Surcharges will be applied): ☐ Same Day ☐ 2 Days ☐ 1 Day ☐ 3 Days

Date Required:

Rush Confirmation #:

Regulatory Criteria: ☐ BC CSR Soil ☐ BC CSR Water ☐ [illegible] ☐ Other (Specify) ☐ Drinking Water ☐ BC Water Quality

Special Instructions: ☐ Return Cooler ☐ Ship Sample Bottles (Please Specify)

#	Sample Identification	Date Sampled	Matrix	Analysis	# of Containers Submitted
1	LP1 - [illegible]	[illegible]	Paint	X	1
2	LP2 - [illegible]	[illegible]	Paint	X	1
3	LP3 - [illegible]	[illegible]	Paint	X	1
4	LP4 - [illegible]	[illegible]	Paint	X	1
5	LP5 - [illegible]	[illegible]	Paint	X	1
6	LP6 - [illegible]	[illegible]	Paint	X	1
7	LP7 - [illegible]	[illegible]	Paint	X	1
8	LP8 - [illegible]	[illegible]	Paint	X	1
9	LP9 - [illegible]	[illegible]	Paint	X	1
10	LP10 - [illegible]	[illegible]	Paint	X	1

Laboratory Use Only — Custody Seal Y/N: Present N, Intact N; Cooler Temperature: N/A

Relinquished by: (Signature/Print)	Date: (YYYY/MM/DD)	Time: (HH:MM)	Received by: (Signature/Print)	Date: (YYYY/MM/DD)	Time: (HH:MM)
[signature]	2018/11/13	10:38	[signature] BRITTANY [illegible]	2018/11/13	14:50

B899646_COC

1105

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CHAIN OF CUSTODY RE

08460317

[illegible]

COC #:

Page 2 of 2

Invoice Information		Report Information (if differs from invoice)		Project Information (where applicable)	
Company Name:	[illegible] Environmental Corporation	Company Name:		Quotation #:	
Contact Name:	[illegible]	Contact Name:	Brian [illegible]	P.O. #/ AFE#:	
Address:	[illegible] Street	Address:		Project #:	[illegible]
	Vancouver, BC PC [illegible]		PC	Site Location:	[illegible]
Phone:	[illegible]	Phone:		Site #:	[illegible] Elementary School
Email:	[illegible]	Email:	brian@[illegible].com	Sampled By:	[illegible]

Turnaround Time (TAT) Required

- [x] Regular TAT 5 days [illegible]
- Rush TAT (surcharges will be applied)
- [ ] Same Day
- [ ] 2 Days
- [ ] 1 Day
- [ ] 3 Days

Date Required:

Rush Confirmation #:

Regulatory Criteria		Special Instructions
[ ] [illegible]	[ ] [illegible]	[ ] [illegible]
[ ] CCME (Specify)	[ ] Other (Specify)	[ ] [illegible] (Please specify)
[ ] Drinking Water	[ ] [illegible]	

Analysis Requested

LABORATORY USE ONLY

CUSTODY SEAL Y / N Present	Intact	COOLER TEMPERATURES
N	N	N/ [illegible]

#	Sample Identification	Date Sampled (YYYY/MM/DD)	Time Sampled	Matrix	[illegible]	# of Containers Submitted
1	L711 - Ground Floor, Room [illegible] - [illegible]	2018/11/09	N/A	Paint	X	1
2	L712 - Ground Floor, [illegible]	2018/11/09	N/A	Paint	X	1
3	L713 - [illegible]	2018/11/09	N/A	Paint	X	1
4	L714 - [illegible]	2018/11/09	N/A	Paint	X	1
5	L715 - [illegible]	2018/11/09	N/A	Paint	X	1
6	L716 - [illegible]	2018/11/09	N/A	Paint	X	1
7	L717 - [illegible]	2018/11/09	N/A	Paint	X	1
8						
9						
10						

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
[illegible] / [illegible]	2018/11/13	10:39	[illegible] BETHANY BORGOSE	2018/11/13	14:50

BB99646_COC

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Success Through Science

Your Project #: 3141-2794
Your C.O.C. #: 08462630

Attention: Tony Lai
ACM Environmental
217 - 2323 Quebec St
Vancouver, BC
Canada V5T 4S7

Report Date: 2018/11/27
Report #: R2656760
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8A3686
Received: 2018/11/27, 08:00

Sample Matrix: Solid
Samples Received: 7

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Elements by ICP-AES (acid extr. solid)	7	2018/11/27	2018/11/27	BBY7SOP-00018	EPA 6010c R3 m

Remarks:

Maxxam Analytics' laboratories are accredited to ISO/IEC 17025:2005 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Maxxam are based upon recognized Provincial, Federal or US method compendia such as CCME, MDDELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

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Your Project #: 3141-2794
Your C.O.C. #: 08462630

Attention: Tony Lai

ACM Environmental
217 - 2323 Quebec St
Vancouver, BC
Canada V5T 4S7

Report Date: 2018/11/27
Report #: R2656760
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8A3686
Received: 2018/11/27, 08:00

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27 Nov 2018 16:01:33

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Nahed Amer, Project Manager
Email: NAmer@maxxam.ca
Phone# (604) 734 7276

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Maxxam Job #: B8A3686
Report Date: 2018/11/27

ACM Environmental
Client Project #: 3141-2794
Sampler Initials: TL

ELEMENTS BY ATOMIC SPECTROSCOPY (SOLID)

Maxxam ID		UV7423	UV7424		UV7425		
Sampling Date		2018/11/26	2018/11/26		2018/11/26		
COC Number		08462630	08462630		08462630		
	UNITS	"B" BUILDING-EXTERIOR GREY PAINT ON WOOD SIDING	"B" BUILDING-BEIGE WOOD TRIM PAINT	RDL	"B" BUILDING-BEIGE DRYWALL PAINT	RDL	QC Batch
Total Metals by ICP							
Total Lead (Pb)	mg/kg	11300 (1)	10400 (1)	4.0	<6.0 (1)	6.0	9243356

RDL = Reportable Detection Limit
(1) Detection limits raised due to insufficient sample volume.

