



**Thomas Mifflin Elementary School**  
3624 Conrad Street  
Philadelphia, Pennsylvania

## **Asbestos Abatement Air Monitoring Report**

**AUGUST 15, 2018**

**PREPARED FOR:**

School District of Philadelphia  
440 North Broad Street, Room 3053  
Philadelphia, Pennsylvania  
Attn: Mr. Gerald Junod

**PREPARED BY:**

The Vertex Companies, Inc.  
700 Turner Industrial Way  
Aston, Pennsylvania 19014  
**PHONE 610.558.8902**

**VERTEX Project No: 51202**

**Work Order Numbers: 1759080**

**Control No: 2018632003**

**Encumbrance Number: 583018**

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## **1.0 EXECUTIVE SUMMARY**

In June 2018, The Vertex Companies, Inc. (VERTEX) was retained by the School District of Philadelphia to provide air monitoring and laboratory services in conjunction with an abatement project at the Thomas Mifflin Elementary School located at 3624 Conrad Street in Philadelphia, PA. These services were performed under Encumbrance Number 583018, School District Control Number 201632003, and Work Order Number 1759080.

Work activities were initiated in response to the newspaper article (i.e., dated May 10, 2018 online at Philly.com and May 13, 2018 in the Philadelphia Inquirer). The article reported that wipe sampling was performed by a staff member in the independent book storage closet adjacent to Room 204. The analytical result for the single wipe sample collected yielded a level of 407,000 F/cm<sup>2</sup>.

Following the review of the article and the analytical result reported, the School District of Philadelphia initiated a remedial effort to address the reported concerns. To that end, the following protocol was employed:

### **Initial Response**

1. The School District directed one of its contracted consultants to inspect these areas for presence of asbestos containing materials and/or the potential source of the result reported.
2. An inspection was performed in which it was noted that no asbestos containing materials were identified within the book storage closet.
3. In accordance with School District standard protocol, the building inspector prepared an Asbestos Design Data Collection (DDC).

### **Secondary Response**

1. The School District of Philadelphia retained The Vertex Companies, Inc. (VERTEX) to consult/oversee any resulting remediation or abatement to be performed.
2. VERTEX, in conjunction with a representative of the Philadelphia Federation of Teachers, Mr. Jerry Roseman of Occupational Health Consultation Services, Inc. (OHCS) performed a re-inspection of the book storage closet.
3. The re-inspection confirmed that no asbestos containing materials were present within the book storage closet.
4. A revised DDC was prepared. The DDC was utilized to define the abatement remedial effort to be employed within the book storage closet.

## Abatement Redial Effort

1. Abatement operations were initiated on June 18, 2018.
2. All work was performed by members of the School District of Philadelphia's A-Team. The A-Team workers are all licensed by the City of Philadelphia and Commonwealth of Pennsylvania to perform asbestos abatement operations.
3. All licensed workers donned proper personal protective (PPE) equipment, including but not limited to TYVEK® suits and NIOSH approved half-face air purifying respirators.
4. Daily air monitoring was performed by a licensed Asbestos Project Inspector (API) throughout the duration of the remedial effort.
5. A single stage decontamination unit was established at the entrance to the work area.
6. Negative air was established within the work area.
7. All stored materials located within the work area were wet wiped, HEPA vacuumed and removed from the work area (i.e., stored in the hallway).
8. All surfaces (i.e., walls, floor, built-in shelving, etc.) were wet wiped and HEPA vacuumed.
9. All waste generated as part of the removal project was double-bagged and labeled for proper disposal at an EPA approved landfill.
10. At the completion of the remedial effort on June 21, 2018, VERTEX's API performed a visual inspection and did not observe any dust or debris on any surfaces within the work area.
11. Aggressive clearance sampling was performed by both VERTEX and OHCS on June 23, 2018. All three (3) work area samples were analyzed utilizing Transmission Electron Microscopy (TEM).
12. Analytical results of clearance testing for both VERTEX and OHCS yielded levels above the City of Philadelphia's clearance criteria of 0.00467 AS/cc, and above the AHERA clearance criteria <70 AS/mm<sup>2</sup> (one sample yielded a concentration of 78 AS/mm<sup>2</sup>).
13. The work area was re-cleaned on July 12, 2018. Following re-cleaning, API performed a visual inspection and did not observe any dust or debris on any surfaces within the work area.
14. A second set of analytical results of clearance testing for both VERTEX and OHCS yielded levels below the City of Philadelphia's clearance criteria of 0.00467 AS/cc, and the AHERA clearance criteria <70 AS/mm<sup>2</sup>.

