ati INC
Architecture | Engineering | Construction

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March 4, 2021

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

RE: Indoor Air Quality Assessment, John Carroll Elementary School
Purchase Order: 734977
ATI Project Number: 20-698

Dear Mr. Baylor:

Prince George's County Public Schools requested that ATI, Inc., conduct a proactive indoor air quality (IAQ) assessment at John Carroll Elementary School on January 7, 2021 and follow-up assessments on February 24, 2021, and February 27, 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
John Carroll Elementary School
1400 Nalley Terrace
Landover, MD 20785

Prepared for:

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

March 4, 2021

Submitted by:

ATI Job # 20-698

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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 January 7, 2021, at John Carroll Elementary School, located at 1400 Nalley Terrace, in Landover, Maryland. On February 24, 2021 and February 27, 2021, ATI conducted follow-up assessments in select rooms which had *Aspergillus/Penicillium*-like mold spore concentrations great enough to warrant corrective actions and reassessment.

The initial assessment on January 7, 2021 included a visual evaluation 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 16 and the Health Suite all had unusual elevated fungal spore concentrations during the initial assessment and were selected for a follow-up assessment after actions were taken to reduce the presence of mold and repaired any water issues, if discovered during the initial assessment. The *Aspergillus/Penicillium*-like mold spore concentrations in Room 16 on February 24 had been reduced by 91% since the initial assessment; however, the mold spore concentrations in Room 16 were still considered elevated and required additional corrective actions. ATI performed a third assessment in Room 16 after the room was assessed and cleaned a second time. As part of all three 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. One of the tested spaces during the initial January 7, 2021 initial assessment had a temperature greater than the ASHRAE recommended winter range of 68°F - 75°F. The two tested spaces in the February 24, 2021 reassessment both had a temperature within the ASHRAE recommended range. Room 16 had a temperature less than the ASHRAE range on February 27, 2021, which occurred on a weekend, so the heat was likely turned down or off to save on energy costs.
2. The relative humidity in all tested spaces on January 7 and February 24 was less than the ASHRAE maximum relative humidity of 65%, but also less than 30%, which can cause occupant discomfort. On February 27, Room 16 had a relative humidity of 37%, which is less than the ASHRAE maximum recommended relative humidity, but greater than 30%
3. The carbon dioxide concentration in all tested spaces from all three assessment dates wase less than the ASHRAE limit for carbon dioxide, relative to the calculated ASHRAE maximum for each assessment date.
4. Carbon monoxide concentrations were less than the IAQ meter's detection limit throughout the tested spaces during all three assessments.
5. During the initial assessment on January 7, 2021, the Heath Suite and Room 16 were identified as having *Aspergillus/Penicillium*-like spore concentrations much greater than the typical indoor occupied space and were selected for corrective actions to reduce the presence of mold spores and be reassessed.
6. During the first follow-up assessment on February 24, 2021, the *Aspergillus/Penicillium*-like spore concentration in the Health Suite was undetectable, resulting in an *Aspergillus/Penicillium*-like spore concentration reduction of 100%. However, the *Aspergillus/Penicillium*-like spore concentration in Room 16 on February 24, 2021 was reduced by 91% but was still greater than the typical occupied space. ATI recommended additional corrective actions in Room 16 to further reduce airborne mold concentrations.
7. ATI reassessed Room 16 on February 27, 2021 and the *Aspergillus/Penicillium*-like spore concentration was undetected on the sample, resulting in an *Aspergillus/Penicillium*-like spore concentration reduction of 100%.

2 Assessment Methods

Mikal Frater, IH of ATI, Inc. conducted the initial visual assessment and air sampling on January 7, 2021. 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. Mr. Chapman conducted a follow-up inspection on February 24,

2021 in the Health Unit and Room 16 after the areas were treated for mold presence. Ms. Frater then reassessed the area in Room 16 on February 27, 2021 after the area was retreated for mold presence, specifically for *Aspergillus/Penicillium*. 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	January 7, 2021 Observations
Outdoors – Parking Lot	• Light winds • No vehicle or foot traffic
Main Office	• Building is not occupied by students; county office building • Light dust accumulation on surfaces • One occupant at time of assessment • No stained ceiling tile, visible growth, or odor observed • One air supply, one air return • Space is approximately 368 ft.^{2}
Health Suite	• Two occupants at time of assessment • Door to corridor open • Currently used as a conference room • Light dust accumulation on surfaces • One air supply, one air return • No stained ceiling tiles, odor, or observed mold growth • Space is approximately 290 ft.^{2}
Cafetorium	• One occupant at time of assessment • Space has been repurposed as a storage and seating area • No stained ceiling tile, visible growth, or odor observed • Light dust accumulation on surfaces • Six air supplys, five air returns • Space is approximately 2,086 ft.^{2}

