4221 Forbes Boulevard · Suite 250
Lanham, Maryland 20706
T: 202.558.7487 | http://atiinc.com/

June 17, 2019

Prince George's County Public Schools
13300 Old Marlboro Pike
Upper Marlboro, Maryland 20772
Attention: Mr. Alex Baylor

RE: Indoor Air Quality Screening, Woodmore Elementary School Follow-up Screening of Room 2
IFB: 022-19
ATI Project Number: ATI19-666

Dear Mr. Baylor:

Prince George's County Public Schools requested that ATI, Inc., conduct a proactive indoor air quality (IAQ) screening at Woodmore Elementary School. The initial IAQ screening was conducted on May 15, 2019, and a follow-up screening of Room 2 occurred on June 13, 2019. Its key findings are enclosed in the Executive Summary on page three, and the official laboratory report for total fungal spore trap sampling is enclosed in Appendix A.

Thank you for the opportunity to provide Industrial Hygiene services for Prince George's County Public Schools. If you have any questions regarding this report, please contact us at (202) 643-4283.

Sincerely,
ATI, INC.

Courtney E. McCall
Project Manager

Sarath Seneviratne
CIH, CSP, CHMM

Indoor Air Quality Screening Report:
Follow-Up Screening of Room 2

Prince George's County Public Schools
Woodmore Elementary School
12500 Woodmore Road
Mitchellville, Maryland 20721

Prepared for:

Prince George's County Public Schools
13300 Old Marlboro Pike
Upper Marlboro, Maryland 20772

June 17, 2019

Submitted by:

ATI Job # 19-666

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Table of Contents

Abbreviations and Acronyms

AHU	Air-Handling Unit
AIHA	American Industrial Hygiene Association
ASHRAE	American Society of Heating, Refrigerating and Air-Conditioning Engineers
ASTM	American Society for Testing and Materials
CO	Carbon Monoxide
CO_2	Carbon Dioxide
EMLAP	Environmental Microbiology Laboratory Accreditation Program
HVAC	Heating, Ventilating, And Air-Conditioning
IAQ	Indoor Air Quality
NIST	National Institute for Standards and Technology
NVLAP	National Voluntary Laboratory Accreditation Program
Rev.	Revision
RH	Relative Humidity

Abbreviations involving scientific volume and measurements involving media or water sampling

Counts/m^3	Mold spores per cubic meter of air
LPM	Liters Per Minute
NTE	Not to exceed
°F	degree Fahrenheit
PPM	Parts Per Million

1. Executive Summary and Key Findings

ATI conducted a follow-up Indoor Air Quality (IAQ) screening on June 13, 2019, at Woodmore Elementary School, located at 12500 Woodmore Road, Mitchellville, MD 20769, after elevated levels of Aspergillus/Penicillium were detected in Room 2 during the initial screening on May 15, 2019.

The screening included a visual assessment of Room 2 and a collection of direct reading measurements for comfort parameters, including temperature, relative humidity, carbon dioxide, and carbon monoxide. Also, ATI collected total fungal air samples in Room 2 and outside on spore trap cassettes for microbiological analysis.

The following is a summary of the key findings from this follow-up screening:

1. The temperature measurements in Room 2 were within ASHRAE guidelines for summer temperatures, between 73°F and 79°F.
2. The relative humidity measurements in Room 2 were within ASHRAE guidelines, <65%.
3. Room 2 exceeded the recommended ASHRAE limit for carbon dioxide for the day, which was 1,098.5 parts per million (PPM).
4. Carbon monoxide was not detected in Room 2.
5. The Aspergillus/Penicillium levels in Room 2 on the June 13th follow-up sampling event decreased by about 78% since the May 15th sampling event. Water damaged ceiling tiles were observed in the bathroom in Room 2, which could be contributing to the presence of Aspergillus/Penicillium in the space. Replacing the ceiling tiles is recommended. Other spores detected in the room did not exceed the outdoor sample, which is favorable.

2. Assessment Methods

Mr. Brian Chapman of ATI, Inc., conducted a visual assessment and air sampling on June 13, 2019, limited to Room 2 and an outdoor sample. Visual observations were made at the time the samples were collected. ATI references the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) *Standard 62.1 – 2016* and ASHRAE *Standard 55 – 2017* when providing IAQ services to clients. ASHRAE is an industry leader on energy efficiency and indoor air quality.

All measurements and air samples were collected between three-six feet from floor elevation, which represents the breathing zone, and away from air-supply and return diffusers. Real-time direct readings for temperature, relative humidity, carbon dioxide (CO_2), and carbon monoxide (CO), were obtained with a calibrated TSI Q-Trak 7575-X Meter and attached 982 Probe.