Maxxam ID		UV7426		UV7427		UV7428		
Sampling Date		2018/11/26		2018/11/26		2018/11/26		
COC Number		08462630		08462630		08462630		
	UNITS	"B" BUILDING-BEIGE PAINT ON WOOD FIBREBOARD	RDL	"B" BUILDING-WHITE WOOD TRIM PAINT	RDL	POTABLE-EXTERIOR BROWN PAINT ON WOOD SIDING	RDL	QC Batch
Total Metals by ICP								
Total Lead (Pb)	mg/kg	3140	2.0	29600 (1)	20	3.6	2.0	9243356

RDL = Reportable Detection Limit
(1) Detection limits raised due to dilution to bring analyte within the calibrated range.

Maxxam ID		UV7429		
Sampling Date		2018/11/26		
COC Number		08462630		
	UNITS	POTABLE-BEIGE DRYWALL PAINT	RDL	QC Batch
Total Metals by ICP				
Total Lead (Pb)	mg/kg	3.6	2.0	9243356

RDL = Reportable Detection Limit

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Maxxam Job #: B8A3686
Report Date: 2018/11/27

ACM Environmental
Client Project #: 3141-2794
Sampler Initials: TL

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B8A3686
Report Date: 2018/11/27

QUALITY ASSURANCE REPORT

ACM Environmental
Client Project #: 3141-2794
Sampler Initials: TL

			Method Blank		RPD		QC Standard	
QC Batch	Parameter	Date	Value	UNITS	Value (%)	QC Limits	% Recovery	QC Limits
9243356	Total Lead (Pb)	2018/11/27	<2.0	mg/kg	4.1 (1)	40	94	70 - 130

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

QC Standard: A sample of known concentration prepared by an external agency under stringent conditions. Used as an independent check of method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

(1) Detection limits raised due to insufficient sample volume.

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Maxxam Job #: B8A3686
Report Date: 2018/11/27

ACM Environmental
Client Project #: 3141-2794
Sampler Initials: TL

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Andy Lu, Ph.D., P.Chem., Scientific Specialist

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CHAIN OF CUSTODY R

COC # 08462630

BBY FCD-00073/05

Page 1 of 3

Invoice Information	Report Information (if different from invoice)	Project Information (where applicable)	Turnaround Time (TAT) Required
Company Name: AGM Environmental Corporation	Company Name:	Quotation #:	☐ Regular TAT 5 days (Weekdays)
Contact Name: Rosemary Fox-Johnson	Contact Name: Tony Lo	P.O. #/ AFE#:	PLEASE PROVIDE ADVANCE NOTICE FOR RUSH PROJECTS
Address: 217 - 2325 Quebec Street	Address:	Project #: 3141-2754	Rush TAT (Surcharges will be applied)
Vancouver, BC PC: V5T 4S3	PC:	Site Location:	☐ Same Day ☐ 2 Days
Phone: 604-873-8590	Phone: 604-562-3926	Site #:	☑ 1 Day ☐ 3 Days
Email: rfoxjohnson@agmenvironmental.com	Email: tony@agmenvironmental.com	Sampled By: Tony Lo	Date Required: Before Noon, Nov 28, 2018

Regulatory Criteria	Special Instructions	Rush Confirmation #:
☐ BC CSR Soil ☐ BC CSR Water	☐ Return Cooler	LABORATORY USE ONLY
☐ CCME (Specify) ☐ Other (Specify)	☐ Hold Sample Bottles (Please Specify)	CUSTODY SEAL Y / N: Present / Intact
☐ Drinking Water ☐ BC Water Quality		COOLER TEMPERATURES: N / N
		N/A
		WORKING MEDIA FREEZE Y / N
		COMMENTS

	Sample Identification	Lab Identification	Date Sampled (YYYY/MM/DD)	Time Sampled (HH:MM)	Matrix	Analysis Requested	# OF CONTAINERS SUBMITTED
1	"B" Building - Exterior Grey Paint on Wood Siding		2018/11/26		Solid	X	1
2	"B" Building - Beige Wood Trim Paint		2018/11/29		Solid	X	1
3	"B" Building - Beige Drywall Paint		2018/11/26		Solid	X	1
4	"B" Building - Beige Paint on Wood Northwest		2018/11/26		Solid	X	1
5	"B" Building - White Wood Trim Paint		2018/11/26		Solid	X	1
6	Possible - Exterior Brown Paint on Wood Siding		2018/11/29		Solid	X	1
7	Possible - Beige Drywall Paint		2018/11/26		Solid	X	1
8							
9							
10							

RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
Tony Lo	2018/11/27	800	BRITTANY PURLONE	2018/11/27	08:00

MAXXAM_CA

202

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Your Project #: 3141-2794
Site Location: LIVINGSTONE ELEMENTARY SCHOOL
Your C.O.C. #: 08462771

