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Architecture | Engineering | Construction

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March 3, 2021

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

RE: Indoor Air Quality Assessment, Buck Lodge Middle School
Purchase Order: 734977
ATI Project Number: 20-708

Dear Mr. Baylor:

Prince George's County Public Schools requested that ATI, Inc., conduct a proactive indoor air quality (IAQ) assessment at Buck Lodge Middle School on December 9, 2020 and a follow-up assessment on March 1, 2021. The assessments' key findings are enclosed in the Executive Summary on page three, and the official laboratory reports for total fungal spore trap sampling are 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.

Reviewed By:

Mikal Frater
Industrial Hygienist

Nate Burgei, CIH, CSP
Certified Industrial Hygienist

Indoor Air Quality Assessment Report

Prince George's County Public Schools
Buck Lodge Middle School
2611 Buck Lodge Road
Adelphi, MD 20783

Prepared for:

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

March 3, 2021

Submitted by:

ATI Job # 20-708

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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
RH	Relative Humidity
Rev.	Revision

Abbreviations involving scientific volume and measurements involving media or water sampling

Spores/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

ATI conducted a proactive Indoor Air Quality (IAQ) assessment on December 9, 2020, at Buck Lodge Middle School, located at 2611 Buck Lodge Road, in Adelphi, Maryland, and a follow-up assessment on March 1, 2021 in select rooms that had unusual results in the initial inspection.

The initial assessment on December 9, 2020 included a visual assessment of randomly selected classrooms and other frequently occupied spaces, such as the cafeteria/gym, the main office, and randomly selected classrooms, for potential IAQ contributors and pathways. Room 102 had unusual fungal spore concentrations during the initial assessment and was selected for a follow-up assessment on March 1, 2021 after actions were taken to reduce the presence of mold and repair any water issues discovered in and around Room 102. As part of both assessments, ATI measured common IAQ comfort parameters, including temperature, relative humidity, carbon dioxide, and carbon monoxide. Also, ATI collected total fungal air samples on spore trap cassettes for microbiological analysis.

The following is a summary of the key findings from these assessments:

1. Two of the tested spaces on December 9, 2020 had a temperature greater than the ASHRAE recommended winter range of 68-75°F. Room 102 had an average temperature on March 1, 2021 within the ASHRAE recommended winter range.
2. The relative humidity in all tested spaces during both assessments was less than the ASHRAE guidelines of ≤ 65%, but also less than 30%, which can cause occupant discomfort.
3. Carbon dioxide concentrations in all tested spaces during both assessments were less than the ASHRAE limit for carbon dioxide for each day of the assessments.
4. Carbon monoxide concentrations during both assessments were less than the IAQ meter's detection limit throughout the tested spaces.
5. Room 102 had an *Aspergillus/Penicillium*-like spore concentration of 185,640 spores/m^3 on December 9, 2020, which suggests indoor mold growth, either currently or sometime in the past, in Room 102 or in the surrounding area. All other tested spaces had mold spore concentrations less than or similar to the outdoor spore concentration.
6. The *Aspergillus/Penicillium*-like spore concentration was reassessed in Room 102 on March 1, 2021, and the *Aspergillus/Penicillium*-like spore concentration was 159 spores/m^3, which is a reduction of more than 99%. The results suggest the actions taken to reduce the airborne mold spore concentrations were successful and ATI has no further recommendations.

2 Assessment Methods

Mikal Frater, IH of ATI, Inc. conducted the initial visual assessment and air sampling on December 9, 2020. Sampled rooms were randomly selected and accounted for approximately 10% of classrooms or a minimum of five samples. Ms. Frater documented visual observations at the time she collected the air samples. Sama Wanigasundara, Industrial Hygienist, conducted a follow-up inspection on March 1, 2021 in Room 102 after the areas were treated for mold presence. 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 a typical adult 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 measured with a calibrated TSI Q-Trak 7575-X Meter and attached 982 Probe.

Total fungal air samples were collected with a field calibrated 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. AMA Analytical Services, Inc. of Lanham, MD analyzed the samples using direct microscopic examination per ASTM D7391, which spores both viable and non-viable mold spores and particulates, which combined yields total fungal results. AMA participates in the National Institute of Standards and Technology's (NIST) National Voluntary Laboratory Accreditation Program (NVLAP) for general laboratory performance and management, and the American Industrial Hygiene Association (AIHA) for Environmental Microbial Laboratory Accreditation Program (EMLAP). The AMA laboratory reports are included in Appendix A.

3 Visual Observations

Table 1 lists the areas, conditions, observations, and other pertinent details related to the initial and follow-up IAQ assessments. On both dates of sampling, few occupants were present in the school because of the COVID-19 global pandemic.

Table 1: Visual Observations and Sampling Locations

Sample Location	December 9, 2020 Observations
Outdoors – Parking Lot	• Light foot/vehicle traffic • Cloudy skies
Main Office	• Three occupants during assessment • Light foot traffic • Door to corridor open at time of assessment, doors to adjoining rooms open • One ceiling tile missing behind desk • One air supplier in the form of a wall unit • No stained ceiling tile, visible growth, or odor observed • Space is approximately 630 ft.^{2}
Cafeteria	• Six occupants at time off assessment • No stained ceiling tiles or observed mold growth • Smell of food being cooked from the kitchen • Space is approximately 6,139 ft.^{2}
Room 401	• One occupant at time of assessment • No stained ceiling tile, visible growth, or odor observed • Doors to adjoining rooms closed • Two air suppliers • Space is approximately 720 ft.^{2}
Room 710	• One occupant at time of assessment • One air supplier in the form of a wall unit – off during assessment • No stained ceiling tile, visible growth, or odor observed • Space is approximately 912 ft.^{2}
Media Center	• Two occupants at time of assessment • No stained ceiling tiles, observed odor or visible growth • Six air suppliers, four air returns • Dirt/debris coming from emergency exit (outdoor access) • Doors to corridor and adjoining rooms open at time of assessment • Light foot traffic • Space is approximately 5,526 ft.^{2}
Room 701	• One occupant at time of assessment

Sample Location	December 9, 2020 Observations
	• Two air suppliers in the form of a wall units, one air return • No stained ceiling tiles, observed odor or visible growth
Room 102	• One occupant at time of assessment • No stained ceiling tiles, observed odor or visible growth • One air supplier in the form of a wall unit, one air return • Space is approximately 748 ft.^{2}
Sample Location	**March 1, 2020 Reassessment Observations**
Room 102	• No occupants at time of sampling. • No stained ceiling tiles • No observed odor or visible mold growth • Two wall units, one air return • No dust on floor and furniture • Space is approximately 748 ft.^{2}
Outdoors	• Mostly cloudy and rainy • Parking lot was mostly empty • There were trees around parking lot

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 80% of 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 temperatures measured during the December 9, 2020 initial assessment and reassessment from March 1, 2021 are summarized in Table 2. As indicated by the data in the table, temperatures in the school on December 9 averaged between 68°F and 77°F, with two tested locations measuring greater than the ASHRAE recommended winter range.