Sample Location	January 7, 2021 Observations
Library	• Two occupants at time of assessment • Moderate dust accumulation on surfaces • Open floor plan – no doorway • Space repurposed as furniture storage • No stained ceiling tile, visible growth, or odor observed • Space is approximately 2,330 ft.^{2}
Room 4	• One occupant at time of assessment • Emergency exit – outdoor access • Light brown stained ceiling tiles with black spots observed above sink area • One air supply, two air returns • Air return is very close to emergency exit door • Space is approximately 1,013 ft.^{2}
Room 16	• One occupant at time of assessment • Space repurposed as office cubicles • Light dust accumulation on surfaces • Emergency exit – outdoor access • One air supply, two air returns • Air return is very close to emergency exit • Light brown stained ceiling tile in line with sprinkler system, directly above light fixture • Space is approximately 952 ft.^{2}
Sample Location	**February 24, 2021 Reassessment Observations**
Outside	• Clear skies, south winds at 10MPH • Dew point at 29° falling from 30.10°
Health Suite	• Currently used as a conference room with seventeen bookshelves filled with three-ring binders. Books/paper will hold moisture over time and collect debris on surfaces. • Light dust accumulation on surfaces • One air supply, one air return • No stained ceiling tiles, odor, or observed mold growth • Space is approximately 290 ft.^{2}
Room 16	• Light dust accumulation on surfaces • Emergency exit in the rear of the space – outdoor access • One air supply, two air returns • Area is equipped with eight cubicle workstations • Handwashing sink in rear of office • Water damage to plywood below the row of windows in the rear of the suite. water marks visible on the decorative plywood when looking at an angle and bottom right corner is damaged

Sample Location	February 27, 2021 Reassessment Observations
Outdoors	• Light rain, cloudy skies • No foot/vehicle traffic
Room 16	• Two occupants at time of assessment • Door to emergency exit closed

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 January 7, 2021 initial assessment and reassessment from February 24, 2021 are summarized in Table 2. As indicated by the data in the table, temperatures in the school on January 7 averaged between 69°F and 76°F, with one tested location measuring greater than the ASHRAE recommended winter range.

ATI reassessed select rooms that had unusual fungal spore concentrations on February 24, 2021, after remediation actions were completed. ATI also reassessed the temperature in the reassessed rooms. The average temperatures in the two reassessed locations were both within the ASHRAE recommended winter range.

ATI reassessed Room 16 on February 27, 2021 and the measured temperature was 65°F, which is less than the ASHRAE recommended range; however, the space was assessed on the weekend when the heat was likely turned down to save on energy costs.

Table 2: Temperature

Sample Location	1/7/2021 Initial Assessment Temperature in °F			ASHRAE Standard °F
	Min	Max	Average	
Outdoors	42	42	42	N/A
Indoors				
Main Office	76	76	76	68°F - 75°F
Health Suite	68	69	69	68°F - 75°F
Cafetorium	74	74	74	68°F - 75°F
Library	73	75	74	68°F - 75°F
Room 4	72	73	73	68°F - 75°F
Room 16	70	70	70	68°F - 75°F
02/24/21 Reassessment Temperature in °F				
Outdoors	57	57	57	N/A
Indoors				
Health Suite	71	73	72	68°F - 75°F
Room 16	73	73	73	68°F - 75°F
2/27/21 Reassessment Temperature in °F				
Outdoors	44	48	46	N/A

02/24/21 Reassessment Temperature in °F				
Indoors				
Room 16	64	65	65	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 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 less than 30% may result in drying of occupants' mucous membranes and skin. Relative humidity measurements for January 7, 2021, February 24, 2021, and February 27, 2021 are summarized in Table 3. As indicated by the data in the table, the average relative humidity on January 7 ranged between 16% and 23% with all tested locations measuring less than the ASHRAE maximum recommendation of 65% relative humidity, but also less than 30% relative humidity.

ATI reassessed select rooms that had unusual fungal spore concentrations on February 24, 2021, after remediation actions were completed. ATI also reassessed the relative humidity in the space, and the average relative humidity ranged between 21% and 22%, less than the ASHRAE maximum recommendation of 65% relative humidity but also less than 30% relative humidity. The relative humidity in Room 16 on February 27, was 37%, which is less than the ASHRAE recommended maximum of 65%.

Table 3: Relative Humidity

Sample Location	1/7/2021 (% RH)			ASHRAE Standard (% RH)
	Min	Max	Average	
Outdoors	46	50	48	N/A
Indoors				
Main Office	15	16	16	< 65
Health Suite	23	23	23	< 65
Cafetorium	17	18	18	< 65
Library	16	18	17	< 65
Room 4	17	18	18	< 65
Room 16	20	20	20	< 65
2/24/2021 Reassessment Relative Humidity				
Outdoors	27	27	27	N/A
Indoors				
Health Suite	21	23	22	< 65
Room 16	21	21	21	< 65
2/27/2021 Reassessment Relative Humidity (%RH)				
Outdoors	54	70	62	N/A
Indoors				
Room 16	36	38	37	< 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 January 7, 2021, February 24, 2021 and February 27, 2021 are summarized in Table 4. On the day of the assessment, the average outdoor carbon dioxide concentration was 339 ppm, which calculates to a maximum indoor concentration of 1,039 ppm (700 + 339). All tested locations indoors were less than the recommended maximum for the day of the assessment.