Attention: Callum Armour
ACM Environmental
217 - 2323 Quebec St
Vancouver, BC
Canada V5T 4S7

Report Date: 2018/12/18
Report #: R2665787
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8A8388
Received: 2018/12/12, 11:20

Sample Matrix: Bulk
Samples Received: 2

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
ICP-AES Metals in TCLP Leachate	2	2018/12/17	2018/12/18	BBY7SOP-00018	EPA 6010c R3 m
TCLP pH Measurements	1	N/A	2018/12/18	BBY7SOP-00005	EPA 1311
TCLP pH Measurements (<100g sample used)	1	N/A	2018/12/18	BBY7SOP-00020	EPA 1311 R1992 m

Remarks:

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All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Maxxam's profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Maxxam in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Maxxam Analytics' liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Maxxam has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Maxxam, unless otherwise agreed in writing. Maxxam is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Maxxam, results relate to the supplied samples tested.
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Reference Method suffix "m" indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

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Maxxam
10 Dec 2018 15:43:13

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Nahed Amer, Project Manager
Email: NAmer@maxxam.ca
Phone# (604) 734 7276

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Your Project #: 3141-2794
Site Location: LIVINGSTONE ELEMENTARY SCHOOL
Your C.O.C. #: 08462771

Attention: Callum Armour

ACM Environmental
217 - 2323 Quebec St
Vancouver, BC
Canada V5T 4S7

Report Date: 2018/12/18
Report #: R2665787
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B8A8388
Received: 2018/12/12, 11:20

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Maxxam Job #: B8A8388
Report Date: 2018/12/18

ACM Environmental
Client Project #: 3141-2794
Site Location: LIVINGSTONE ELEMENTARY SCHOOL
Sampler Initials: CA

ELEMENTS BY ATOMIC SPECTROSCOPY (BULK)

Maxxam ID		UY2428			UY2429		
Sampling Date		2018/12/11			2018/12/11		
COC Number		08462771			08462771		
	UNITS	MAIN SCHOOL-WHITE PAINT ON PLASTER	RDL	QC Batch	B BUILDING-BEIGE PAINT ON WOOD TRIM	RDL	QC Batch
TCLP Extraction Procedure							
Initial pH of Sample	pH	12.0	N/A	9268691	3.94	N/A	9268688
pH after HCl	pH	6.33	N/A	9268691			
Final pH of Leachate	pH	6.79	N/A	9268691	4.93	N/A	9268688
pH of Leaching Fluid	pH	2.84	N/A	9268691	4.93	N/A	9268688
Metals							
LEACHATE Lead (Pb)	mg/L	1.08	0.30	9269784	2.12	0.30	9269784

RDL = Reportable Detection Limit
N/A = Not Applicable

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

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Success Through Science

Maxxam Job #: B8A8388
Report Date: 2018/12/18

ACM Environmental
Client Project #: 3141-2794
Site Location: LIVINGSTONE ELEMENTARY SCHOOL
Sampler Initials: CA

GENERAL COMMENTS

Results relate only to the items tested.

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Maxxam Job #: B8A8388
Report Date: 2018/12/18

QUALITY ASSURANCE REPORT

AOM Environmental
Client Project #: 3141-2794
Site Location: LIVINGSTONE ELEMENTARY SCHOOL
Sampler Initials: CA

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
9268688	Final pH of Leachate	2018/12/18					4.93	pH	0	N/A
9268688	Initial pH of Sample	2018/12/18					4.93	pH	0.51	N/A
9268688	pH of Leaching Fluid	2018/12/18					4.93	pH	0	N/A
9269784	LEACHATE Lead (Pb)	2018/12/18	NC	75 - 125	110	75 - 125	<0.50	mg/L	3.4	40

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spike amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than the native sample concentration)

Maxxam
A Bureau Veritas Group Company

Success Through Science

Maxxam Job #: B8A8388
Report Date: 2018/12/18

ACM Environmental
Client Project #: 3141-2794
Site Location: LIVINGSTONE ELEMENTARY SCHOOL
Sampler Initials: CA

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

Rob Reinert, B.Sc., Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Analytics International Corporation o/a Maxxam Analytics Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Maxxam

CHAIN OF CUSTODY RE

COC #: 08462771

Invoice Information		Report Information (if differs from invoice)		Project Information	
Company Name:	ACM Environmental Corporation	Company Name:	ACM Environmental Corporation	Quotation #:	
Contact Name:	[illegible]	Contact Name:	[illegible]	P.O. #/AFE#:	
Address:	[illegible] Street	Address:		Project #:	[illegible]
	Vancouver BC [illegible]		PC:	Site Location:	[illegible] Elementary School
Phone:	[illegible]	Phone:		Site #:	
Email:	admin@acmenvironmental.com	Email:	callum@acmenvironmental.com	Sampled By:	Callum

Laboratory Use Only — Custody Seal Y/N: Present N, Intact N; Cooler Temperatures: N/A

#	Sample Identification	Date Sampled	Matrix
1	[illegible]	2018 12 11	Solid
2	[illegible]	2018 12 11	Solid
3			
4			
5			
6			
7			
8			
9			
10			