On March 1, 2021, ATI reassessed Room 102 which previously had unusual fungal spore concentrations after remediation actions were completed. ATI also reassessed the temperature in Room 102 and the temperature in Room 102 was within the ASHRAE recommended winter range.

Table 2: Temperature

Sample Location	12/9/2020 Initial Assessment Temperature in °F			ASHRAE Standard °F
	Min	Max	Average	
Outdoors	38	42	40	N/A
Indoors				
Main Office	69	70	70	68°F - 75°F
Cafeteria	72	72	72	68°F - 75°F
Room 401	67	68	68	68°F - 75°F
Room 710	71	71	71	68°F - 75°F
Media Center	77	77	77	68°F - 75°F
Room 701	75	76	76	68°F - 75°F
Room 102	71	72	72	68°F - 75°F
3/1/2021 Reassessment Temperature in °F				
Outdoors	60	61	61	N/A
Indoors				
Room 102	70	71	71	68°F - 75°F

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 greater than 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 less than 30% may result in drying of occupants' mucous membranes and skin. Relative humidity measurements for December 9, 2020 and March 1, 2021 are summarized in Table 3. As indicated by the data in the table, the average relative humidity ranged between 13% and 20% with all tested locations measuring less than the ASHRAE maximum recommendation of 65% relative humidity, and also less than 30% relative humidity.

On March 1, 2021, ATI reassessed Room 102 which previously had unusual fungal spore concentrations after remediation actions were completed. ATI also reassessed the relative humidity in the space on March 1, 2021 and the average relative humidity was 29%, which is less than 65%, but also just less than 30%.

Table 3: Relative Humidity

Sample Location	12/9/2020 Initial Assessment (% RH)			ASHRAE Standard (% RH)
	Min	Max	Average	
Outdoors	31	46	39	N/A
Indoors				
Main Office	19	20	20	≤ 65
Cafeteria	15	15	15	≤ 65
Room 401	19	20	20	≤ 65
Room 710	16	17	17	≤ 65
Media Center	18	19	19	≤ 65
Room 701	13	13	13	≤ 65
Room 102	17	17	17	≤ 65

Sample Location	12/9/2020 Initial Assessment (% RH)			ASHRAE Standard (% RH)
	Min	Max	Average	
3/1/2021 Reassessment Relative Humidity (%RH)				
Outdoors	51	52	52	N/A
Indoors				
Room 102	29	29	29	≤ 65

4.3 Carbon Dioxide

Carbon dioxide concentrations 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 can maintain indoor carbon dioxide concentrations less than 700 parts per million (ppm) greater than the outdoor air concentration. Typically, outdoor carbon dioxide concentrations range from 300 ppm to 450 ppm, with the higher range typically found in urban areas during peak rush hour.

Carbon dioxide concentrations for December 9, 2020 are summarized in Table 4. On the day of the assessment, the average outdoor carbon dioxide concentration was 382 ppm, which calculates to a maximum indoor concentration of 1,082 ppm (700 + 382). All tested locations indoors were less than the recommended maximum for the day of the assessment.

On March 1, 2021, ATI reassessed Room 102 which previously had unusual fungal spore concentrations after remediation actions were completed. The carbon dioxide concentrations measured during the reassessment are included in Table 4. The average outdoor carbon dioxide concentration on March 1, 2021 was 468 ppm, which calculates to a maximum indoor concentration of 1,168 ppm (700 + 468). The carbon dioxide concentration in Room 102 was 502 ppm, which is less than the ASHRAE calculated maximum of 1,168 ppm for the day of the assessment.

Table 4: Carbon Dioxide

Sample Location	12/9/2020 Initial Assessment Concentration (parts per million)			ASHRAE Standard (ppm) NTE
	Min	Max	Average	
Outdoors	358	406	382	N/A
Indoors				
Main Office	508	510	509	< 1,082
Cafeteria	489	490	490	< 1,082
Room 401	390	405	398	< 1,082
Room 710	398	390	390	< 1,082
Media Center	426	438	432	< 1,082
Room 701	381	388	385	< 1,082
Room 102	370	378	374	< 1,082
3/1/2021 Reassessment				

Concentration (parts per million)				
Outdoors	467	469	468	N/A
Indoors				
Room 102	501	502	502	< 1,168

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 over an eight-hour time-weighted average. ATI measured carbon monoxide concentrations using a TSI Q-Trak model number 7575-X with an attached IAQ probe (model number 982). The instrument's carbon monoxide sensor has an error range of ± 3% of the reading or three (3) ppm, whichever is greater. As indicated by the data in Table 5, carbon monoxide concentrations for all tested locations on December 9, 2020 were less than the Q-Trak's detection limit throughout the school.

On March 1, 2021, ATI reassessed Room 102 which previously had unusual fungal spore concentrations after remediation actions were completed. The carbon monoxide concentrations measured during the reassessment are included in Table 5. The carbon monoxide concentration in Room 102 was less than the Q-Trak's limit of detection and less than the EPA/ASHRAE recommended maximum of 9 ppm.

Table 5: Carbon Monoxide

Sample Location	12/9/2020 Initial Assessment Concentration (parts per million)			ASHRAE Standard (ppm)
	Min	Max	Average	
Outdoors	< 3	< 3	< 3	N/A
Indoors				
Main Office	< 3	< 3	< 3	< 9
Cafeteria	< 3	< 3	< 3	< 9
Room 401	< 3	< 3	< 3	< 9
Room 710	< 3	< 3	< 3	< 9
Media Center	< 3	< 3	< 3	< 9
Room 701	< 3	< 3	< 3	< 9
Room 102	< 3	< 3	< 3	< 9
3/1/2021 Reassessment Concentration (parts per million)				
Outdoors	< 3	< 3	< 3	N/A
Indoors				
Room 102	< 3	< 3	< 3	< 9

5 Total Fungal Air Sampling Results

Mold is carried indoors through building entrances, open windows, loading docks, foot traffic into buildings, and the HVAC system. To thrive indoors, mold requires a food source, proper temperature and humidity to foster its growth.