## 2.0 PROJECT OVERSIGHT

VERTEX provided an API for on-site inspection and daily air monitoring throughout the duration of the project. Services were performed by certified APIs George Steffe (certification no. 951-1008), William Klinger (certification no. 011-1002), Bernard Brunner (certification no. 064-0008), Louis DiMichele (certification no. 991-1004) and Ed Keegan (certification no.911-1004). The project was managed by Donald P. Heim.



### 3.0 RESULTS

1. Airborne concentrations (i.e., three samples) collected in regulated area after abatement (final clearances) were below the City of Philadelphia's clearance criteria of 0.00467 AS/cc, and the AHERA clearance criteria <70 AS/mm<sup>2</sup>. Note: Initial testing failed to achieve the clearance criteria.
2. Airborne concentrations collected outside the regulated work area during abatement activities (perimeters) yielded levels below 0.01 F/cc.
3. Airborne concentrations collected inside the regulated work area during abatement activities also yielded levels below 0.01 F/cc.

Please refer to the attached PCM Air Sampling Results, for a summary of the air sample results.

### 4.0 ANALYTICAL / AIR MONITORING METHODOLOGIES

**Phase Contrast Microscopy (PCM)** air samples were collected and analyzed in accordance with the National Institute of Safety and Health (NIOSH) Analytical Method #7400, "Asbestos Fibers in Air," using A counting rules. A segment of the collected sample filter is mounted on a slide, treated chemically to make the filter transparent, and then examined using a special microscope reticule and counting procedure with phase contrast illumination at 400 to 500 magnification. Any particle having a length to width (or aspect) ratio greater than 3:1, and a length of 5 micrometers (µm) or greater is counted as a fiber. PCM analysis does not distinguish between asbestos and non-asbestos fibers.

All air samples were collected by the high-volume method in which a pump is used to draw a volume of air through a membrane filter at a known rate. Typical sampling rates for final air testing are less than 10 Liters per minute (L/min) for approximately 1200-1,800 liters. Samples are collected in 25-millimeter (mm) cassettes containing a mixed cellulose ester (MCE) filter with a 0.8 µm-effective pore size for PCM analysis.

Initial final clearance air samples were collected and analyzed by Transmission Electron Microscopy (TEM). Analysis was performed by EMSL Analytical, Inc. of Cinnaminson, New Jersey.

Secondary final clearance air samples were collected and analyzed by Transmission Electron Microscopy (TEM). Analysis was performed International Asbestos Testing Laboratories (IATL) of Mount Laurel, New Jersey (AIHA #100188).