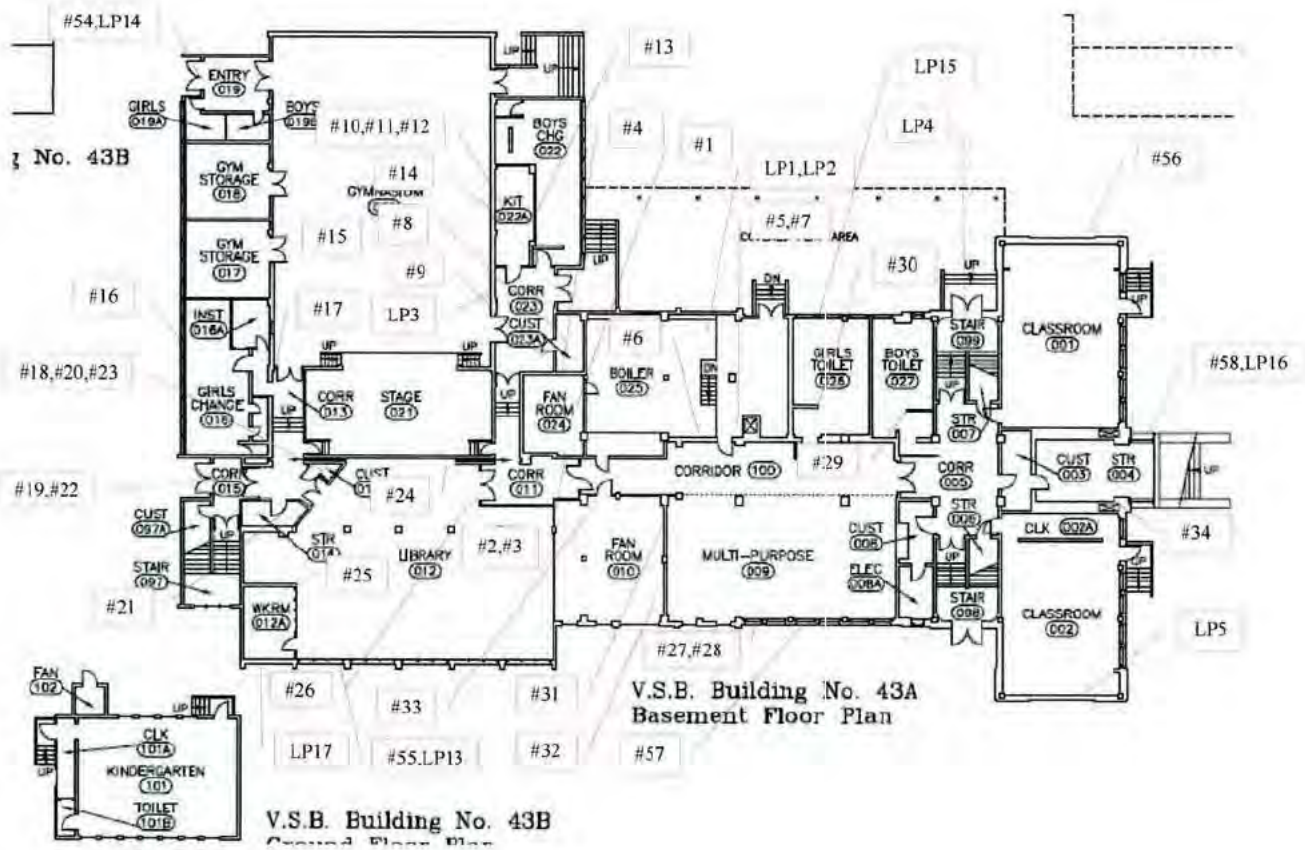
RELINQUISHED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)	RECEIVED BY: (Signature/Print)	DATE: (YYYY/MM/DD)	TIME: (HH:MM)
[signature]	[illegible]	8:45AM	[signature]	12/12/2018	8:50am
			BBK BRITTANY	2018/12/12	11:20