The December 9, 2020 and March 1, 2021 mold assessments sampled air using spore trap cassettes in randomly selected classrooms and other areas throughout the facility. 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 results from December 9, 2020 suggested unusual mold spore concentrations in Room 102. The total ambient, outdoor spore concentration was 936 spores/m^3, with an *Aspergillus/Penicillium*-like spore concentration of 156 spores/m^3. Room 102 had a total spore concentration of 185,744 spores/m^3, with *Aspergillus/Penicillium*-like spores being the predominant spores present at 185,640 spores/m^3, which makes up 99.8% of the spore types identified. The spore concentration in Room 102 was significantly greater than the concentration measured in most typical occupied spaces and suggests either present or past indoor mold amplification due to a water leak or moisture intrusion. ATI recommended evaluating Room 102 and the surrounding areas to try and identify water sources, abate any mold issues and clean the area before retesting the space.

The fungal spore concentrations in the Main Office and Media Center were greater than the outdoor total spore concentration and slightly greater than the typical indoor mold concentrations of around 1,000 spores/m^3 or less; however, the mold spore types identified and the ratios were similar to the types and ratios measured outdoors. This suggests the mold measured in these spaces likely originated from the outdoors and does not suggest indoor mold growth.

Room 102 was reassessed on March 1, 2021 after the initial assessment indicated the unusual presence of airborne mold spores. The *Aspergillus/Penicillium*-like spore concentration in Room 102 on March 1, 2021 was 159 spores/m^3, which was similar to the outdoor *Aspergillus/Penicillium*-like spore concentration of 106 spores/m^3. The reduction in *Aspergillus/Penicillium*-like spore concentration was greater than 99%, suggesting the actions taken to reduce the airborne mold spores in Room 102 was effective. Differences in concentrations between both dates of assessment are summarized in Table 6.

Table 6: *Aspergillus/Penicillium*-like Concentration Comparison

Sample Location	December 9, 2020 Concentrations	March 1, 2021 Concentrations	% Change
Room 102	185,640	159	- 99%

The official laboratory reports with spore trap samples collected on December 9, 2020 and March 1, 2021 are presented in Appendix A.

6 Summary of Findings

1. Two of the tested spaces on December 9, 2020 had a temperature greater than the ASHRAE recommended winter range of 68-75°F. Room 102 had an average temperature on March 1, 2021 within the ASHRAE recommended winter range.
2. The relative humidity in all tested spaces during both assessments was less than the ASHRAE guidelines of ≤ 65%, but also less than 30%, which can cause occupant discomfort.
3. Carbon dioxide concentrations in all tested spaces during both assessments were less than the ASHRAE limit for carbon dioxide for each day of the assessments.
4. Carbon monoxide concentrations during both assessments were less than the IAQ meter's detection limit throughout the tested spaces.

5. Room 102 had an *Aspergillus/Penicillium*-like spore concentration of 185,640 spores/m^3 on December 9, 2020, which suggests indoor mold growth, either currently or sometime in the past, in Room 102 or in the surrounding area. All other tested spaces had mold spore concentrations less than or similar to the outdoor spore concentration.
6. The *Aspergillus/Penicillium*-like spore concentration was reassessed in Room 102 on March 1, 2021, and the *Aspergillus/Penicillium*-like spore concentration was 159 spores/m^3, which is a reduction of more than 99%. The results suggest the actions taken to reduce the airborne mold spore concentrations were successful and ATI has no further recommendations.

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

Best,
ATI, INC.

Mikal Frater
Industrial Hygienist

Appendix A: Laboratory Report and Chain of Custody

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody: 285302
Client: ATI, Inc.
Address: 9220 Rumsey Road
Suite 100
Columbia, MD 21045
Attention: Mikal Frater

Job Name: Buck Lodge Middle School
Job Location: 2611 Buck Lodge Road, Adelphi, MD 20783
Job Number: 20-708
P.O. Number: Not Provided

Date Submitted: 12/09/2020
Person Submitting: Mikal Frater
Date Analyzed: 12/11/2020
Report Date: 12/14/2020

AMA Sample #	285302-1
Client ID	20-708-1
Analyst ID	CD
Collection Apparatus	Air-O-Cell
Sample Volume (L)	75
Sample Condition	Acceptable
Debris Loading	2
Location	Outdoors - Parking Lot

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	1	15	52	52	5.6%
Basidiospores	4	15	52	208	22.2%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	10	15	52	520	55.6%
Curvularia					
Penicillium / Aspergillus	3	15	52	156	16.7%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					

Total Raw Ct: 18 **Total sp/m³:** 936

Comments

AMA Sample #	285302-2
Client ID	20-708-2
Analyst ID	CD
Collection Apparatus	Air-O-Cell
Sample Volume (L)	0
Sample Condition	Acceptable
Debris Loading	0
Location	Field Blank

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores					
Basidiospores					
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium					
Curvularia					
Penicillium / Aspergillus					
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					

Total Raw Ct: 0 **Total sp/m³:** 0

Comments
No Mold Spores Observed

AMA Sample #	285302-3
Client ID	20-708-3
Analyst ID	CD
Collection Apparatus	Air-O-Cell
Sample Volume (L)	75
Sample Condition	Acceptable
Debris Loading	1
Location	Main Office

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	6	15	52	312	30%
Basidiospores	4	15	52	208	20%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	3	15	52	156	15%
Curvularia					
Penicillium / Aspergillus	5	15	52	260	25%
Smuts/Periconia/Myxomycetes	2	15	52	104	10%
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					

Total Raw Ct: 20 **Total sp/m³:** 1040

Comments

AMA Analytical Services, Inc.
Focused On Results.

Lab ID # 100470

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	285302	**Job Name:**	Buck Lodge Middle School	**Date Submitted:**	12/09/2020
Client:	ATI, Inc.	**Job Location:**	2611 Buck Lodge Road, Adelphi, MD 20783	**Person Submitting:**	Mikal Frater
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-708	**Date Analyzed:**	12/11/2020
		P.O. Number:	Not Provided	**Report Date:**	12/14/2020
Attention:	Mikal Frater				

AMA Sample #	285302-4	**AMA Sample #**	285302-5	**AMA Sample #**	285302-6
Client ID	20-708-4	**Client ID**	20-708-5	**Client ID**	20-708-6
Analyst ID	CD	**Analyst ID**	CD	**Analyst ID**	CD
Collection Apparatus	Air-O-Cell	**Collection Apparatus**	Air-O-Cell	**Collection Apparatus**	Air-O-Cell
Sample Volume (L)	75	**Sample Volume (L)**	75	**Sample Volume (L)**	75
Sample Condition	Acceptable	**Sample Condition**	Acceptable	**Sample Condition**	Acceptable
Debris Loading	1	**Debris Loading**	1	**Debris Loading**	1
Location	Cafeteria	**Location**	Room 401	**Location**	Room 710