## 5.0 SUMMARY OF PCM AIR SAMPLING RESULTS

<b>Thomas Mifflin Elementary School</b> <b>3624 Conrad Street</b> <b>Philadelphia, Pennsylvania</b>				
<b>Date collected: 6/18/18</b> <b>Site Activity/Work Area: O&amp;M Wet Wipe, HEPA Vac Supply Closet Across from 202</b>				
Sample #	Sample Location/Activity	Volume (L)	Fibers per 100 Fields	Sample Result (F/cc)
6.18.01	Next to supply closet entrance	1200	7	0.003
6.18.02	Room 202, at AFD exhaust	1210	10	0.004
6.18.03	Hall outside 209	1215	8	0.003
6.18.04	Next to supply closet entrance	1274	5	<0.002
6.18.05	Room 202, at AFD exhaust	1267	12	0.005
6.18.06	Hall outside 209	1274	8	0.003
6.18.07	Blank	-	0	-
<b>Date collected: 6/19/18</b> <b>Site Activity/Work Area: O&amp;M Wet Wipe, HEPA Vac Supply Closet Across from 202</b>				
6.19.01	At 1 stage decon to supply closet	1260	8	0.003
6.19.02	In room 202, AFD exhaust area	1272	11	0.004
6.19.03	Hall across from 2 <sup>nd</sup> floor boy's room, 100' from work area	1266	5	<0.002
6.19.04	At 1 stage decon to supply closet work area	1274	10	0.004
6.19.05	In room 202, AFD exhaust area	1274	7	0.003
6.19.06	Hall across from 2 <sup>nd</sup> floor boy's room, 100' from work area	1281	4	<0.002
6.19.07	Blank	-	0	-
<b>Date collected: 6/20/18</b> <b>Site Activity/Work Area: O&amp;M Wet Wipe, HEPA Vac Supply Closet Across from 202</b>				
6.20.01	Perimeter: In hall outside room 202	819	1.5	<0.003
6.20.02	Perimeter: In hall outside room 204	819	0	<0.003
6.20.03	Decon: In 1 stage entrance to closet	810	3	<0.003
6.20.04	Work area: On closet shelf	810	2.5	<0.003
6.20.05	Blank	-	0	-

**Thomas Mifflin Elementary School  
3624 Conrad Street  
Philadelphia, Pennsylvania**

**Date collected: 6/21/18**

**Site Activity/Work Area: O&M Wet Wipe, HEPA Vac Supply Closet Across from 202**

Sample #	Sample Location/Activity	Volume (L)	Fibers per 100 Fields	Sample Result (F/cc)
6.21.01	Next to supply closet	1266	12	0.05
6.21.02	In room 202, AFD exhaust area	1272	8	0.003
6.21.03	Hall across from 2 <sup>nd</sup> floor boy's room, 100' from work area	1278	9	0.003
6.21.04	Next to supply closet entrance	1281	10	0.003
6.21.05	In room 202, AFD exhaust area	1288	5	<0.002
6.21.06	Hall across from 2 <sup>nd</sup> floor boy's room, 100' from work area	1274	6	0.002
6.21.07	Blank	-	0	-

**Date collected: 7/12/18**

**Site Activity/Work Area: O&M Wet Wipe, HEPA Vac Supply Closet Across from 202**

7.12.01	Perimeter: 2 <sup>nd</sup> floor hall	840	0	<0.002
7.12.02	Perimeter: 2 <sup>nd</sup> floor by 1-stage decon	840	0	<0.002
7.12.03	Blank	-	0	-

## 6.0 SUMMARY OF TEM AIR SAMPLING RESULTS



**EMSL Analytical, Inc.**

200 Route 130 North, Cinnaminson, NJ 08077

Phone/Fax: (800) 220-3675 / (856) 786-5974

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

EMSL Order:	041818966
CustomerID:	VRTX78
CustomerPO:	
ProjectID:	

Attn: **Don Heim**  
**The Vertex Companies, Inc.**  
**700 Turner Way, Suite 105**  
**Aston, PA 19014**

Phone: (610) 558-8902  
 Fax: (610) 558-8904  
 Received: 06/26/18 12:00 PM  
 Analysis Date: 6/26/2018  
 Collected: 6/23/2018

Project: **Mifflin ES / 51202**

**Test Report: Asbestos Fiber Analysis by Transmission Electron Microscopy (TEM)**  
**Performed by EPA 40 CFR Part 763 Appendix A to Subpart E**

Sample	Location	Volume (Liters)	Non Asb	Area Analyzed (mm <sup>2</sup> )	Asbestos Type(s)	# Structure ≥ 0.5μ -5μ ≥ 5μ	Analytical Sensitivity (S/cc)	Asbestos Concentration	
								(S/mm <sup>2</sup> )	(S/cc)
MES-04 041818966-0004	Outside Work Area - Outside Classroom 202	1805.00	0	0.0516	None Detected		0.0041	<19.00	<0.0041
MES-05 041818966-0005	Outside Work Area - Outside Classroom 203	1805.00	0	0.0516	None Detected		0.0041	<19.00	<0.0041
MES-06 041818966-0006	Outside Work Area - Outside Classroom 204	1805.00	0	0.0516	None Detected		0.0041	<19.00	<0.0041