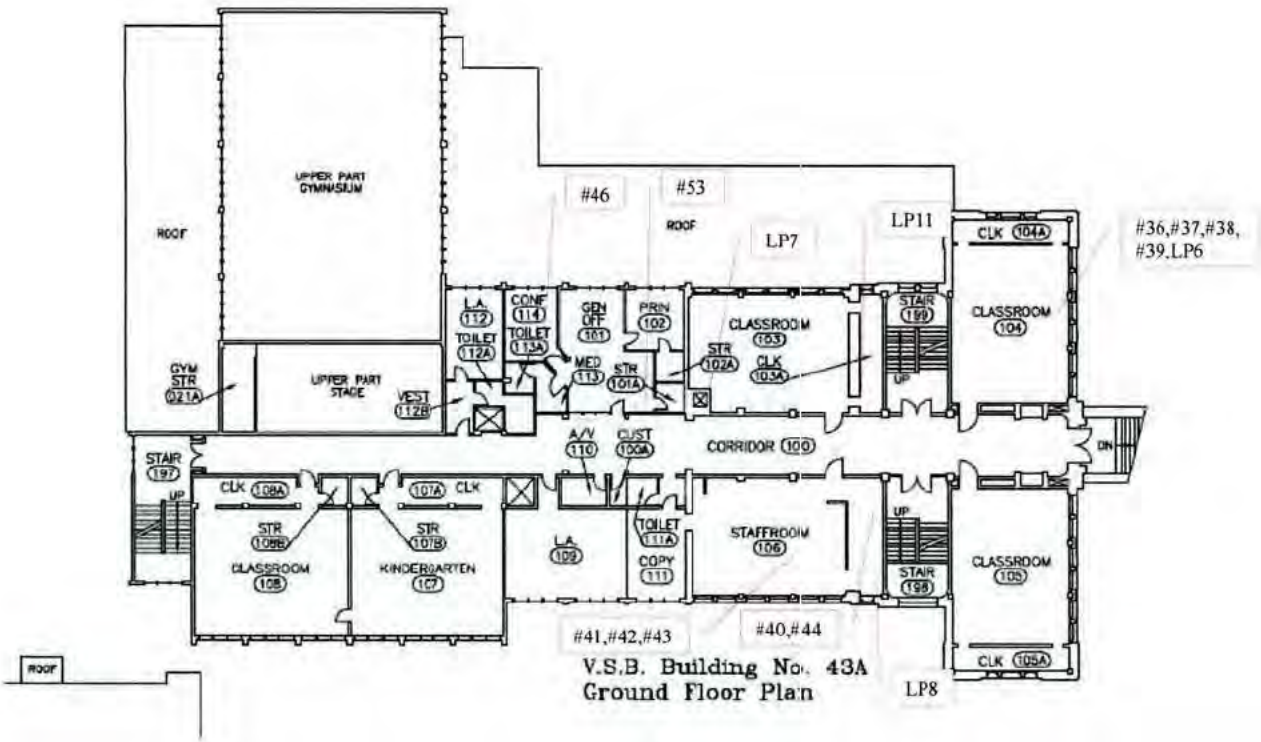
B8A8388_COC

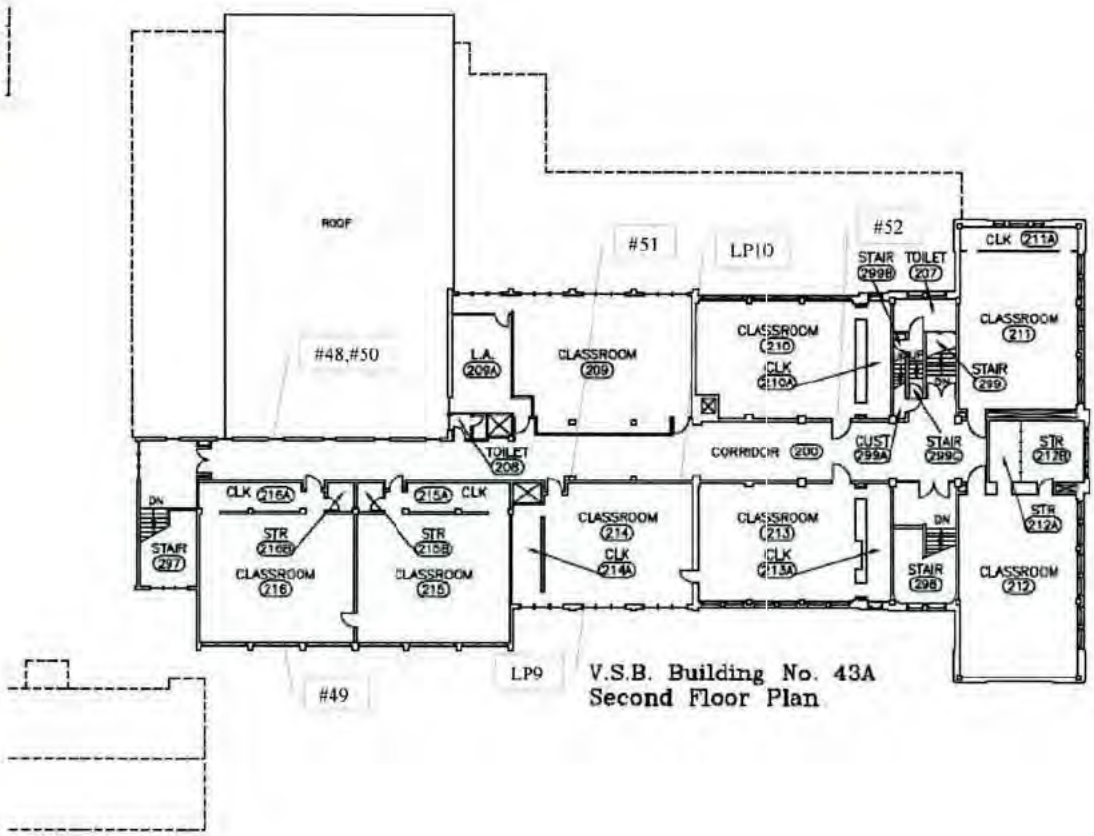
IDEZ

APPENDIX D

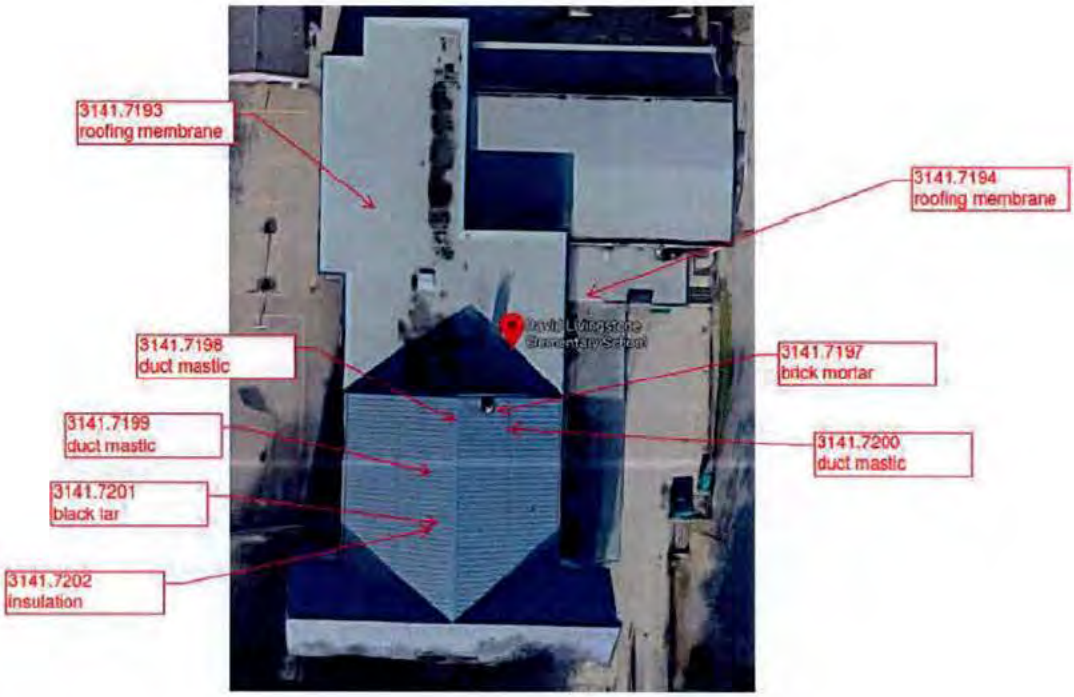
Sample Location Diagram

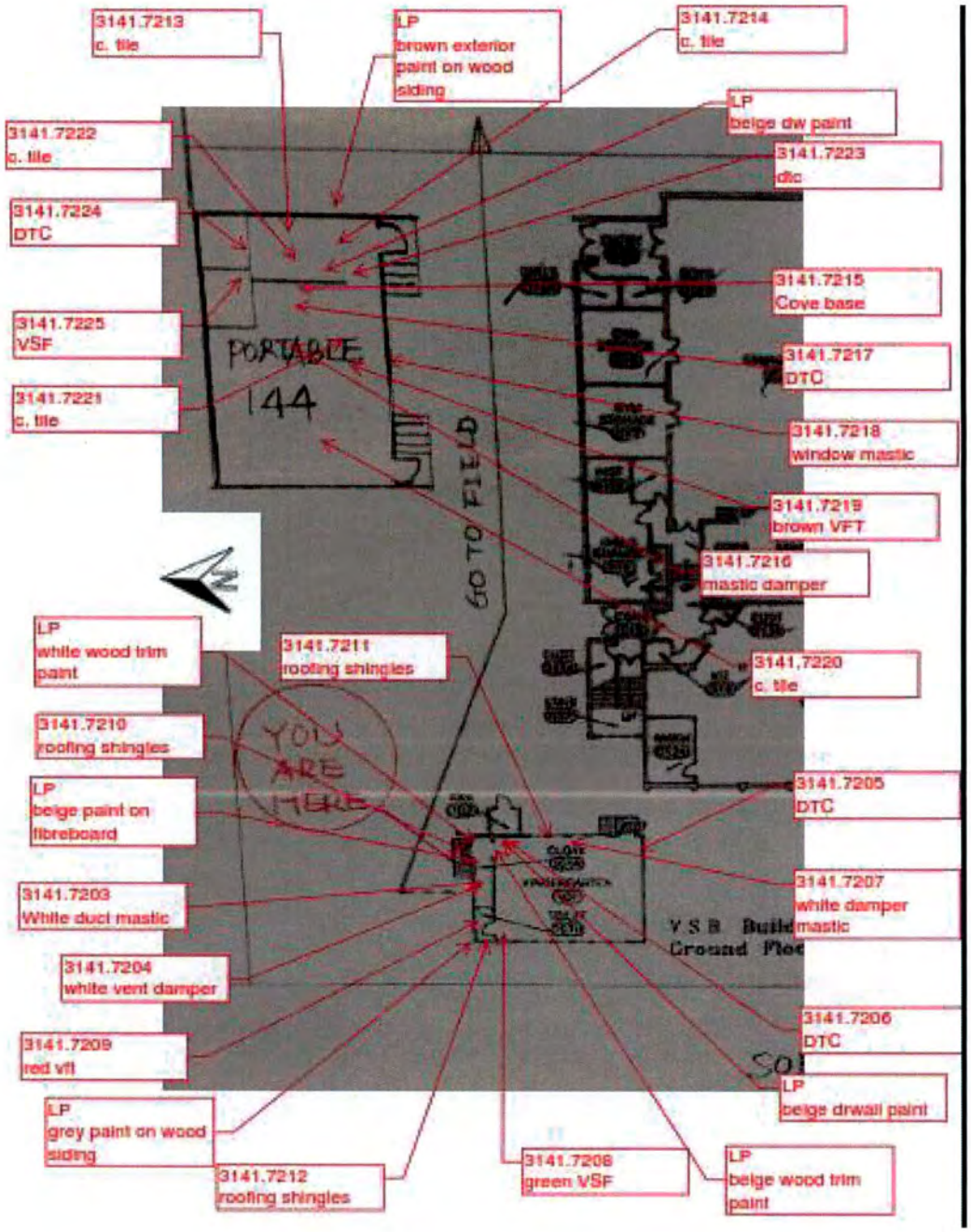

#54,LP14
No. 43B
ENTRY (019)
GIRLS (019A)
BOYS (019B)
#10,#11,#12
GYM STORAGE (018)
GYM STORAGE (017)
#14
GYMNASIUM
#15
#8
#9
#16
INST (016A)
#17
LP3
#18,#20,#23
GIRLS CHANGE (016)
CORR (013)
STAGE (021)
#19,#22
CORR (015)
CUST (014)
#24
CUST (097A)
STR (014)
STAIR (097)
#25
LIBRARY (012)
#2,#3
#21
WKRM (012A)
#26
#33
#31
LP17
#55,LP13
#32
#57
FAN (102)
CLK (101A)
KINDERGARTEN (101)
TOILET (101B)
V.S.B. Building No. 43B
#13
#4
#1
LP1,LP2
BOYS CHG (022)
KIT (022A)
CORR (023)
CUST (023A)
#6
BOILER (025)
FAN ROOM (024)
CORR (011)
FAN ROOM (010)
#27,#28
#5,#7
#30
LP15
LP4
#56
GIRLS TOILET (126)
BOYS TOILET (027)
STAIR (099)
CLASSROOM (001)