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	4	15	52	208	36.4%
Basidiospores	4	15	52	208	36.4%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium					
Curvularia					
Penicillium / Aspergillus	3	15	52	156	27.3%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	11	**Total sp/m³:**	572		

Comments

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	2	15	52	104	28.6%
Basidiospores	2	15	52	104	28.6%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	3	15	52	156	42.9%
Curvularia					
Penicillium / Aspergillus					
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	7	**Total sp/m³:**	364		

Comments

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	2	15	52	104	66.7%
Basidiospores	1	15	52	52	33.3%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium					
Curvularia					
Penicillium / Aspergillus					
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	3	**Total sp/m³:**	156		

Comments
Very Light Trace

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	285302	**Job Name:**	Buck Lodge Middle School	**Date Submitted:**	12/09/2020
Client:	ATI, Inc.	**Job Location:**	2611 Buck Lodge Road, Adelphi, MD 20783	**Person Submitting:**	Mikal Frater
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-708	**Date Analyzed:**	12/11/2020
		P.O. Number:	Not Provided	**Report Date:**	12/14/2020
Attention:	Mikal Frater				

AMA Sample #	285302-7	**AMA Sample #**	285302-8	**AMA Sample #**	285302-9
Client ID	20-708-7	**Client ID**	20-708-8	**Client ID**	20-708-9
Analyst ID	CD	**Analyst ID**	CD	**Analyst ID**	CD
Collection Apparatus	Air-O-Cell	**Collection Apparatus**	Air-O-Cell	**Collection Apparatus**	Air-O-Cell
Sample Volume (L)	75	**Sample Volume (L)**	75	**Sample Volume (L)**	75
Sample Condition	Acceptable	**Sample Condition**	Acceptable	**Sample Condition**	Acceptable
Debris Loading	2	**Debris Loading**	1	**Debris Loading**	2
Location	Media Center	**Location**	Room 701	**Location**	Room 102

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	2	15	52	104	6.1%
Basidiospores	13	15	52	676	39.4%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	10	15	52	520	30.3%
Curvularia					
Penicillium / Aspergillus	6	15	52	312	18.2%
Smuts/Periconia/Myxomycetes	2	15	52	104	6.1%
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*	1	15	52	52	3%
Total Raw Ct:	33		**Total sp/m³:**	1716	

Comments

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	3	15	52	156	37.5%
Basidiospores	3	15	52	156	37.5%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium					
Curvularia					
Penicillium / Aspergillus	2	15	52	104	25%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	8		**Total sp/m³:**	416	

Comments

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores					
Basidiospores	2	15	52	104	0.2%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium					
Curvularia					
Penicillium / Aspergillus	952	4	195	185640	99.8%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	954		**Total sp/m³:**	185744	

Comments

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	285302	**Job Name:**	Buck Lodge Middle School	**Date Submitted:**	12/09/2020
Client:	ATI, Inc.	**Job Location:**	2611 Buck Lodge Road, Adelphi, MD 20783	**Person Submitting:**	Mikal Frater
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-708	**Date Analyzed:**	12/11/2020
		P.O. Number:	Not Provided	**Report Date:**	12/14/2020
Attention:	Mikal Frater				

Spore Comparison Guide

The criteria for these specifications are outlined, but not limited to those listed, below. Final specifications may differ from the listed criteria for certain samples. AMA Analytical Services, Inc. reserves the right to make changes to these criteria at any time without notice.

Normal ecology	Slightly above normal ecology	Moderately above normal ecology	Substantially above normal ecology

Stachybotrys / Memnoniella, and Chaetomium	**Other Spores* (Control Present)**	**Other Spores* (No Control)**
1-4 Spores: Yellow 5-9 Spores: Orange 10+ Spores: Red	< 10 Spores: Insignificant (no color) <= Control's spore count: Green Between Control and 2x Control: Yellow Between 2x Control and 3x Control: Orange 3x+ Control: Red	< 10 Spores: Insignificant (no color) 10-20 Spores: Yellow 20-50 Spores: Orange 50+ Spores: Red

*No evalutation is provided for the following spore types: Other, Other Colorless, and Unknown Fungi, and Misc

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Attention:	Mikal Frater				

General Comments, Disclaimers, and Footnotes

Analytical Method: Sample are analyzed following the instructions and guidelines outlined in ASTM 7391-09.

Sample Condition: Acceptable: The sample was collected and delivered to the our location without disturbing the material on the sampling media.
Unacceptable: 1. The sample trace (TR) has been disturbed. 2. The sample was damaged or otherwise unsuitable for analysis.
0 = No particulate matter detected; 1= >nd-~5% Particulate Loading; 2 = ~5%-25% Particulate Loading; 3 = ~25%- 75% Particulate Loading; 4 = ~75%-90% Particulate Loading; 5 = >90% Particulate Loading

Spore Notes: Based on their small size and very few distinguishing characteristics, Aspergillus and Penicillium cannot be differentiated by non-viable sampling methods. There are other types of spores whose morphology is similar to Aspergillus and Penicillium and cannot be differentiated by non-viable sampling methods. Examples of these similar spores are Acremonium, Paecilomyces, Wallemia, Trichoderma, Scopulariopsis, and Gliocladium.
Smuts, Periconia and Myxomycetes are three different types of genera that have similar morphological characteristics.
Bipolaris/Dreschlera/Helm: Bipolaris / Dreschlera / Helminthosporium are three different types of genera that have smiliar morphological characteristics.
Other Colorless represents all colorless spores that are non-distinctive and unidentifiable.
*Hyphal Fragments: A portion of the mycelium that becomes separated from the remainder of the thallus (vegetative body), each of which has the capacity to grow and form new individuals. Results for hyphal fragments are in fragments/m3 and are not incorporated in the total spore concentration.
The droplet symbol (💧) refers to water-intrusion indicator spores. These fungal spores, when found on indoor air samples, can be an indication of moisture sources and resultant fungal growth that may be problematic.

