ALL-TECH
ENVIRONMENTAL SERVICES LIMITED
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TEM Sampling Report

December 9th, 2022

Cody Field
Greytop Commercial Construction inc.
10 Frazee Avenue
Dartmouth, Nova Scotia
B3B 1X4

Project #: 30128

Microvac Sampling Results - Asbestos in Settled Dust
Bicentennial School, 85 Victoria Road, Dartmouth, Nova Scotia

On November 28th, 2022, ALL-TECH Environmental Services Ltd. collected five (5) TEM Dust Microvac samples of settled dust for asbestos analyses while on site at Bicentennial School located at 85 Victoria Road in Dartmouth, Nova Scotia. The TEM samples were collected from horizontal surfaces throughout the northwest wing to establish background levels prior to exterior demolition activities.

The Microvac samples were submitted to International Asbestos Testing Laboratories (IATL) Laboratories in Mount Laurel, NJ for asbestos analyses. IATL is an internationally accredited laboratory with NIST-NVLAP, AIHA, and the New York Department of Health (NY-DOH).

What is Asbestos?

Asbestos is a generic term which is used to describe a group of naturally occurring fibrous mineral silicates (fibrous rock). Six main types of asbestos are; chrysotile, amosite, crocidolite, anthophyllite, tremolite, and actinolite. Heat, corrosion, and tensile qualities of Asbestos have been so beneficial, that from the dates 1900 to 1980, Asbestos was used worldwide in over 3000 different commercial products. Asbestos has been used in fireproofing materials, friction products, reinforcing building materials, insulations materials (thermal/acoustic), etc.

Microvac Dust Sample Results

Samples were collected on a 25mm Settled Dust Sampling cassette loaded with a 0.8 µm MCE filter. The sampling pump used to collect the sample were Gilian® low volume air sampling pumps. Prior to sampling, the pump was calibrated using a TSI® Primary Calibrator Model #4146, Serial No. 41461602006 (NIST Traceable). The samples were analysed by IATL for asbestos content following the ASTM D5755-09 Standard Test Method for Microvacuum Sampling and Indirect Analysis of Settled Dust by TEM for Asbestos. The results of the analyses are presented in Table 1.0.

Table 1.0
Microvac Analyses of Settled Dust Samples
Bicentennial School
November 28th, 2022

Sample #	Item Sampled	Structures (s/cm^2)	Asbestos Types Detected
T-01 *(Lab # 7533054)*	Room 10 - Desk	370	**Chrysotile**
T-02 *(Lab # 7533055)*	Room 10 - Chalkboard	< 370	**None Detected**
T-03 *(Lab # 7533056)*	Room 9 – Teacher's Desk	12,000	**Chrysotile**

Sample #	Item Sampled	Structures (s/cm^2)	Asbestos Types Detected
T-04 *(Lab # 7533057)*	Room 9 - Chalkboard	4,630	**Chrysotile**
T-05 *(Lab # 7533058)*	Teacher's Room – Center Desk	18,500	**Chrysotile**

TEM (Microvac) Dust Sampling Conclusion

In Canada, no Provincial or Federal guidelines with respect to settled dust sampling and analysis exist. However, in the U.S.A., a considerable number of settled dust analyses for asbestos using TEM have been performed following the Microvac sampling procedure[1]. Based on current available information, contrary to airborne asbestos, there are no regulated health-based exposure limits for surface asbestos fibres in structures. There is no clearly established correlation between airborne contaminant concentrations and analysis of dust sample.

Based on results from these studies, levels of asbestos in settled dust as determined by the Microvac technique are considered low (levels expected outdoors) if less than 1,000 s/cm^2 (structures per cubic centimeter) are detected, above background (Moderate Contamination) if levels are greater than 10,000 s/cm^2, and high (significant contamination) if levels are above 100,000 s/cm^2. Levels above 100,000 s/cm^2 are usually associated with a significant accidental release such as from an asbestos abatement site. Based on the sampling results, Microvac sample number T-03 and T-05 collected show contamination (greater than 10,000 s/cm^2).