Total fungal air samples were collected with a Buck BioAire High-Volume Sampling Pump on Zefon Air-O-Cell spore-trap cassettes at a flow rate of 15 liters per minute for five minutes, for a sample volume of 75 liters. The samples were analyzed by direct microscopic examination (identifies and counts both viable and non-viable spores, which is then considered "total fungal"), via the American Society for Testing and Materials (ASTM) Standard D7391-09 by EMSL Analytical, Inc., (EMSL) located in Beltsville, MD.

EMSL participates in the National Institute of Standards and Technology's (NIST's) National Voluntary Laboratory Accreditation Program (NVLAP) for general laboratory performance and management and the American Industrial Hygiene Association (AIHA) Environmental Microbial Laboratory Accreditation Program (EMLAP, Certificate Number 102891).

Instrument calibration records are included in Appendix B of this report.

3. Visual Observations

Table 1: Visual Observations and Sampling Locations

Sample Location	Observations
Outside	• Partly cloudy with rain earlier in the morning. • Light winds. • No vehicle/foot traffic. • Samples taken in middle of parking lot.
Room 2	• No occupants in room during sampling. • Bathroom in classroom and its door was open during sampling. • Emergency exit in room – outside air access. • One sink present in room. • Three stained ceiling tiles in the bathroom, and one ceiling tile was sagging from moisture. • Space is approximately 955 ft.^{2}

4. Thermal Environmental Conditions for Human Occupancy

ASHRAE *Standard 55-2017, Thermal Environmental Conditions for Human Occupancy*, addresses thermal comfort in an office environment, which means that an employee wearing a normal amount of clothing feels neither too cold nor too warm. This standard discusses thermal comfort within the context of air temperature, humidity, and air movement and provides recommended ranges for temperature and humidity that are intended to satisfy most building occupants. The recommended ASHRAE ranges are referenced below by each comfort parameter.

4.1 Temperature

The ASHRAE standard establishes a winter comfort range of between 68°F and 75°F and a summer range of between 73°F and 79°F. The temperature measurements obtained during the June 13, 2019, screening are summarized in Table 2. As indicated by the data in the table, the temperature in Room 2 was within the ASHRAE recommended summer comfort range.

Table 2: Temperature Measurements

Sample Location	June 13, 2019 °F			ASHRAE Standard °F
	Min	Max	Average	
Outside	76.8	77.1	77	N/A
Indoors				
Room 2	74.3	75.1	74.7	73 – 79

4.2 Relative Humidity

Relative humidity is a key factor for mold growth. Mold has the potential of growing on suitable surfaces with humidity levels above 65%. ASHRAE *Standard 62.1-2016*, *Ventilation for Acceptable Indoor Air Quality,* recommends a maximum indoor relative humidity of 65% to prevent condensation of moisture on surfaces. Relative humidity below 30% may result in drying of the mucous membranes and skin. Relative humidity measurements are summarized in Table 3. Relative humidity measurements in Room 2 were <65%, in accordance with ASHRAE's recommended relative humidity range.

Table 3: Relative Humidity Measurements

Sample Location	June 13, 2019 (%)			ASHRAE Standard (% RH)
	Min	Max	Average	
Outside	59.4	65	62.2	N/A
Inside				
Room 2	43.4	46.4	44.9	< 65

4.3 Carbon Dioxide

Carbon dioxide measurements within an occupied building are a standard method used to gauge the efficiency of ventilation systems. Carbon dioxide is a by-product of human respiration and does not pose an acute health hazard alone. Elevated concentrations may suggest that insufficient fresh air is being supplied to an occupied space and/or that the ventilation system does not provide a sufficient rate of air exchange.

Research has indicated that buildings with adequately operating ventilation systems are able to remove odors generated by activities in an indoor office environment efficiently. ASHRAE *Standard 62.1-2016* states that comfort (odor) criteria with respect to human bioeffluents are likely to be satisfied if the ventilation results indoor carbon dioxide concentrations are less than 700 parts per million (ppm) above the outdoor air concentration.

Carbon dioxide measurements are summarized in Table 4. On the day of the screening, the average outdoor carbon dioxide concentration obtained was 398.5 ppm, which calculates to a maximum indoor concentration of 1,098.5 ppm (700 + 398.5). The carbon dioxide level in Room 2 exceeded ASHRAE's recommended maximum value of 1,098.5, and the carbon dioxide level average in Room 2 was 1,121 ppm.