Quantification: Analytical Sensitivity (A.S.): This is dependent on the volume of air collected, size of the trace, ocular diameter, and the amount of the trace that was analyzed.
The value of "Present" indicated in the Raw Count column represents the presence of this spore type during the preliminary exam at 400x. The Raw Count converts to a whole number if the spore type is encountered again during the 600x-1,000x enumeration. The sp/m3concentration will be reported as less than the analytical sensitivity if "Present" is reported in the Raw Count.
Results are reported to 3 significant figures. sp/m3: Spores per cubic meter.
Uncertainty: for raw count in the range of 0-50 the SR is 0.375, 51-100 SR=0.333, 101-200 SR=0.257, >200 SR=0.245
All results are to be considered preliminary and subject to change unless signed by the Technical Director or Deputy.
Analyst(s): Christopher Dell

Technical Director Tristan Ward

MOLD SPORE DESCRIPTIONS

Ascospores

Ascospores are spores formed inside an ascus (asci-plural) or sac-like cell which is contained inside a fruiting body called an ascocarp or an ascoma (ascomata-plural). An ascus typically contains a definite nuimber of ascospores, usually eight. Ascospores are unique in shape, size, and color as to the Genus/species they represent. These spores are specific to fungi classified as Ascomycetes. They are ubiquitous in nature. Many decay organic matter, others are plant or animal pathogens. They can grow indoors on damp materials. Release of ascospores are released by forcible ejection and dispersed by wind, water, animals and other agents. Health Effects: Depending on the Genera, Ascospores may be allergenic.

Basidiospores

Basidiospores are reproductive spores produced by a group of fungi called basidiomycetes. This group includes the mushrooms, shelf fungi and various other macrofungi. Basidipspores serve as the main air (wind) dispersal units for the fungi and their release is dependent upon moisture. The structure of the spore complex can develop in various manners resulting in different appearances. It is often found growing in soil, decaying plant debris, compost piles and fruit rot. Indoors, it can be found on water damaged building materials (chipboard /OSB, plywood, wallpaper, and glue) as well as on food items (dried foods, cheeses, fruits, herbs, spices, cereals). Health effects: Some basidiospores may produce toxins and can act as allergens. They have not been reported to be pathogens.

Cladosporium

Cladosporium is the most common indoor and outdoor mold. The spores are wind dispersed and are often extremely abundant in outdoor air. Many species are commonly found on living and dead plant material. Indoors, they may grow on surfaces with high moisture or high humidity levels such as damp window sills, poorly ventilated bathrooms and soiled refrigerators. It produces powdery or velvety olive-green to brown or black colonies. The conidia (spores) vary depending on the species and are formed in simple or branching chains with multi-attachment points. Health Effects: Cladosporium species are rarely pathogenic to humans, but have been reported to occassionally cause sinusitis and pulmonary infections as well as infections of the skin and toenails. The airborne spores are significant allergens, and in large amounts they may severely affect asthmatics and people with respiratory diseases.

Hyphal Fragments

Hyphal Fragments are segments or pieces of hyphae or mycelium that may have broken off during sampling (air, tape, dust). The mycelium is the entire mass of hyphae that makes up the vegetative body of a fungus. The presence of hyphal fragments may indicate the presence of viable mold.

Penicillium/Aspergillus Like

Penicillium and Aspergillus are ubiquitous, filamentous fungi that are found in soil, decaying plant debris, compost piles, and in the air. Indoors, spores are commonly found in house dust, in water-damaged buildings (wallpaper, wallpaper glue, decaying fabrics, moist chipboards, and behind paint) as well as fruit and grains. They are the most common fungal genera, worldwide. Both produce chains of spores that are small, round to oval, colorless or slightly pigmented, and smooth to rough walled. These spores are indistinguishable between the two as well as other genera, such as Gliocladium, Trichoderma, Paecilomyces, and Scopulariopsis. They differ as to their conidiophores or fruiting bodies. While, Aspergillus spores are produced from phialides supported on conidia heads or swollen vesicles, Penicillium spores are produced on finger-like projections. Depending on species, typical colonies of Aspergillus are initially white and later turn to either shades of green, yellow, orange, brown or black. Texture is usually velvety to cottony. Typical colonies of Penicillium, other than Penicillium marneffei (yeast-like at 37oC), grow rapidly, white in color at first, later becoming bluish green with white borders with velvety to powdery textures depending on species. Some species produce radial patterns. Health Effects: Both Aspergillus and Penicillium are potential allergens. Several species of Aspergillus (A. flavus and A. parasiticus) produce aflatoxins or natually occurring mycotoxins that are toxic and carcinogenic. These are found in contaminated foodstuff and are hazardous to consumers. Penicillium has only one known species that is pathogenic to humans (P. marneffei) that causes lethal systemic infection (Penicilliosis) in immunocompromised individuals.

Smuts/Periconia/Myxomycetes

Smuts, Periconia, and Myxomycetes spores are grouped together due to their similar round, brown morphology. Smuts are outdoor parasitic plant pathogens. They rarely grow indoors but may grow on host plants if appropriate conditions are present. They are parasitic plant pathogens. They can be found on cereal crops, grasses, flowing plants, weed, and other fungi. They can cause allergies. Periconia are found in soils, dead herbaceous stems and leaf spots, and grasses. They have wind dispersed dry spores. Their spores are abundant in the air but it is not known if they are allergenic. Myxomycetes are found on decaying logs, stumps and dead leaves. They have wind-dispersed dry spores and wet motile (amoebic phase) spores. During favorable conditions they move about like amoebae. They form dry airborne spores when conditions are unfavorable. They are rarely found indoors. Health Effects: They may cause Type 1 allergies (hay fever, asthma). No human infections have been reported.

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA-LAP (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 285302

Mailing/Billing Information:

1. Client Name: ATI, INC.
2. Address 1: 4221 Forbes Blvd
3. Address 2: Suite 250
4. Address 3: Lanham, MD 20706
5. Phone #: _____ Fax #: _____

Submittal Information:

1. Job Name: Buck Lodge Middle School
2. Job Location: 2611 Buck Lodge RD Adelphi, MD 20783
3. Job #: ~~20-608~~ 20-708 P.O. #: _____
4. Contact Person: Mikal Frater Cell: (848) 702-8621
5. Collected by: Mikal Frater Cell: _____

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Day and email/fax to contacts on file.