For the purpose of asbestos fibres in surface dust, < 5,000 s/cm^2 is generally used as an acceptable clearance concentration. [2]

It has been a pleasure providing this service to you. If you should have any questions regarding this report, please do not hesitate to call our office 902-835-3727 or email us email@toalltech.com.

Thank you and have a great day,

Alisha Glogowski, B.Sc.
Environmental Scientist
ALL-TECH Environmental Services Ltd.

1 Millette, J.R. and S.M. Hays, Settled Asbestos Dust Sampling and Analysis, Lewis Publishers, London, 1994, pp: 49-51
2 US EPA response to the Lower Manhattan test and clean up program following the collapse of the World Trade Center in 2001.

APPENDIX 1.0 – LABORATORY RESULTS

iATL INTERNATIONAL
ASBESTOS TESTING LABORATORIES

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

CERTIFICATE OF ANALYSIS

Client: ALL-TECH Environmental Services Limited
20 Duke St.,Suite 109
Bedford NS B4A 2Z5
Client: ALL131

Report Date: 12/7/2022
Report No.: 673591 - TEM Dust Microvac
Project: Bicentennial School
Project No.: 30128

TEM DUST SAMPLE ANALYSIS SUMMARY

Lab No.:7533054
Client No.:T-01
Asbestos Type(s):
Chrysotile
Area (cm²):100
Location: Room 10-Desk
Density (s/mm²):7.69
Concentration (s/cm²):370

Lab No.:7533055
Client No.:T-02
Asbestos Type(s):
None Detected
Area (cm²):100
Location: Room 10-Chaulkboard
Density (s/mm²):<7.69
Concentration (s/cm²):<370

Lab No.:7533056
Client No.:T-03
Asbestos Type(s):
Chrysotile
Area (cm²):100
Location: Room 9-Teachers Desk
Density (s/mm²):250
Concentration (s/cm²):12000

Lab No.:7533057
Client No.:T-04
Asbestos Type(s):
Chrysotile
Area (cm²):100
Location: Room 9-Chaulkboard
Density (s/mm²):96.2
Concentration (s/cm²):4630

Lab No.:7533058
Client No.:T-05
Asbestos Type(s):
Chrysotile
Area (cm²):100
Location: Teachers Room-Center Desk
Density (s/mm²):385
Concentration (s/cm²):18500

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

Date Received: 12/1/2022
Date Analyzed: 12/07/2022
Signature:
Analyst: Craig Liska

Approved By:
Frank E. Ehrenfeld, III
Laboratory Director

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Mt. Laurel, New Jersey 08054
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	20 Duke St.,Suite 109	Report No.:	673591 - TEM Dust Microvac
	Bedford NS B4A 2Z5	Project:	Bicentennial School
		Project No.:	30128
Client:	ALL131		

Appendix to Analytical Report:

Customer Contact:
Analysis: ASTM D5755-09

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

iATL Customer Service: customerservice@iatl.com
iATL Office Manager:wchampion@iatl.com
iATL Account Representative: Semih Kocahasan
Sample Login Notes: See Batch Sheet Attached
Sample Matrix: Cassettes
Exceptions Noted: See Following Pages

General Terms, Warrants, Limits, Qualifiers:

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

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

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

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

Information Pertinent to this Report:

Analysis by ASTM D5755-09

Please see our list of international, national, state, provincial, and local certifications at www.iatl.com

TEM settled dust results are dependent upon several factors, including sampling technique. iATL can supply references that may aid in the interpretation of results.

All results are based on the samples as received at the lab. iATL assumes that appropriate sampling methods have been used and that the data upon which these results are based have been accurately supplied by the client.

Method requires submittal of blanks for analysis. Sample results are not corrected for contamination by field or analytical blanks.