Table 4: Carbon Dioxide Measurements

Sample Location	June 13, 2019 Concentration (parts per million)			ASHRAE Standard (ppm) NTE
	Min	Max	Average	
Outside	394	403	398.5	N/A
Inside				
Room 2	1,118	1,124	1,121	1,098.5

4.4 Carbon Monoxide

Carbon monoxide is a colorless and odorless gas produced by the incomplete combustion of carbon containing fuels. Oil, gasoline, diesel fuels, wood, coke, and coal are the major sources of carbon monoxide. ASHRAE recommends that carbon monoxide not exceed nine ppm indoors. As indicated by the data in Table 5, carbon monoxide was not detected in Room 2.

Table 5: Carbon Monoxide Measurements

Sample Location	June 13, 2019 Concentration (parts per million)			ASHRAE Standard (ppm)
	Min	Max	Average	
Outside	0	0	0	N/A
Inside				
Room 2	0	0	0	< 9

5. Total Fungal Air Sampling Results

Mold needs a food source, moisture, proper temperature and humidity, and at times, a source of light, to grow in an environment. Air infiltration through building entrances and exits, open windows and loading docks, and foot traffic into buildings, including the HVAC system all serve as primary pathways that can carry fungi indoors. Water leaks and humid conditions inside of buildings provide the moisture that fosters mold growth.

The June 13, 2019, mold screening sampled air using spore trap cassettes in Room 2 and outdoors. These cassettes collect both viable spores, those capable of producing more fungal colonies, and non-viable spores, which cannot reproduce. Based upon recognized industry practices, indoor mold concentrations are compared with those detected outdoors, which are also known as ambient or baseline samples.

In normal circumstances, the diversity of spores identified indoors and outdoors should be similar with some exceptions. The high concentration of one or two species of fungal spores identified indoors and the absence of the same species outdoors can indicate a moisture problem with the potential to degrade the air quality. Fungi species present indoors are typically found at levels ranging from approximately 10-50% of their levels in the outdoor air, reflecting the filtering by the building's HVAC system.

The official laboratory report with spore trap samples collected on June 13, 2019, is presented in Appendix A. The total concentration of spores in the outside sample was 23,690 counts/m^3, and the total counts in Room 2 were 1,960 counts/m^3. Ascospores, Basidiospores and Cladosporium were detected in Room 2 at levels below the outdoor sample, which is favorable.

During the June 13th follow-up sampling event, Aspergillus/Penicillium was detected at 780 counts/m^3, while the outside sample detected zero. This level is improved over the May 15th sampling event where 3,600 counts/m^3 were detected in Room 2 and the outside sample detected zero. During the June 13th sampling event, ATI observed stained ceiling tiles and a ceiling tile sagging from moisture in the bathroom adjoining Room 2. These damaged ceiling tiles could be causing the Aspergillus/Penicillium to remain in the room.

6. Summary of Findings

ASHRAE comfort parameters including temperature, relative humidity, and carbon monoxide were within recommended ranges in all tested areas. The carbon dioxide level in Room 2 exceeded ASHRAE's recommended maximum for the day.

Aspergillus/Penicillium levels in Room 2 on the June 13th follow-up sampling event decreased by about 78% since the May 15th sampling event. Water damaged ceiling tiles were observed in the bathroom in Room 2, which could be contributing to the presence of Aspergillus/Penicillium in the space. Replacing the ceiling tiles is recommended. Other spores detected in the room did not exceed the outdoor sample, which is favorable.

We appreciate the opportunity to provide these IAQ testing services for you. If you have any questions, please contact us at (202) 643-4283.

Sincerely,
ATI, INC.

Courtney E. McCall
Project Manager

Sarath Seneviratne
CIH, CSP, CHMM

Appendix A:
Laboratory Report and Chain of Custody

EMSL Analytical, Inc.

10768 Baltimore Avenue Beltsville, MD 20705

Tel/Fax: (301) 937-5700 / (301) 937-5701

http://www.EMSL.com / beltsvillelab@emsl.com

EMSL Order: 191906876
Customer ID: ATII25A
Customer PO:
Project ID:

Attn: Brian Chapman
ATI
4221 Forbes Blvd
Suite 250
Lanham, MD 20706
Project: 19-666 - PGCPS Woodmore ES

Phone: (202) 368-1376
Fax:
Collected: 06/13/2019
Received: 06/14/2019
Analyzed: 06/15/2019