<b>Geometric Mean (S/cc):</b>	<b>0.00410</b>
-------------------------------	----------------

Analyst(s)  
 \_\_\_\_\_  
 Matthew Dare (3)

\_\_\_\_\_  
 Benjamin Ellis, Laboratory Manager  
 or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. EMSL is not responsible for data reported in structures/cc, which is dependent on volume collected by non-laboratory personnel. Samples received in good condition unless otherwise noted. The test results meet the requirements of NELAC unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request.  
 Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Report Amended: 06/26/2018 09:05:14 Replaces the Initial Report . Reason Code: Data Entry-Results Changed



# EMSL Analytical, Inc.

200 Route 130 North Cinnaminson, NJ 08077

Tel/Fax: (800) 220-3675 /

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

EMSL Order: 041818966

Customer ID: VRTX78

Customer PO:

Project ID:

**Attention:** Don Heim  
The Vertex Companies, Inc.  
700 Turner Way, Suite 105  
Aston, PA 19014

**Phone:** (610) 558-8902

**Fax:** (610) 558-8904

**Received Date:** 06/26/2018 12:00 PM

**Analysis Date:** 06/23/2018 - 06/26/2018

**Collected Date:** 06/23/2018

**Project:** Mifflin ES / 51202

## Test Report: Asbestos Fiber Analysis by Transmission Electron Microscopy (TEM) Performed by EPA 40 CFR Part 763 Appendix A to Subpart E

Sample	Location	Volume (Liters)	Area Analyzed (mm <sup>2</sup> )	Non Asb	Asbestos Type(s)	#Structures		Analytical Sensitivity (S/cc)	Asbestos Concentration	
						≥0.5μ < 5μ	≥5μ		(S/mm <sup>2</sup> )	(S/cc)
MES-01	Inside Work Area - Rear of Closet	1805.00	0.0512	0	Chrysotile	3	1	0.0042	78.00	0.0170
<i>041818966-0001</i>										
MES-02	Inside Work Area - Center of Closet	1805.00	0.0512	0	None Detected	0	0	0.0042	<20.00	<0.0042
<i>041818966-0002</i>										
MES-03	Inside Work Area - Closet near Entrance	1805.00	0.0512	0	None Detected	0	0	0.0042	<20.00	<0.0042
<i>041818966-0003</i>										
MES-04	Outside Work Area - Outside Classroom 202	1805.00	0.0516	0	None Detected	0	0	0.0041	<19.00	<0.0041
<i>041818966-0004</i>										
MES-05	Outside Work Area - Outside Classroom 203	1805.00	0.0516	0	None Detected	0	0	0.0041	<19.00	<0.0041
<i>041818966-0005</i>										
MES-06	Outside Work Area - Outside Classroom 204	1805.00	0.0516	0	None Detected	0	0	0.0041	<19.00	<0.0041
<i>041818966-0006</i>										

Analyst(s)

*Darrah Johnson-McDaniel (1)*

*Ted Young (2)*

*Matthew Dare (3)*

Benjamin Ellis, Laboratory Manager  
or other approved signatory

EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. This report must not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. EMSL is not responsible for data reported in structures/cc, which is dependent on volume collected by non-laboratory personnel. Samples received in good condition unless otherwise noted. The test results meet the requirements of NELAC unless otherwise noted. Estimated accuracy, precision and uncertainty data available upon request.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ NVLAP Lab Code 101048-0, AIHA-LAP, LLC-IHLAP Lab 100194, NYS ELAP 10872, NJ DEP 03036, PA ID# 68-00367

Report amended: 06/26/2018 09:05 AM Replaces amended report from: 06/23/2018 16:23 PM Reason Code: Data Entry-Results Changed