Disclaimers / Qualifiers:

There may be some samples in this project that have a "NOTE:" associated with a sample result. We use added disclaimers or qualifiers to inform the client about something that requires further explanation. Here is a complete list with highlighted disclaimers pertinent to this project. For a full explanation of these and other disclaimers, please inquire at customerservice@iatl.com.
(1)Note: Sample not analyzed.
(2)Note: Sample not analyzed at request of client.
(3)Note: Sample analysis terminated. Clearance criteria exceeded (average >70.0 s/mm^2). Set fails by AHERA 40 CFR 763.
(4)Note: Heavy loading (>0.1 s/cc) of non-asbestos particulate that might prohibit the required morphological, diffraction and elemental identification of asbestos. The absence of asbestos on the sample can not be concluded. Analysis for informational purposes only.
(5)Note: Heavy loading (>10% per grid opening) non-fibrous particulate. Sample analysis terminated. Clearance criteria exceeded (>10%). Sample voided by AHERA 40

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	20 Duke St.,Suite 109	Report No.:	673591 - TEM Dust Microvac
	Bedford NS B4A 2Z5	Project:	Bicentennial School
		Project No.:	30128
Client:	ALL131		

CFR 763.
(5A)Note: Heavy loading (>25% per grid opening) non-fibrous particulate. Sample analysis terminated. Clearance criteria exceeded (>25%). Sample voided by NIOSH 7402.
(6)Note: Sample turbidity >1.0 NTU. Therefore MDL >> 0.1 MFL. Does not meet National Primary Drinking Water Standards.
(7)Note: Sample integrity compromised. Received sample cassette with top open (40 CFR 763 c-e).
(8)Note: Received sample cassettes with portion of filter missing. "PCM re-prep"
(9)Note: Void - overloaded, unable to prep.
(10)Note: Void - filter damaged.
(11)Note: No volume supplied.
(12)Note: Heavy loading (>0.1 s/cc) of non-asbestos / non-fibrous particulate.
(13)Note: Method analytical sensitivity of <0.003 s/cc not attained due to volume of air sampled. NIOSH requires a minimum of 400L.
(13A)Note: Volume does not meet AHERA requirements.(<1188 L)
(14)Note: Geometric Mean = 0.xxxx Structures/cc
(15)Note: Samples received on 0.8 micron PCM filters. Samples must be submitted on 0.45 micron filter cassettes per AHERA guidelines
(18)Note: *Results are for informational purposes only. Samples received on 0.8um PCM cassettes. Per AHERA 40 CFR 763 guidelines samples must be obtained on a 0.45um cassette.

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Bedford NS B4A 2Z5
Client: ALL131

Report Date: 12/7/2022
Report No.: 673591 - TEM Dust Microvac
Project: Bicentennial School
Project No.: 30128

TEM DUST SAMPLE ANALYSIS DETAILS

Lab No.: 7533054
Client No.: T-01

Volume Filtered (mL): 10
Dilution Factor (mL): 50
Grid Openings: 10
Opening Area (mm²): 0.013
Area Analyzed (mm²): 0.130
Sensitivity (s/mm²): 7.69
Detection Limit (s/cm²): 370
Micrograph Number:
EDXA Spectrum ID:

Area Sampled (cm²): 100
Location: Room 10-Desk

Asbestos Structures: 1
Structures < 5 µm: None Detected
Structures ≥ 5 µm: 1
Structure Density (s/mm²): 7.69
Structure Concentration (s/cm²): 370
Asbestos Type(s):
Chrysotile

Filter Type: MCE
Filter Size (mm²): 962
Pore Size (µm): 0.45
Non-Asbestos Structures: None Detected
Structure Density (s/mm²): <7.69
Structure Concentration (s/cm²): <370
Non-Asbestos Type(s):
None Detected

Lab No.: 7533055
Client No.: T-02

Volume Filtered (mL): 10
Dilution Factor (mL): 50
Grid Openings: 10
Opening Area (mm²): 0.013
Area Analyzed (mm²): 0.130
Sensitivity (s/mm²): 7.69
Detection Limit (s/cm²): 370
Micrograph Number:
EDXA Spectrum ID:

Area Sampled (cm²): 100
Location: Room 10-Chaulkboard

Asbestos Structures: None Detected
Structures < 5 µm: None Detected
Structures ≥ 5 µm: None Detected
Structure Density (s/mm²): <7.69
Structure Concentration (s/cm²): <370
Asbestos Type(s):
None Detected

Filter Type: MCE
Filter Size (mm²): 962
Pore Size (µm): 0.45
Non-Asbestos Structures: None Detected
Structure Density (s/mm²): <7.69
Structure Concentration (s/cm²): <370
Non-Asbestos Type(s):
None Detected

Lab No.: 7533056
Client No.: T-03

Volume Filtered (mL): 10
Dilution Factor (mL): 50
Grid Openings: 4
Opening Area (mm²): 0.013
Area Analyzed (mm²): 0.0520
Sensitivity (s/mm²): 19.2
Detection Limit (s/cm²): 925
Micrograph Number:
EDXA Spectrum ID:

Area Sampled (cm²): 100
Location: Room 9-Teachers Desk

Asbestos Structures: 13
Structures < 5 µm: 13
Structures ≥ 5 µm: None Detected
Structure Density (s/mm²): 250
Structure Concentration (s/cm²): 12000
Asbestos Type(s):
Chrysotile

Filter Type: MCE
Filter Size (mm²): 962
Pore Size (µm): 0.45
Non-Asbestos Structures: None Detected
Structure Density (s/mm²): <19.2
Structure Concentration (s/cm²): <925
Non-Asbestos Type(s):
None Detected

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

Date Received: 12/1/2022
Date Analyzed: 12/07/2022
Signature:
Analyst: Craig Liska

Approved By:
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Laboratory Director

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Report Date: 12/7/2022
Report No.: 673591 - TEM Dust Microvac
Project: Bicentennial School
Project No.: 30128

TEM DUST SAMPLE ANALYSIS DETAILS

Lab No.: 7533057
Client No.: T-04

Volume Filtered (mL): 10
Dilution Factor (mL): 50
Grid Openings: 4
Opening Area (mm²): 0.013
Area Analyzed (mm²): 0.0520
Sensitivity (s/mm²): 19.2
Detection Limit (s/cm²): 925
Micrograph Number:
EDXA Spectrum ID:

Area Sampled (cm²): 100
Location: Room 9-Chaulkboard

Asbestos Structures: 5
Structures < 5 µm: 4
Structures ≥ 5 µm: 1
Structure Density (s/mm²): 96.2
Structure Concentration (s/cm²): 4630
Asbestos Type(s):
Chrysotile

Filter Type: MCE
Filter Size (mm²): 962
Pore Size (µm): 0.45
Non-Asbestos Structures: None Detected
Structure Density (s/mm²): <19.2
Structure Concentration (s/cm²): <925
Non-Asbestos Type(s):
None Detected

Lab No.: 7533058
Client No.: T-05

Volume Filtered (mL): 10
Dilution Factor (mL): 50
Grid Openings: 4
Opening Area (mm²): 0.013
Area Analyzed (mm²): 0.0520
Sensitivity (s/mm²): 19.2
Detection Limit (s/cm²): 925
Micrograph Number:
EDXA Spectrum ID:

Area Sampled (cm²): 100
Location: Teachers Room-Center Desk

Asbestos Structures: 20
Structures < 5 µm: 20
Structures ≥ 5 µm: None Detected
Structure Density (s/mm²): 385
Structure Concentration (s/cm²): 18500
Asbestos Type(s):
Chrysotile

Filter Type: MCE
Filter Size (mm²): 962
Pore Size (µm): 0.45
Non-Asbestos Structures: None Detected
Structure Density (s/mm²): <19.2
Structure Concentration (s/cm²): <925
Non-Asbestos Type(s):
None Detected

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

Date Received: 12/1/2022
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Signature:
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