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	191906876-0001			191906876-0002			191906876-0003		
Client Sample ID:	19-666-06-13-01			19-666-06-13-02			19-666-06-13-03		
Volume (L):	75						75		
Sample Location	Outside			Blank			Room 2		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	79	3200	13.5	-	-	-	6	200	10.2
Aspergillus/Penicillium	-	-	-	-	-	-	19	780	39.8
Basidiospores	488	20000	84.4	-	-	-	19	780	39.8
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	12	490	2.1	-	-	-	5	200	10.2
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Total Fungi	**579**	**23690**	**100**	**-**	**None Detect**	**-**	**49**	**1960**	**100**
Hyphal Fragment	-	-	-	-	-	-	3	100	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	1*	10*	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	41	-	-	0	-	-	41	-
Analyt. Sensitivity 300x	-	13*	-	-	0*	-	-	13*	-
Skin Fragments (1-4)	-	1	-	-	-	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	-	-	-	1	-
Background (1-5)	-	2	-	-	-	-	-	3	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

Stefanie Schneider

Stefanie Schneider, Microbiology Laboratory Manager
or other approved signatory

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. 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. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Beltsville, MD AIHA-LAP, LLC --EMLAP Accredted #102891

Initial report from: 06/17/2019 11:13:43

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

OrderID: 191906876

Microbiology Chain of Custody

EMSL ANALYTICAL, INC.
LABORATORY · PRODUCTS · TRAINING

EMSL Order Number (*Lab Use Only*): 191906876

PHONE.
FAX.

Company Name: ATI, Inc	**EMSL-Bill to:** ☐ Same ☐ Different If Bill to is Different note instructions in Comments**
Street: 4221 Forbes Blvd., Suite 250	*Third Party Billing requires written authorization from third party*
City: Lanham **State/Province:** MD	**Zip/Postal Code:** 20706 **Country:**
Report To (Name): Brian Chapman	**Telephone #:**
Email Address: Brian@atiinc.com & Courtney@atiinc.com	**Fax #:** **Purchase Order:**
Project Name/Number: 19-666 – PGCPS Woodmore ES	**Please Provide Results:** ☐ Fax ☒ Email

U.S. State Samples Taken: Washington, DC **Zip Code Sample Taken:** 20585 **Connecticut Samples:** ■ Commercial ☐ Residential

**Analysis completed in accordance with EMSL's Terms and Conditions located in the Analytical Price Guide TATs are subject to methodology requirements*

Sterile, Sodium Thiosulfate Preserved Bottle Used: ☐ **Biocide Used in Source (specify):** ☐

Public Water Supply Samples: ☐ **Note: All results may automatically be reported to DOH if required by state.**

Turnaround Time (TAT) Options * - Please Check

☐ 3 Hour	☐ 6 Hour	☐ 24 Hour	☐ 48 Hour	☐ 72 Hour	☒ 96 Hour	☐ 1 Week	☐ 2 Week

Microbiology Test Codes

M001 Air-O-Cell
M030 Micro 5
M174 MoldSnap
M032 Allergenco-D

M041 Fungal Direct Examination
M168 Pollen ID & Enumeration
M280 Dust Characterization Level-1
M281 Dust Characterization Level-2
M005 Viable Fungi- Air Samples (Genus ID & Count)
M006 Viable Fungi- Air Samples (Includes *Penicillium, Aspergillus, Cladosporium, Stachybotrys* Species ID & Count)
M007 Culturable fungi - Surface Samples (Genus ID & Count)
M008 Culturable fungi - Surface Samples (Includes *Penicillium, Aspergillus, Cladosporium, Stachybotrys* Species ID & Count)
M009 Bacteria Culture Gram Stain & Count
M010 Bacteria Count & ID - 3 Most Prominent
M011 Bacteria Count & ID - 5 Most Prominent
M012 Pseudomonas aeruginosa (P/A***)

M024 Pseudomonas aeruginosa (MFT*)
M015 Heterotrophic Plate Count
M017 Total Coliform & E. coli (Colilert P/A***)
M018 Total Coliform & E. coli (MFT*)
M114 Total Coliform & E. coli Enumeration (Colilert MPN**)
M019 Fecal Coliform (MFT*)
M020 Fecal Streptococcus (MFT*)
M029 Enterococci (MFT*)
M129 Enterococci (Enterolert P/A***)
M180 Real Time qPCR-ERMI 36 Panel
M025 Sewage Screen –Water (MFT*)

M115 Sewage Screen - Water (P/A***)
M116 Sewage Screen - Water (MPN**)
M117 Sewage Screen - Swab (P/A***)
M013 Sewage Screen - Swab (MFT*)
M133 Methicillin-resistant Staph. aureus (MRSA)
M031 Rapid-growing non-TB Mycobacteria Detection & Enumeration
M014 Endotoxin Analysis
M044 Group Allergen (Cat, Dog, Cockroach, Dust Mite)
Other See Analytical Price Guide
Legionella Analysis Please use EMSL Legionella COC

*MFT= Membrane Filtration Technique
**MPN= Most Probable Number
***P/A= Presence/Absence