**PRELIMINARY RESULTS**  
**Airborne Asbestos Analysis**  
**TEM AHERA**

Client: Vertex  
700 Turner Way Suite 105  
Aston PA 19014

Client No.: VER100

Batch No.: 568368  
Project: Mifflin ES  
Project No.: 51202  
Philly Regs: Y  
Turn-Around Time: 1 Day

Client Contacts:	Laboratory Contacts:
Contacts: _____	Contacts: <u>Frank E. Ehrenfeld III</u>
Phone: _____	Phone: <u>(856) 231-9449</u>
Fax: _____	Fax: <u>(856) 231-9818</u>
Cell/Pager: _____	Cell/Pager: <u>(609) 929-4211</u>
E-Mail: _____	E-Mail: <u>frankehrenfeld@iatl.com</u>

Chain of Custody:			
Samples Taken in Field: _____	Date: _____	Time: _____	
Samples Rec'd at Laboratory: <u>TM</u>	Date: <u>7/16/2018</u>	Time: _____	
Samples Analyzed: <u>M. Stewart</u>	Date: <u>7/17/2018</u>	Time: _____	
Preliminary Results Faxed: _____	Date: _____	Time: _____	
Preliminary Results E-Mail: _____	Date: _____	Time: _____	

**Summary Data**  
**Transmission Electron Microscopy**  
**AHERA 40CFR 763**

Client Sample ID #	IATL Sample ID #	Volume (L)	Comments	Results s/mm <sup>2</sup>	Results s/cc
MES-071618-01	6559324	1805	None Detected	< 19.2	< 0.0041
MES-071618-02	6559325	1805	None Detected	< 19.2	< 0.0041
MES-071618-03	6559326	1805	None Detected	< 19.2	< 0.0041

AHERA Clearance Criteria is 70 s/mm <sup>2</sup> .	Average (s/mm <sup>2</sup> ) = <u>19.2</u>	Grid Box #: <u>1087</u>
Phila. Regulations Clearance Criteria is 0.00467 s/cc	Geo = 0.0041	
Z Test Results (see attached, if applicable)		Instrument (I, II, III) <u>III</u>

These preliminary results are issued by IATL to expedite procedures by the clients based upon the above data. IATL assumes that all of the sampling methods and data upon which these results are based, has been accurately supplied by the client. These results may not have been reviewed by the Laboratory Director. Final Certificates of Analysis will follow these preliminary results. The signed COAs are to be considered the official results.

TEM.AHERA.001 Revision Date 06/22/18

Client Name: Vertex      Analysis Date: 07/17/18      IATL Sample #: 6559324  
 Client Project #: 51202      Client Sample #: MES-071618-01  
 Sample Type: AHERA -Philly Regulations      IATL Grid Box #: 1087  
 QC Submittal: R      Grid Archive ID #: S2S4

Electron Microscope ID: \_\_\_\_\_      Filter Dia. (mm): 25      Magnification: 20,000X  
 III JEOL, JEM-1230, EM18440033      Effective Area (mm): 385  
 EVEX      Filter Type: MCE      Accelerating Voltage: 100KeV  
 Filter Pore Size (μm): 0.45

Grid Opening: 0.115 mm      Volume of Air Sampled: 1805 Liters  
 Grid opening Area: 0.013 mm<sup>2</sup>  
 Grid Openings Read/Required: 4 / 4      Analytical Sensitivity: 19.2 mm<sup>2</sup>  
 Total Area Analyzed: 0.0520 mm<sup>2</sup>      Minimum Detection Limit: 0.0041 s/cc

Total Asbestos Structures: NSD      Non-Asbestos Structures: NSD  
 0.5μm - 5.0μm: NSD  
 >5.0μm: \_\_\_\_\_  
 Asbestos: < 19.2 s/mm<sup>2</sup>      Non-Asbestos: < 19.2 s/mm<sup>2</sup>  
 Asbestos: < 0.0041 s/cc      Non-Asbestos: < 0.0041 s/cc

**Analysis Data:**

Grid Opening ID	Structure Number	Structure Type F/B/C/M	<sup>1</sup> Length 0.5 - 5.0 μm	<sup>2</sup> Length > 5.0 μm	* Chrysotile	**Amphibole	***Non-Asbestos	Micrograph / EDS ID
S2	D9	NSD						
	E8	NSD						
S4	C4	NSD						
	B3	NSD						
Total:	NSD	NSD	0	0	0	0	0	