#58,LP16
CORRIDOR (100)
#29
STR (007)
CORR (005)
CUST (003)
STR (004)
#34
STR (006)
CLK (002A)
MULTI-PURPOSE (009)
CUST (008)
ELEC (008A)
STAIR (098)
CLASSROOM (002)
LP5
V.S.B. Building No. 43A
Basement Floor Plan


UPPER PART GYMNASIUM
ROOF
#46
#53
ROOF
LP7
LP11
#36,#37,#38, #39.LP6
CLK 104A
CLASSROOM 104
STAIR 199
UP
LA 112
CONF 114
TOILET 112A
TOILET 113A
GRN OFF 101
PRIN 102
MED 113
STR 101A
CLASSROOM 103
STR 102A
CLK 103A
GYM STR 021A
UPPER PART STAGE
VEST 112B
A/V 110
CUST 100A
CORRIDOR 100
DN
STAIR 197
UP
CLK 108A
107A CLK
STR 108B
CLASSROOM 108
STR 107B
KINDERGARTEN 107
LA 109
TOILET 111A
COPY 111
STAFFROOM 106
UP
STAIR 198
CLASSROOM 105
CLK 105A
#41,#42,#43
#40,#44
ROOF
V.S.B. Building No. 43A
Ground Floor Plan
LP8



V.S.B. Building No. 43A
Second Floor Plan

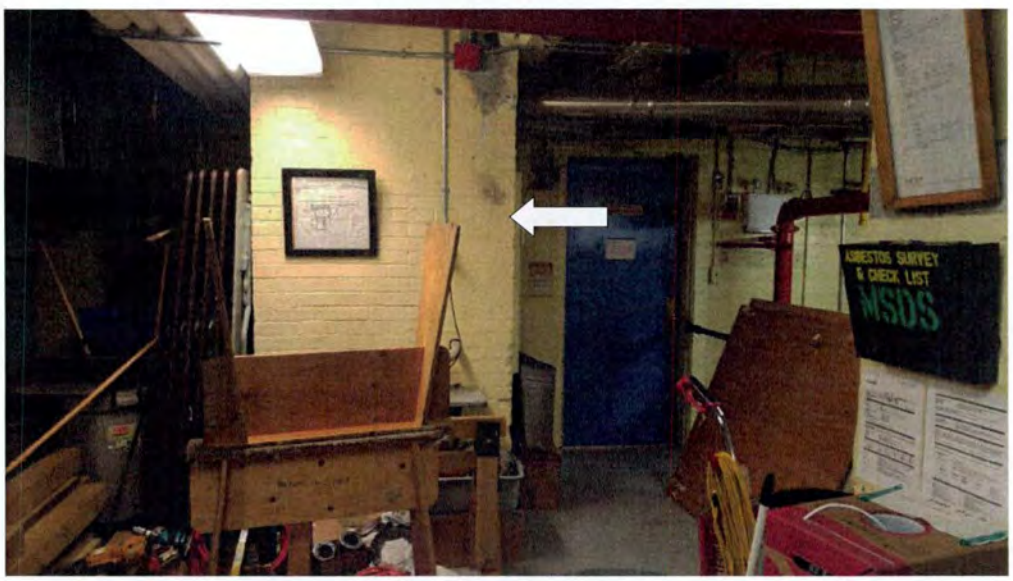

3141.7193
roofing membrane
3141.7194
roofing membrane
3141.7198
duct mastic
3141.7197
brick mortar
3141.7199
duct mastic
3141.7200
duct mastic
3141.7201
black tar
3141.7202
insulation


3141.7213
c. tile
LP
brown exterior
paint on wood
siding
3141.7214
c. tile
LP
beige dw paint
3141.7222
c. tile
3141.7223
dtc
3141.7224
DTC
3141.7215
Cove base
3141.7225
VSF
3141.7217
DTC
3141.7221
c. tile
3141.7218
window mastic
3141.7219
brown VFT
3141.7216
mastic damper
LP
white wood trim
paint
3141.7211
roofing shingles
3141.7220
c. tile
3141.7210
roofing shingles
LP
beige paint on
fibreboard
3141.7205
DTC
3141.7203
White duct mastic
3141.7207
white damper
mastic
3141.7204
white vent damper
3141.7206
DTC
3141.7209
red vfl
LP
beige drwall paint
LP
grey paint on wood
siding
3141.7208
green VSF
LP
beige wood trim
paint
3141.7212
roofing shingles
PORTABLE
144
GO TO FIELD
YOU
ARE
HERE
N
VSB Build
Ground Floo