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
❑ 4 Hours ❑ Immediate Date Due: _____ ❑ 24 Hours Time Due: _____ Comments: _____	❑ 4 Hours ❑ 3 Day ❑ Same Day ■ 5 Day + Date Due: 12/16/20 ❑ Next Day ❑ Results Required By Noon ❑ 2 Day	■ Email: mikal@atiinc.com ■ Email 2: courtney@atiinc.com ❑ Verbals: _____

Asbestos Analysis

*PCM Air – Please Indicate Filter Type: _____
- ❑ NIOSH 7400 _____ (QTY)
- ❑ Fiberglass _____ (QTY)

TEM Air* – Please Indicate Filter Type: _____
- ❑ AHERA _____ (QTY)
- ❑ NIOSH 7402 _____ (QTY)
- ❑ Other (specify _____) _____ (QTY)

PLM Bulk
- ❑ EPA 600 – Visual Estimate _____ (QTY) ❑ Pos Stop
- ❑ EPA Point Count _____ (QTY)
- ❑ NY State Friable 198.1 _____ (QTY)
- ❑ Grav. Reduction ELAP 198.6 _____ (QTY)
- ❑ Other (specify _____) _____ (QTY)

MISC
- ❑ Vermiculite
- ❑ Asbestos Soil PLM__(Qual) PLM__(Quan) PLM/TEM__(Qual) PLM/TEM__(Quan)

*It is recommended that blank samples be submitted with all air and surface samples

TEM Bulk
- ❑ ELAP 198.4/Chatfield _____ (QTY)
- ❑ NY State PLM/TEM _____ (QTY)
- ❑ Residual Ash _____ (QTY)

TEM Dust*
- ❑ Qual. (pres/abs) Vacuum/Dust _____ (QTY)
- ❑ Quan. (s/area) Vacuum D5755-95 _____ (QTY)
- ❑ Quan. (s/area)Dust D6480-99 _____ (QTY)

TEM Water
- ❑ Qual. (pres/abs) _____ (QTY)
- ❑ ELAP 198.2/EPA 100.2 _____ (QTY)
- ❑ EPA 100.1 _____ (QTY)

A All samples received in good condition unless otherwise noted. (TEM Water samples _____ °C)

If field data sheets are submitted, there is no need to complete bottom section.

Metals Analysis
- ❑ Pb Paint Chip _____ (QTY)
- ❑ *Pb Dust Wipe (wipe type _____) _____ (QTY)
- ❑ *Pb Air _____ (QTY)
- ❑ Pb Soil/Solid _____ (QTY)
- ❑ Pb TCLP _____ (QTY)
- ❑ Drinking Water ❑ Pb _____ (QTY) ❑ Cu _____ (QTY) ❑ As _____ (QTY)
- ❑ Waste Water ❑ Pb _____ (QTY) ❑ Cu _____ (QTY) ❑ As _____ (QTY)
- ❑ Pb Furnace (Media _____) _____ (QTY)

Fungal Analysis

Collection Apparatus for Spore Traps/Air Samples: _____
Collection Media _____
- ■ *Spore-Trap 9 (QTY) ❑ Surface Vacuum Dust _____ (QTY)
- ❑ *Surface Swab _____ (QTY) ❑ Culturable ID Genus (Media _____) _____ (QTY)
- ❑ *Surface Tape _____ (QTY) ❑ Culturable ID Species (Media _____) _____ (QTY)
- ❑ Other (Specify _____) _____ (QTY)

CLIENT ID #	SAMPLE INFORMATION: SAMPLE LOCATION/ ID	DATE/ TIME (12/9/20)	VOL (L)/ Wipe Area	ANALYSIS: TEM	PCM	PLM	LEAD	MOLD	MATRIX: AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
20-708 1	Outdoors - Parking Lot	9:51 AM	75L										✓			Date/Time: Contact:By:
20-708 2	Field Blank	—	75L										✓			
20-708 3	Main Office	10:03 AM	75L										✓			
20-708 4	Cafeteria	10:13 AM	75L										✓			
20-708 5	Room 401	10:22 AM	75L										✓			Date/Time: Contact:By:
20-708 6	Room 710	10:32 AM	75L										✓			
20-708 7	Media Center	10:42 AM	75L										✓			
20-708 8	Room 701	10:51 AM	75L										✓			
20-708 9	Room 102	11:04 AM	75L										✓			Date/Time: Contact:By:

	Print Name	Signature	Date	Time
Relinquished by:	Mikal Frater	Mikal Frater	12.09.20	1:45pm
Received by:				
Relinquished by:				
Received for Lab by:			12/9/20	1400

Shipping Information
❑ UPS ❑ In-Person ❑ Other
❑ FedEx ❑ Drop Box
❑ USPS ❑ Courrier
Airbill/Tracking No: _____

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	285345	**Job Name:**	Buck Lodge Middle School	**Date Submitted:**	03/01/2021
Client:	ATI, Inc.	**Job Location:**	Class Room 102	**Person Submitting:**	Sama W.
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-708	**Date Analyzed:**	03/02/2021
		P.O. Number:	Not Provided	**Report Date:**	03/02/2021
Attention:	Courtney McCall				

AMA Sample #	285345-1	**AMA Sample #**	285345-2	**AMA Sample #**	285345-3
Client ID	3156-9735-A1	**Client ID**	3156-9982-A2	**Client ID**	3156-9751-A3
Analyst ID	CD	**Analyst ID**	CD	**Analyst ID**	CD
Collection Apparatus	Air-O-Cell	**Collection Apparatus**	Air-O-Cell	**Collection Apparatus**	Air-O-Cell
Sample Volume (L)	75	**Sample Volume (L)**	75	**Sample Volume (L)**	0
Sample Condition	Acceptable	**Sample Condition**	Acceptable	**Sample Condition**	Acceptable
Debris Loading	1	**Debris Loading**	1	**Debris Loading**	0
Location	Class Room 102	**Location**	Outside	**Location**	Field Blank

	Raw Ct	Trav/Flds	A.S.	sp/m^3	%
Alternaria					
Ascospores	18	15	53	954	32.7%
Basidiospores	34	15	53	1802	61.8%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium					
Curvularia					
Penicillium / Aspergillus	3	15	53	159	5.5%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	55	**Total sp/m^3:**	2915		

Comments

	Raw Ct	Trav/Flds	A.S.	sp/m^3	%
Alternaria					
Ascospores	122	4	198	24156	81.9%
Basidiospores	25	15	53	1325	16.8%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium					
Curvularia					
Penicillium / Aspergillus	2	15	53	106	1.3%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	149	**Total sp/m^3:**	25587		

Comments

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Alternaria					
Ascospores					
Basidiospores					
Bipolaris/Drechslera/Helm.					
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Curvularia					
Penicillium / Aspergillus					
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	0	**Total sp/m^3:**	0		

Comments
No Mold Spores Observed

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	285345	**Job Name:**	Buck Lodge Middle School	**Date Submitted:**	03/01/2021
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Results are reported to 3 significant figures. sp/m3: Spores per cubic meter.
Uncertainty: for raw count in the range of 0-50 the SR is 0.375, 51-100 SR=0.333, 101-200 SR=0.257, >200 SR=0.245
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Analyst(s): Christopher Dell

Technical Director Tristan Ward

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Basidiospores are reproductive spores produced by a group of fungi called basidiomycetes. This group includes the mushrooms, shelf fungi and various other macrofungi. Basidipspores serve as the main air (wind) dispersal units for the fungi and their release is dependent upon moisture. The structure of the spore complex can develop in various manners resulting in different appearances. It is often found growing in soil, decaying plant debris, compost piles and fruit rot. Indoors, it can be found on water damaged building materials (chipboard /OSB, plywood, wallpaper, and glue) as well as on food items (dried foods, cheeses, fruits, herbs, spices, cereals). Health effects: Some basidiospores may produce toxins and can act as allergens. They have not been reported to be pathogens.