\* Must confirm by Morphology, SAED, and EDXA for each suspect asbestos fiber. Record visible prominent Chrysotile DP reflections (002, 004, 110, 130, 220, 200)  
 \*\* Define Amphibole (DP obtained Y/N). Print-out EDS and attach.  
 \*\*\* Characterize by EDS  
 1, 2 Record Structure Length & Width (μm)      SEE REVERSE: FIBER ORIENTATION MAP

Prep Quality: \_\_\_\_\_  
 Dissolution: Good  
 Carbon Film: Good  
 Loading: 1%

Comments: \_\_\_\_\_  
 Analyzed By: M. Stewart  
 Reviewed By: [Signature]

Client Name: Vertex  
 Client Project #: 51202  
 Sample Type: AHERA -Philly Regulations  
 QC Submittal

Analysis Date:  
07/17/18

IATL Sample #: 6559326  
 Client Sample #: MES-071618-03  
 IATL Grid Box #: 1087  
 Grid Archive ID #: S10T1

Electron Microscope ID:	Filter Dia. (mm): <u>25</u>	Magnification: <u>20,000X</u>
III JEOL JEM-1230, EM18440033	Effective Area (mm): <u>385</u>	Accelerating Voltage: <u>100KeV</u>
EVEX	Filter Type: <u>MCE</u>	
	Filter Pore Size (µm): <u>0.45</u>	

Grid Opening: <u>0.115</u> mm	Volume of Air Sampled: <u>1805</u> Liters
Grid opening Area: <u>0.013</u> mm <sup>2</sup>	Analytical Sensitivity: <u>19.2</u> mm <sup>2</sup>
Grid Openings Read/Required: <u>4</u> / <u>4</u>	Minimum Detection Limit: <u>0.0041</u> s/cc
Total Area Analyzed: <u>0.0520</u> mm <sup>2</sup>	

Total Asbestos Structures: <u>NSD</u>	Non-Asbestos Structures: <u>NSD</u>
0.5µm - 5.0µm: <u>NSD</u>	
>5.0µm: _____	
Asbestos: <u>&lt; 19.2</u> s/mm <sup>2</sup>	Non-Asbestos: <u>&lt; 19.2</u> s/mm <sup>2</sup>
Asbestos: <u>&lt; 0.0041</u> s/cc	Non-Asbestos: <u>&lt; 0.0041</u> s/cc

**Analysis Data:**

Grid Opening ID	Structure Number	Structure Type F/B/C/M	<sup>1</sup> Length 0.5 - 5.0 µm	<sup>2</sup> Length > 5.0 µm	* Chrysotile	**Amphibole	***Non-Asbestos	Micrograph / EDS ID
S10	B7	NSD						
	A6	NSD						
T1	G1	NSD						
	H2	NSD						
<b>Total:</b>	NSD	NSD	0	0	0	0	0	

\* Must confirm by Morphology, SAED, and EDXA for each suspect asbestos fiber  
 Record visible prominent Chrysotile DP reflections (002 .004, 110, 130, 220, 200)  
 \*\* Define Amphibole (DP obtained Y/N). Print-out EDS and attach.  
 \*\*\* Characterize by EDS  
 1, 2 Record Structure Length & Width (µm) SEE REVERSE: FIBER ORIENTATION MAP

<b>Prep Quality:</b>	
Dissolution	<u>Good</u>
Carbon Film	<u>Fair</u>
Loading	<u>1%</u>

Comments: \_\_\_\_\_  
 Analyzed By: M. Stewart  
 Reviewed By: \_\_\_\_\_

CERTIFICATE OF ANALYSIS

Client: The Vertex Companies, Inc.  
700 Turner Way, Suite 105  
ASTON PA 19014

Report Date: 7/17/2018  
Report No.: 568368 - TEM AHERA  
Project: Mifflin Elementary School PSD  
Project No.: 51202