Name of Sampler: Brian Chapman **Signature of Sampler:**

Sample #	Sample Location/Description	Sample Type	Potable/ NonPotable (only for waters)	Test Code	Volume/ Area	Date/Time Collected	Temperature (°C) (*Lab Use Only*)
Example A1	Kitchen Sink/Tap	Water	☒ P ☐ NP	M017	100 mL	9/1/13 4:00 PM	
19-666-06-13-01	Outside	Air	☐ P ☐ NP	M001	75L	06-13-19	
19-666-06-13-02	Blank	Air	☐ P ☐ NP	M001	N/A	06-13-19	
19-666-06-13-03	ROOM 2	Air	☐ P ☐ NP	M001	75L	06-13-19	
		Air	☐ P ☐ NP	M001			
		Air	☐ P ☐ NP	M005			
		Air	☐ P ☐ NP	M001			

Client Sample # (s): 3 **Total # of Samples:** 3 **Samples Received Chilled?** Yes / No

Relinquished (Client): **Date:** 06-13-19 **Time:**

Received (Lab): [signature] **Date:** 6/13/19 **Time:** 4:30pm

Comments/Special Instructions:

M005= MEA = 141.50Litres
M010=TSA = 141.50Litres
M001=Trap = 75Litres

Page 1 of 1 pages

EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514

Tel/Fax: (516) 997-7251 / (516) 997-7528

http://www.EMSL.com / carleplacelab@emsl.com

EMSL Order: 061909657
Customer ID: ATII25A
Customer PO:
Project ID:

Attn: Brian Chapman
ATI
4221 Forbes Blvd
Suite 250
Lanham, MD 20706
Project: 19-666- PGCPS - Woodmore ES

Phone: (202) 368-1376
Fax:
Collected: 05/16/2019
Received: 05/16/2019
Analyzed: 05/22/2019

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	061909657-0001			061909657-0002			061909657-0003		
Client Sample ID:	19-666-01			16-666-02			16-666-03		
Volume (L):	75						75		
Sample Location	Outside Parking Lot			Field Blank			Main Office		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	58	2500	26.8	-	-	-	3	100	3.6
Aspergillus/Penicillium	-	-	-	-	-	-	5	200	7.1
Basidiospores	126	5500	58.9	-	-	-	55	2400	85.4
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	30	1300	13.9	-	-	-	2	90	3.2
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	1*	10*	0.4
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	1*	10*	0.4
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Polythrincium	1	40	0.4	-	-	-	-	-	-
Total Fungi	**215**	**9340**	**100**	**-**	**No Trace**	**-**	**67**	**2810**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	1	40	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	0	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	0*	-	-	13*	-
Skin Fragments (1-4)	-	1	-	-	-	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	-	-	-	1	-
Background (1-5)	-	1	-	-	-	-	-	2	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

Jeffrey Lau, Microbiology Laboratory Manager
or other approved signatory

Initial report from: 05/23/2019 14:18:56

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

EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514

Tel/Fax: (516) 997-7251 / (516) 997-7528

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EMSL Order: 061909657
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Attn: Brian Chapman
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Project: 19-666- PGCPS - Woodmore ES

Phone: (202) 368-1376
Fax:
Collected: 05/16/2019
Received: 05/16/2019
Analyzed: 05/22/2019

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	061909657-0004			061909657-0005			061909657-0006		
Client Sample ID:	16-666-04			16-666-05			16-666-06		
Volume (L):	75			75			75		
Sample Location	Library			Room 30			Room 11		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria (Ulocladium)	1*	10*	0.2	-	-	-	1	40	1.1
Ascospores	18	790	16.1	10	440	7.4	7	300	8.4
Aspergillus/Penicillium	2	90	1.8	-	-	-	3	100	2.8
Basidiospores	85	3700	75.4	124	5410	91.2	70	3100	86.6
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	6	300	6.1	1	40	0.7	1*	10*	0.3
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	1*	10*	0.2	2*	30*	0.5	1*	10*	0.3
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1*	10*	0.2	-	-	-	1*	10*	0.3
Pithomyces++	-	-	-	1*	10*	0.2	1*	10*	0.3
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Polythrincium	-	-	-	-	-	-	-	-	-
Total Fungi	**114**	**4910**	**100**	**138**	**5930**	**100**	**85**	**3580**	**100**
Hyphal Fragment	1	40	-	1	40	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	3	-	-	3	-
Fibrous Particulate (1-4)	-	2	-	-	2	-	-	2	-
Background (1-5)	-	2	-	-	2	-	-	3	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

Jeffrey Lau, Microbiology Laboratory Manager
or other approved signatory

Initial report from: 05/23/2019 14:18:56

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

EMSL Analytical, Inc.