Penicillium/Aspergillus Like

Penicillium and Aspergillus are ubiquitous, filamentous fungi that are found in soil, decaying plant debris, compost piles, and in the air. Indoors, spores are commonly found in house dust, in water-damaged buildings (wallpaper, wallpaper glue, decaying fabrics, moist chipboards, and behind paint) as well as fruit and grains. They are the most common fungal genera, worldwide. Both produce chains of spores that are small, round to oval, colorless or slightly pigmented, and smooth to rough walled. These spores are indistinguishable between the two as well as other genera, such as Gliocladium, Trichoderma, Paecilomyces, and Scopulariopsis. They differ as to their conidiophores or fruiting bodies. While, Aspergillus spores are produced from phialides supported on conidia heads or swollen vesicles, Penicillium spores are produced on finger-like projections. Depending on species, typical colonies of Aspergillus are initially white and later turn to either shades of green, yellow, orange, brown or black. Texture is usually velvety to cottony. Typical colonies of Penicillium, other than Penicillium marneffei (yeast-like at 37oC), grow rapidly, white in color at first, later becoming bluish green with white borders with velvety to powdery textures depending on species. Some species produce radial patterns. Health Effects: Both Aspergillus and Penicillium are potential allergens. Several species of Aspergillus (A. flavus and A. parasiticus) produce aflatoxins or natually occurring mycotoxins that are toxic and carcinogenic. These are found in contaminated foodstuff and are hazardous to consumers. Penicillium has only one known species that is pathogenic to humans (P. marneffei) that causes lethal systemic infection (Penicilliosis) in immunocompromised individuals.

Record Changes Report

Client: ATI, Inc.

Client Code: ATIINC

Chain of Custody: 285345

Date	Description
03/03/2021	Corrected Job Name per client request

AMA Analytical Services, Inc.
Focused on Results www.amalab.com
AIHA-LAP (#100470) NVLAP (#101143-0) NY ELAP (10920)
4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 285345

Mailing/Billing Information:
1. Client Name: ATI, Inc.
2. Address 1: 4221 Forbes Blvd.
3. Address 2: Lanham MD 20706
4. Address 3:
5. Phone #: 202-643-5423 Fax #:

Submittal Information:
1. Job Name: Bulk Lodge M.S.
2. Job Location: Class Room 102
3. Job #: 20-708 P.O. #:
4. Contact Person: Courtney McCall Cell: 703-399-5423
5. Collected by: Sama W. Cell: 240-413-3728

Reporting Info (Results provided as soon as technically feasible). If no TAT/Reporting Info is provided, AMA will assign defaults of 5-Day and email/fax to contacts on file.

AFTER HOURS (must be pre-scheduled)
- ☐ 4 Hours
- ☐ Immediate Date Due:
- ☐ 24 Hours Time Due:
- Comments:

NORMAL BUSINESS HOURS
- ☐ 4 Hours
- ☐ Same Day
- ☒ Next Day
- ☐ 2 Day
- ☐ 3 Day
- ☐ 5 Day +
- Date Due: 03/02/21
- ☐ Results Required By Noon

REPORT TO:
- ☒ Email: courtney@atiinc.com
- ☐ Email 2:
- ☐ Verbals:

Asbestos Analysis
*PCM Air – Please Indicate Filter Type:
- ☐ NIOSH 7400 (QTY)
- ☐ Fiberglass (QTY)

TEM Air* – Please Indicate Filter Type:
- ☐ AHERA (QTY)
- ☐ NIOSH 7402 (QTY)
- ☐ Other (specify) (QTY)

PLM Bulk
- ☐ EPA 600 – Visual Estimate (QTY) ☐ Pos Stop
- ☐ EPA Point Count (QTY)
- ☐ NY State Friable 198.1 (QTY)
- ☐ Grav. Reduction ELAP 198.6 (QTY)
- ☐ Other (specify) (QTY)

MISC
- ☐ Vermiculite
- ☐ Asbestos Soil PLM (Qual) PLM (Quan) PLM/TEM (Qual) PLM/TEM (Quan)

*It is recommended that blank samples be submitted with all air and surface samples

TEM Bulk
- ☐ ELAP 198.4/Chatfield (QTY)
- ☐ NY State PLM/TEM (QTY)
- ☐ Residual Ash (QTY)

TEM Dust*
- ☐ Qual. (pres/abs) Vacuum/Dust (QTY)
- ☐ Quan. (s/area) Vacuum D5755-95 (QTY)
- ☐ Quan. (s/area)Dust D6480-99 (QTY)

TEM Water
- ☐ Qual. (pres/abs) (QTY)
- ☐ ELAP 198.2/EPA 100.2 (QTY)
- ☐ EPA 100.1 (QTY)

☒ All samples received in good condition unless otherwise noted. (TEM Water samples °C)

If field data sheets are submitted, there is no need to complete bottom section.

Metals Analysis
- ☐ Pb Paint Chip (QTY)
- ☐ *Pb Dust Wipe (wipe type) (QTY)
- ☐ *Pb Air (QTY)
- ☐ Pb Soil/Solid (QTY)
- ☐ Pb TCLP (QTY)
- ☐ Drinking Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Waste Water ☐ Pb (QTY) ☐ Cu (QTY) ☐ As (QTY)
- ☐ Pb Furnace (Media) (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples: Cassette
Collection Media AIVO-Cell
- ☒ *Spore-Trap 3 (QTY)
- ☐ *Surface Swab (QTY)
- ☐ *Surface Tape (QTY)
- ☐ Other (Specify) (QTY)
- ☐ Surface Vacuum Dust (QTY)
- ☐ Culturable ID Genus (Media) (QTY)
- ☐ Culturable ID Species (Media) (QTY)

CLIENT ID #	SAMPLE INFORMATION / SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	ANALYSIS: TEM	PCM	PLM	LEAD	MATRIX: MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
								✓					✓			Date/Time: Contact:By:
3156-9735-A1	Class Room 102	03/01/21	75L					✓					✓			
3156-9982-A2	Outside	"	75L					✓					✓			
3156-9751-A3	Field Blank	"	—					—					—			Date/Time: Contact:By:
																Date/Time: Contact:By:

	Print Name	Signature	Date	Time
Relinquished by:	Don Sama W.		03/01/21	11:15
Received by:				
Relinquished by:				
Received for Lab by:			3/1/21	1711

Shipping Information
☐ UPS ☒ ~~Hand-Delivered~~ ☐ Other
☐ FedEx ☒ Drop Box
☐ USPS ☐ Courier
Airbill/Tracking No:

Appendix B: Instrument Calibration Records

Certificate of Calibration

(✓) Buck™ BioAire Pump Calibration Rotameter
( ) Buck™ BioSlide Pump Calibration Rotameter

Serial number: R15042
Date Calibrated: 11/12/2020 **Calibration Due Date:** 11/12/2021

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: Moroni Menk

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

BUCK

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	71.33 (21.9)	°F (°C)
RELATIVE HUMIDITY	53.9	%RH
BAROMETRIC PRESSURE	28.81 (975.6)	inHg (hPa)

MODEL	7575-X
SERIAL NUMBER	7575X1711004

☒ AS LEFT ☐ AS FOUND

☒ IN TOLERANCE ☐ OUT OF TOLERANCE

– CALIBRATION VERIFICATION RESULTS –

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

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	70.9 (21.6)	71.1 (21.7)	68.9~72.9 (20.5~22.7)				

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

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	28.82 (976.0)	28.82 (976.0)	28.24~29.40 (956.3~995.6)				

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	E004626	02-14-20	02-28-21	Pressure	E005254	10-10-19	10-31-20
Pressure	E003982	07-21-20	01-31-21	DC Voltage	E003493	06-17-20	06-30-21

CALIBRATED

August 31, 2020
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	71.24 (21.8)	°F (°C)
RELATIVE HUMIDITY	54.8	%RH
BAROMETRIC PRESSURE	28.74 (973.2)	inHg (hPa)

MODEL	7575-X
SERIAL NUMBER	7575X1711004

☐ 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	70.8 (21.6)	70.5 (21.4)	68.8~72.8 (20.4~22.7)				

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

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	28.75 (973.6)	28.84 (976.6)	28.17~29.33 (953.9~993.2)				

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	E004626	02-14-20	02-28-21	Pressure	E005254	10-10-19	10-31-20
Pressure	E003982	07-21-20	01-31-21	DC Voltage	E003493	06-17-20	06-30-21

VERIFIED

August 31, 2020
DATE

Doc. ID: CERT_GEN_WCC

TSI P/N 2300157

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ENVIRONMENT CONDITIONS		
TEMPERATURE	75.8 (24.3)	°F (°C)
RELATIVE HUMIDITY	48	%RH
BAROMETRIC PRESSURE	28.72 (972.6)	inHg (hPa)

MODEL	982
SERIAL NUMBER	P17100006

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

– CALIBRATION VERIFICATION RESULTS –

GAS CO_2 AS FOUND — SYSTEM G-101 — *Unit: ppm*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	0	0	0~50	4	3020.5	* 2874.5	2929.9~3111.1
2	504	460	454~554	5	5037	* 4771.8	4885.9~5188.1
3	1008	964	958~1058				

GAS CO AS FOUND — SYSTEM G-101 — *Unit: ppm*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	35.3	* 30.8	32.3~38.3	2	100.7	* 87.7	97.7~103.7

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

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	32.0 (0.0)	32.6 (0.3)	31.0~33.0 (−0.5~0.6)	2	139.8 (59.9)	140.6 (60.3)	138.8~140.8 (59.4~60.5)

HUMIDITY AS FOUND — SYSTEM H-102 — *Unit: %RH*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	10.0	10.5	7.0~13.0	4	70.0	69.6	67.0~73.0
2	30.0	30.4	27.0~33.0	5	90.0	88.9	87.0~93.0
3	50.0	50.4	47.0~53.0				

**Indicates Out-of-Tolerance Condition*

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
5000 CO_2	T-0660	07-15-20	07-15-28	200 CO	149848	03-24-20	03-24-28
N2	CT308798	06-28-20	06-28-28	Air	T608955	06-17-20	06-17-28
Flow	E003341	09-03-19	09-30-20	Flow	E003980	04-22-20	04-30-21
Flow	E003525	01-06-20	01-31-21	Flow	E003342	09-03-19	09-30-20
2000 C4H8	EB0054467	08-13-19	08-12-22	100 C4H8	CC507339	03-24-20	03-24-28
Temperature	E010657	02-14-20	02-28-21	Temperature	E010658	02-14-20	02-28-21
Temperture	E010655	01-21-20	01-31-21	Humidity	E003539	08-21-20	02-28-21

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VERIFIED

August 31, 2020
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	71.33 (21.9)	°F (°C)
RELATIVE HUMIDITY	53.9	%RH
BAROMETRIC PRESSURE	28.81 (975.6)	inHg (hPa)

MODEL	982
SERIAL NUMBER	P17100006

☒ AS LEFT ☐ AS FOUND

☒ IN TOLERANCE ☐ 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)	32.6 (0.3)	31.0~33.0 (−0.5~0.6)	2	139.8 (59.9)	140.6 (60.3)	138.8~140.8 (59.4~60.5)

HUMIDITY VERIFICATION — SYSTEM H-102 — *Unit: %RH*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	10.0	10.5	7.0~13.0	4	70.0	69.6	67.0~73.0
2	30.0	30.4	27.0~33.0	5	90.0	88.9	87.0~93.0
3	50.0	50.4	47.0~53.0				

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

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	0	0	0~50	4	3020	3025	2929~3110
2	504	501	454~554	5	5037	5026	4886~5188
3	1008	1027	958~1058				

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

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	35	36	32~38	2	101	100	98~104

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	E010657	02-14-20	02-28-21
Temperture	E010655	01-21-20	01-31-21
5000 CO_2	T-0660	07-15-20	07-15-28
N_2	CT308798	06-28-20	06-28-28
Flow	E003341	09-03-19	09-30-20
Flow	E003525	01-06-20	01-31-21
2000 C4H8	EB0054467	08-13-19	08-12-22

Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E010658	02-14-20	02-28-21
Humidity	E003539	08-21-20	02-28-21
200 CO	149848	03-24-20	03-24-28
Air	T608955	06-17-20	06-17-28
Flow	E003980	04-22-20	04-30-21
Flow	E003342	09-03-19	09-30-20
100 C4H8	CC507339	03-24-20	03-24-28

Bao Yang
CALIBRATED

August 31, 2020
DATE

Doc. ID. CERT_GEN_WCC

TSI P/N 2300157