Client: VER100

TEM AIR SAMPLE ANALYSIS SUMMARY

Lab No.: 6559324  
Client No.: MES-07161801

Volume: 1805.0 L  
Location: IWA-2nd Floor Closet Next To Room  
204 (In)  
Date Sampled: 7/16/18

Density (s/mm<sup>3</sup>): <19.2  
Concentration (s/cc): <0.0041  
Asbestos Type(s): None Detected

Lab No.: 6559325  
Client No.: MES-07161802

Volume: 1805.0 L  
Location: IWA-2nd Floor Closet Next To Room  
204 (In)  
Date Sampled: 7/16/18

Density (s/mm<sup>3</sup>): <19.2  
Concentration (s/cc): <0.0041  
Asbestos Type(s): None Detected


Lab No.: 6559326  
Client No.: MES-07161803

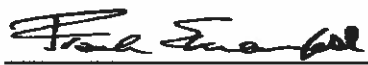
Volume: 1805.0 L  
Location: IWA-2nd Floor Closet Next To Room  
204 (In)  
Date Sampled: 7/16/18

Density (s/mm<sup>3</sup>): <19.2  
Concentration (s/cc): <0.0041  
Asbestos Type(s): None Detected

Geometric Mean = 0.0041 Structures/cc

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

Date Received: 7/16/2018  
Date Analyzed: 07/17/2018  
Signature:   
Analyst: Mark Stewart

Approved By:   
Frank E. Ehrenfeld, III  
Laboratory Director

---

CERTIFICATE OF ANALYSIS

---

Client: The Vertex Companies, Inc.  
700 Turner Way, Suite 105  
ASTON PA 19014

Report Date: 7/17/2018  
Report No.: 568368 - TEM AHERA  
Project: Mifflin Elementary School PSD  
Project No.: 51202

Client: VER100

## Appendix to Analytical Report:

**Customer Contact:** Don Heim  
**Method:** 40 CFR 763 Final Rule

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

**iATL Customer Service:** customerservice@iatl.com  
**iATL Office Manager:** cdavis@iatl.com  
**iATL Account Representative:** Pete Lesniak  
**Sample Matrix:** Air Cassettes

### 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](http://www.iATL.com) and in our Quality Assurance Manual per ISO 17025 standard requirements. The information therein is a representation of iATL definitions and policies for turnaround times, sample submittal, collection media, blank definitions, quantification issues and limit of detection, analytical methods and procedures, sub-contracting policies, results reporting options, fees, terms, and discounts, confidentiality, sample archival and disposal, and data interpretation.

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

### Information Pertinent to this Report:

Analysis by 40 CFR 763 Final Rule

#### Certifications:

- NIST-NVLAP No. 101165-0
- NYSDOH-ELAP No. 11021

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.

Detection Limit (Reporting Limit) is dependent upon the volume of air sampled. AHERA guidelines recommend a minimum of 1200 L (0.0049 s/cc).

### 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.

CERTIFICATE OF ANALYSIS

Client: The Vertex Companies, Inc.  
700 Turner Way, Suite 105  
ASTON PA 19014  
  
Client: VER100

Report Date: 7/17/2018  
Report No.: 568368 - TEM AHERA  
Project: Mifflin Elementary School PSD  
Project No.: 51202

TEM AIR SAMPLE ANALYSIS DETAILS

Lab No.: 6559324  
Client No.: MES-07161801

Volume (L): 1805.0 L  
Date Sampled: 7/16/18  
Location: IWA-2nd Floor Closet Next To Room 204 (1n)

Filter Type: MCE  
Filter Size (mm<sup>2</sup>): 385  
Pore Size (µm): 0.45

Grid Openings: 4  
Opening Area (mm<sup>2</sup>): 0.013  
Area Analyzed (mm<sup>2</sup>): 0.0520  
Sensitivity (s/mm<sup>2</sup>): 19.2  
Detection Limit (s/cc): 0.0041

Asbestos Structures: None Detected  
  
Structures 0.5 µm to <5.0 µm: None Detected  
Structures ≥ 5.0 µm: None Detected  
Structure Density (s/mm<sup>2</sup>): <19.2  
Structure Concentration (s/cc): <0.0041  
Asbestos Type(s): None Detected