APPENDIX E

Site Photographs

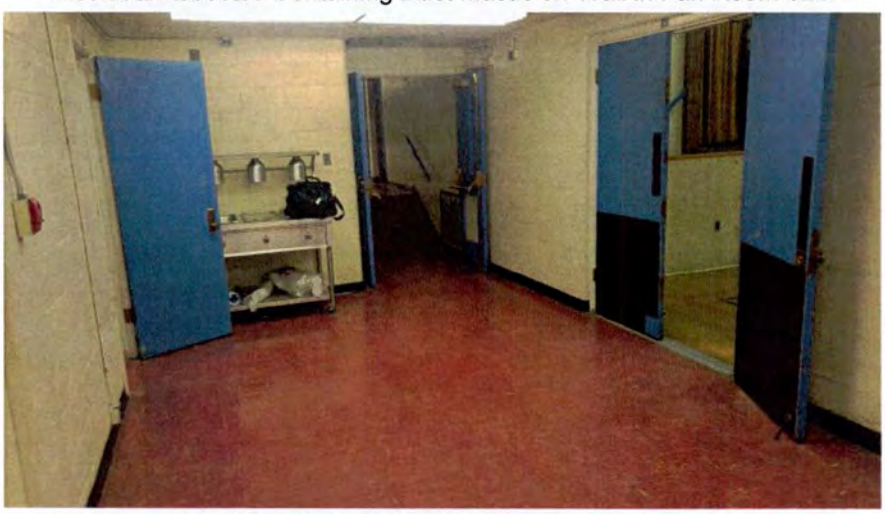
Asbestos Containing Drywall and Vinyl Floor Tiles (under carpet) in Library



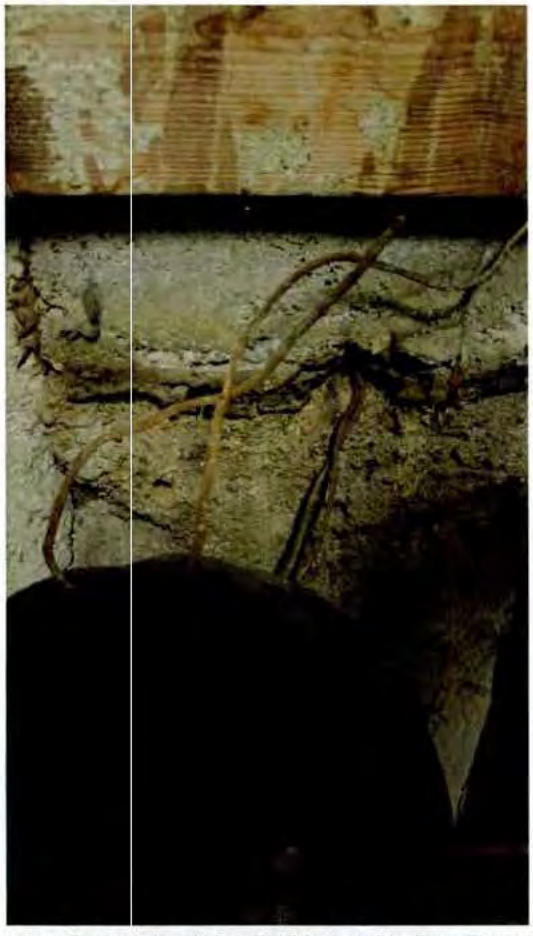
Boiler Room with Asbestos Containing Concrete Skim Coat on Walls & Chimney

Peeling Lead Paint on Boiler Room Ceiling

Residual Asbestos Containing Duct Mastic on Wall in Fan Room 024



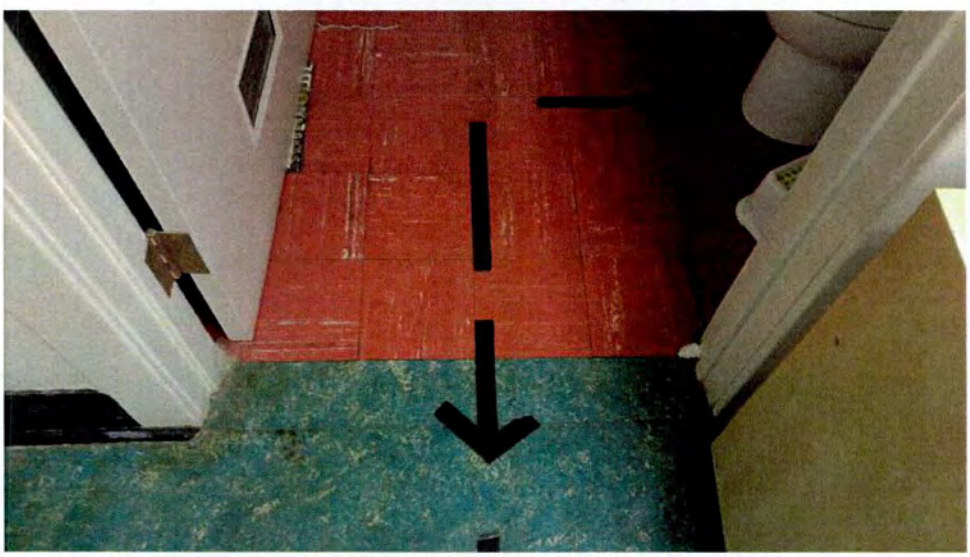
Corridor 023 – 9" Asbestos Red Vinyl Floor Tiles



Asbestos Containing Wall Fill Material in Fan Room 024

Assumed Asbestos Containing Fire Door Label

Assumed Asbestos Containing Bells & Spigots on Drain Lines



Asbestos Containing Red 9" Vinyl Floor Tiles in Daycare Building Washroom