528 Mineola Avenue Carle Place, NY 11514

Tel/Fax: (516) 997-7251 / (516) 997-7528

http://www.EMSL.com / carleplacelab@emsl.com

EMSL Order: 061909657
Customer ID: ATII25A
Customer PO:
Project ID:

Attn: Brian Chapman
ATI
4221 Forbes Blvd
Suite 250
Lanham, MD 20706
Project: 19-666- PGCPS - Woodmore ES

Phone: (202) 368-1376
Fax:
Collected: 05/16/2019
Received: 05/16/2019
Analyzed: 05/22/2019

Test Report: Air-O-Cell(™) Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number:	**061909657-0007**		
Client Sample ID:	**16-666-07**		
Volume (L):	**75**		
Sample Location	**Room 2**		

Spore Types	Raw Count	Count/m³	% of Total
Alternaria (Ulocladium)	-	-	-
Ascospores	1	40	0.9
Aspergillus/Penicillium	82	3600	77.1
Basidiospores	19	830	17.8
Bipolaris++	-	-	-
Chaetomium	-	-	-
Cladosporium	4	200	4.3
Curvularia	-	-	-
Epicoccum	-	-	-
Fusarium	-	-	-
Ganoderma	-	-	-
Myxomycetes++	-	-	-
Pithomyces++	-	-	-
Rust	-	-	-
Scopulariopsis/Microascus	-	-	-
Stachybotrys/Memnoniella	-	-	-
Unidentifiable Spores	-	-	-
Zygomycetes	-	-	-
Polythrincium	-	-	-
Total Fungi	**106**	**4670**	**100**
Hyphal Fragment	1	40	-
Insect Fragment	-	-	-
Pollen	-	-	-
Analyt. Sensitivity 600x	-	44	-
Analyt. Sensitivity 300x	-	13*	-
Skin Fragments (1-4)	-	1	-
Fibrous Particulate (1-4)	-	1	-
Background (1-5)	-	2	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

Jeffrey Lau, Microbiology Laboratory Manager
or other approved signatory

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. 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. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Carle Place, NY AIHA-LAP, LLC--EMLAP Accredited #102344

Initial report from: 05/23/2019 14:18:56

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

OrderID: 061909657

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Microbiology Chain of Custody

EMSL Order Number (*Lab Use Only*): 061909657

EMSL ANALYTICAL, INC.
200 ROUTE 130 NORTH
CINNAMINSON, NJ 08077
PHONE: (800) 220-3675
FAX:(856) 786-0262

Company Name: ATI, Inc	**EMSL-Bill to:** ☐ Same ☐ Different If Bill to is Different note instructions in Comments
Street: 4221 Rumsey Road, Suite 250	*Third Party Billing requires written authorization from third party.*
City: Lanham **State/Province:** MD	**Zip/Postal Code:** 20706 **Country:**
Report To (Name): Brian Chapman / Mikal Frater	**Telephone #:** 202-558-7489
Email Address: Brian@atiin.com & Mikal@atiinc.com	**Fax #:** **Purchase Order:**
Project Name/Number: 19-666- PGCPS - Woodmore ES	**Please Provide Results:** ☐ Fax ■ Email
U.S. State Samples Taken: **Project Zip Code:**	**Connecticut Samples:** ■ Commercial ☐ Residential

Sterile, Sodium Thiosulfate Preserved Bottle Used: ☐ **Biocide Used in Source (specify):** ☐

Public Water Supply Samples: ☐ **Note: All results may automatically be reported to DOH if required by state.**

Turnaround Time (TAT) Options - Please Check

☐ 3 Hour	☐ 6 Hour	☐ 24 Hour	☐ 48 Hour	☐ 72 Hour	☐ 96 Hour	■ 1 Week	☐ 2 Week

Microbiology Test Codes

M001 Air-O-Cell
M174 MoldSnap
M030 Micro 5
M032 Allergenco-D
M041 Fungal Direct Examination
M169 Pollen ID & Enumeration
M280 Dust Characterization Level-1
M281 Dust Characterization Level-2
M005 Viable Fungi- Air Samples (Genus ID & Count)
M006 Viable Fungi- Air Samples (Includes *Penicillium, Aspergillus, Cladosporium, Stachybotrys* Species ID & Count)
M007 Culturable fungi - Surface Samples (Genus ID & Count)
M008 Culturable fungi - Surface Samples (Includes *Penicillium, Aspergillus, Cladosporium, Stachybotrys* Species ID & Count)
M009 Bacteria Culture Gram Stain & Count
M010 Bacteria Count & ID - 3 Most Prominent
M011 Bacteria Count & ID - 5 Most Prominent