Non-Asbestos Structures: None Detected  
  
Structure Density (s/mm<sup>2</sup>): <19.2  
Structure Concentration (s/cc): <0.0041  
Non-Asbestos Type(s): None Detected

Micrograph Number:  
EDXA Spectrum ID:

Lab No.: 6559325  
Client No.: MES-07161802

Volume (L): 1805.0 L  
Date Sampled: 7/16/18  
Location: IWA-2nd Floor Closet Next To Room 204 (1n)

Filter Type: MCE  
Filter Size (mm<sup>2</sup>): 385  
Pore Size (µm): 0.45

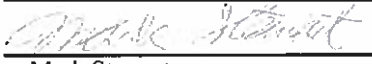
Grid Openings: 4  
Opening Area (mm<sup>2</sup>): 0.013  
Area Analyzed (mm<sup>2</sup>): 0.0520  
Sensitivity (s/mm<sup>2</sup>): 19.2  
Detection Limit (s/cc): 0.0041


Asbestos Structures: None Detected  
  
Structures 0.5 µm to <5.0 µm: None Detected  
Structures ≥ 5.0 µm: None Detected  
Structure Density (s/mm<sup>2</sup>): <19.2  
Structure Concentration (s/cc): <0.0041  
Asbestos Type(s): None Detected

Non-Asbestos Structures: None Detected  
  
Structure Density (s/mm<sup>2</sup>): <19.2  
Structure Concentration (s/cc): <0.0041  
Non-Asbestos Type(s): None Detected

Micrograph Number:  
EDXA Spectrum ID:

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

Date Received: 7/16/2018  
Date Analyzed: 07/17/2018  
Signature:   
Analyst: Mark Stewart

Approved By:   
Frank E. Ehrenfeld, III  
Laboratory Director



CERTIFICATE OF ANALYSIS

Client: The Vertex Companies, Inc.  
700 Turner Way, Suite 105  
ASTON PA 19014

Report Date: 7/17/2018  
Report No.: 568368 - TEM AHERA  
Project: Mifflin Elementary School PSD  
Project No.: 51202

Client: VER100

TEM AIR SAMPLE ANALYSIS DETAILS

Lab No.: 6559326  
Client No.: MES-07161803

Volume (L): 1805.0 L  
Date Sampled: 7/16/18  
Location: IWA-2nd Floor Closet Next To Room  
204 (In)

Filter Type: MCE  
Filter Size (mm<sup>2</sup>): 385  
Pore Size (µm): 0.45


Grid Openings: 4  
Opening Area (mm<sup>2</sup>): 0.013  
Area Analyzed (mm<sup>2</sup>): 0.0520  
Sensitivity (s/mm<sup>2</sup>): 19.2  
Detection Limit (s/cc): 0.0041


Asbestos Structures: None Detected  
Structures 0.5 µm to <5.0 µm: None Detected  
Structures ≥ 5.0 µm: None Detected  
Structure Density (s/mm<sup>2</sup>): <19.2  
Structure Concentration (s/cc): <0.0041  
Asbestos Type(s): None Detected

Non-Asbestos Structures: None Detected  
Structure Density (s/mm<sup>2</sup>): <19.2  
Structure Concentration (s/cc): <0.0041  
Non-Asbestos Type(s): None Detected

Micrograph Number:  
EDXA Spectrum ID:  
Geometric Mean = 0.0041 Structures/cc

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

Date Received: 7/16/2018  
Date Analyzed: 07/17/2018  
Signature:   
Analyst: Mark Stewart

Approved By:   
Frank E. Ehrenfeld, III  
Laboratory Director

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CERTIFICATE OF ANALYSIS

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Client: The Vertex Companies, Inc.  
700 Turner Way, Suite 105  
ASTON PA 19014

Report Date: 7/17/2018  
Report No.: 568368 - TEM AHERA  
Project: Mifflin Elementary School PSD  
Project No.: 51202

Client: VER100