M012 *Pseudomonas aeruginosa* (P/A***)
M024 *Pseudomonas aeruginosa* (MFT*)
M015 Heterotrophic Plate Count
M017 Total Coliform & *E. coli* (Colilert P/A***)
M018 Total Coliform & *E. coli* (MFT*)
M114 Total Coliform & *E. coli* Enumeration (Colilert MPN**)
M019 Fecal Coliform (MFT*)
M020 Fecal *Streptococcus* (MFT*)
M029 *Enterococci* (MFT*)
M129 *Enterococci* (Enterolert P/A***)
M180 Real Time qPCR-ERMI 36 Panel
M025 Sewage Screen –Water (MFT*)

M115 Sewage Screen - Water (P/A***)
M116 Sewage Screen - Water (MPN**)
M117 Sewage Screen - Swab (P/A***)
M013 Sewage Screen - Swab (MFT*)
M133 *Methicillin-resistant Staph. aureus* (MRSA)
M031 Rapid-growing non-TB *Mycobacteria* Detection & Enumeration
M014 Endotoxin Analysis
M044 Group Allergen (Cat, Dog, Cockroach, Dust Mite)
Other See Analytical Price Guide
***Legionella* Analysis** Please use EMSL *Legionella* COC

*MFT= Membrane Filtration Technique
**MPN= Most Probable Number
***P/A= Presence/Absence

Name of Sampler: Mikal Frater **Signature of Sampler:** Mikal Frater

Sample #	Sample Location/Description	Sample Type	Potable/ NonPotable (Only for Waters)	Test Code	Volume/ Area	Date/Time Collected	Temperature (°C) (Lab Use Only)
Example A1	Kitchen Sink/Tap	Water	☒ P ☐ NP	M017	100 mL	9/1/13 4:00 PM	
19-666-01	Outside Parking Lot	Air	☐ P ☐ NP	M001	75L	05-16-19 - 10:34	
19-666-02	Field Blank	Air	☐ P ☐ NP	M001	75L	05-16-19 -	
19-666-03	Main Office	Air	☐ P ☐ NP	M001	75L	05-16-19 - 10:52	
19-666-04	Library	Air	☐ P ☐ NP	M001	75L	05-16-19 - 11:01	
19-666-05	Room 30	Air	☐ P ☐ NP	M001	75L	05-16-19 - 11:18	

Client Sample # (s): - 7 **Total # of Samples:** 7 **Samples Received Chilled?** (Lab Use Only) Yes / No

Relinquished (Client): **Date:** 5-16-19 **Time:**

Received (Lab): [signature] **Date:** 5/16/19 **Time:** 3:57 pm

MAY 22 AM 9:44

Comments/Special Instructions:

5/22/19

OrderID: 061909657

Microbiology Chain of Custody

EMSL Order Number *(Lab Use Only)*:

061909657

EMSL ANALYTICAL, INC.
200 ROUTE 130 NORTH
CINNAMINSON, NJ 08077
PHONE: (800) 220-3675
FAX:(856) 786-0262

Additional pages of the chain of custody are only necessary if needed for additional sample information.

Sample #	Sample Location/Description	Sample Type	Potable/ NonPotable (Only for Waters)	Test Code	Volume/ Area	Date/Time Collected	Temperature (°C) (Lab Use Only)
19-666-06	Room 11	Air	☐ P ☐ NP	M001	75L	05-16-19 - 11:24	
19-666-07	Room 2	Air	☐ P ☐ NP	M001	75L	05-16-19- 11:33	
			☐ P ☐ NP	(w)			
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
			☐ P ☐ NP				
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			☐ P ☐ NP				
			☐ P ☐ NP				

Comments/Special Instructions:

Page 2 of 2

Controlled Document – COC-34 Micro R8 11/14/2017

5/22/19

Appendix B:
Instrument Calibration Records

Certificate of Calibration

(✓) Buck™ BioAire Pump Calibration Rotameter

( ) Buck™ BioSlide Pump Calibration Rotameter

Serial number: R14057

Date Calibrated: 1/22/19 **Calibration Due Date:** 1/22/20

Flow Calibration

This is to certify that the rotameter listed above has been calibrated using a Buck Primary calibrator listed below which is calibrated according to A.P. Buck, Inc. calibration procedure APB-1, Ver. 6.2 and is traceable to the National Institute of Standards & Technology (N.I.S.T). A.P. Buck guarantees the accuracy of the rotameter to be within ± 5% of the actual flow rate.

AMBIENT CONDITIONS: Temperature 74±3° F Relative Humidity 50±10%

Description	MFR.	Model	Serial #
Primary Calibrator	A.P. Buck Inc.	M30B	☐ A40020 ☑ A40021

QA Approval By:

A.P. BUCK, INC.
7101 Presidents Drive, Suite 110
Orlando, FL 32809
Phone: 407-851-8602
Fax: 407-851-8910

BUCK
A.P. BUCK, INC.

CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

ENVIRONMENT CONDITIONS		
TEMPERATURE	75.9 (24.4)	°F (°C)
RELATIVE HUMIDITY	34	%RH
BAROMETRIC PRESSURE	29.08 (984.8)	inHg (hPa)

MODEL	982
SERIAL NUMBER	P17100007

☒ AS LEFT ☒ IN TOLERANCE
☐ AS FOUND ☐ OUT OF TOLERANCE

– CALIBRATION VERIFICATION RESULTS –

TEMPERATURE VERIFICATION — SYSTEM T-101 — *Unit: °F (°C)*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	32.0 (0.0)	31.6 (−0.2)	31.0~33.0 (−0.6~0.6)	2	140.0 (60.0)	140.4 (60.2)	139.0~141.0 (59.4~60.6)

HUMIDITY VERIFICATION — SYSTEM H-120 — *Unit: %RH*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	10.0	9.8	7.8~12.2	4	70.0	70.0	67.8~72.2
2	30.0	30.6	27.8~32.2	5	90.0	89.6	87.8~92.2
3	50.0	50.4	47.8~52.2				

CO_2 GAS VERIFICATION — SYSTEM G-101 — *Unit: ppm*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	0	0	0~50	4	3000	3005	2910~3090
2	500	487	450~550	5	5042	5034	4891~5193
3	1000	1000	950~1050				

CO GAS VERIFICATION — SYSTEM G-101 — *Unit: ppm*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	35	35	32~38	2	100	99	97~103

TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to the United States National Institute of Standards and Technology (NIST) or has been verified with respect to instrumentation whose accuracy is traceable to NIST, or is derived from accepted values of physical constants. TSI's calibration system is registered to ISO-9001:2015.

Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E003986	02-12-19	08-31-19
Humidity	E002008	01-25-19	07-31-19
200 CO	CC15018	04-15-19	04-12-22
Air	GT-0540	01-19-19	01-18-22
Flow	E003978	02-26-19	02-29-20
Flow	E003501	09-04-18	09-30-19
100 C4H8	EB0100212	09-29-17	09-29-21

Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E003987	02-12-19	08-31-19
5000 CO_2	3341007	12-14-18	12-11-21
N2	UT-102	04-30-19	04-30-24
Flow	E003341	09-14-18	09-30-19
Flow	E003502	02-26-19	02-29-20
2000 C4H8	EB0081455	06-27-18	06-26-21

CALIBRATED

May 23, 2019
DATE

Doc. ID: CERT_GEN_WCC

TSI P/N 2300157

CERTIFICATE OF CALIBRATION AND TESTING

TSI Incorporated, 500 Cardigan Road, Shoreview, MN 55126 USA
Tel: 1-800-874-2811 1-651-490-2811 Fax: 1-651-490-3824 http://www.tsi.com

ENVIRONMENT CONDITIONS		
TEMPERATURE	75.5 (24.2)	°F (°C)
RELATIVE HUMIDITY	38	%RH
BAROMETRIC PRESSURE	28.66 (970.5)	inHg (hPa)

MODEL	7575-X
SERIAL NUMBER	7575X1711006

☐ AS LEFT ☒ IN TOLERANCE
☒ AS FOUND ☐ OUT OF TOLERANCE

– CALIBRATION VERIFICATION RESULTS –

THERMO COUPLE — **SYSTEM PRESSURE01-02** — *Unit: °F (°C)*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	73.5 (23.1)	73.1 (22.8)	71.5~75.5 (21.9~24.2)				

BAROMETRIC PRESSURE — **SYSTEM PRESSURE01-02** — *Unit: inHg (hPa)*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	28.67 (970.9)	28.65 (970.2)	28.10~29.24 (951.6~990.2)				

TSI does hereby certify that the above described instrument conforms to the original manufacturer's specification (not applicable to As Found data) and has been calibrated using standards whose accuracies are traceable to the United States National Institute of Standards and Technology (NIST) or has been verified with respect to instrumentation whose accuracy is traceable to NIST, or is derived from accepted values of physical constants. TSI's calibration system is registered to ISO-9001:2015.

Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E003170	02-21-19	02-29-20	Pressure	E005254	10-29-18	10-31-19
Pressure	E003982	02-07-19	08-31-19	DC Voltage	E003493	08-23-18	08-31-19

Sharol M^cElmury
VERIFIED

May 22, 2019
DATE

Doc ID: CERT_GEN_WCC

TSI P/N 2300157