ATI reassessed select rooms that had unusual fungal spore concentrations on February 24, 2021 and again in Room 16 on February 27, 2021, after remediation actions were completed. The average outdoor carbon dioxide concentration on February 24, 2021 was 396 ppm, which calculates to a maximum indoor concentration of 1,096 ppm (700 + 396). The average outdoor carbon dioxide concentration on February 27, 2021 was 387 ppm, which calculates to a maximum indoor concentration of 1,087 ppm (700 + 387).All tested locations indoors on both reassessment dates were less than the recommended maximum for the day of the reassessment.

Table 4: Carbon Dioxide

Sample Location	1/7/2021 Concentration (parts per million)			ASHRAE Standard (ppm)
	Min	Max	Average	
Outdoors	330	347	339	N/A
Indoors				
Main Office	400	412	406	< 1,039
Health Suite	405	405	405	< 1,039
Cafetorium	394	397	396	< 1,039
Library	437	449	443	< 1,039
Room 4	402	403	403	< 1,039
Room 16	400	406	403	< 1,039
2/24/2021 Reassessment Concentrations (PPM)				
Outdoors	393	399	396	N/A
Indoors				
Health Suite	472	478	475	<1,096
Room 16	449	461	455	<1,096
2/27/2021 Reassessment Concentration (parts per million)				
Outdoors	372	401	387	N/A
Indoors				
Room 16	400	424	412	< 1,087

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 January 7, 2021 were less than the Q-Trak's detection limit throughout the school.

ATI reassessed select rooms that had unusual fungal spore concentrations on February 24, 2021 and again in Room 16 on February 27, 2021, after remediation actions were completed. The carbon monoxide concentrations measured during both reassessments are included in Table 5. The carbon monoxide concentrations from both reassessments were also 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	1/7/2021 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
Health Suite	< 3	< 3	< 3	< 9
Cafetorium	< 3	< 3	< 3	< 9
Library	< 3	< 3	< 3	< 9
Room 4	< 3	< 3	< 3	< 9
Room 16	< 3	< 3	< 3	< 9
2/24/2021 Reassessment Concentration (parts per million)				
Outdoors	< 3	< 3	< 3	N/A
Indoors				
Health Suite	< 3	< 3	< 3	< 9
Room 16	< 3	< 3	< 3	< 9
2/27/2021 Reassessment Concentration (parts per million)				
Outdoors	< 3	< 3	< 3	N/A
Indoors				
Room16	< 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 January 7, 2021, February 24, 2021, and February 27, 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 January 7, 2021 suggested unusual mold spore concentrations in two locations: The Health Suite and Room 16. The total ambient, outdoor spore concentration was 1,060 spores/m^3. Room 16 had the greatest total spore concentration of 42,053 spores/m^3, with *Aspergillus/Penicillium*-like spores being the predominant spores present at 42,000 spores/m^3. The Health Suite had a total spore concentration of 12,210 spores/m^3, with *Aspergillus/Penicillium*-like spores being the predominant spores present at 12,102 spores/m^3.

The fungal spore concentrations in Room 16 and the Health Suite were greater than the typical occupied space and suggest at least some level of mold amplification indoors. ATI recommended evaluating these rooms and the surrounding areas to try and identify water sources, abate any mold issues and clean the area before retesting the space. All other assessed spaces had mold spore concentrations typical of most indoor occupied spaces and do not suggest indoor mold growth.

The Health Suite and Room 16 was reassessed on February 24, 2021 after the initial assessment indicated the unusual presence of airborne mold spores. The *Aspergillus/Penicillium*-like spore concentration in the Health Suite was undetectable, with an *Aspergillus/Penicillium*-like concentration reduction of 100%. However, The *Aspergillus/Penicillium*-like spore concentration in Room 16, while being reduced by 91% when compared to the concentration on January 7, still had an *Aspergillus/Penicillium*-like spore concentration of 3,975 spores/m^3, which is still considered greater than the typical indoor space. ATI reassessed Room 16 on February 27, 2021, and the *Aspergillus/Penicillium*-like spore concentration was undetectable, with an *Aspergillus/Penicillium*-like concentration reduction of 100%. The follow-up sampling results suggest the actions taken to reduce airborne mold spores throughout the spaces was successful. Differences in concentrations between both dates of assessment are summarized in Table 6.

Table 6: *Aspergillus/Penicillium* Concentration Comparison

Sample Location	January 7, 2021 Concentrations	February 24, 2021 Concentrations	February 27, 2021 Concentrations	% Change from January 7 to February 27
Health Suite	12,104	None Detected	Not Assessed	-100%
Room 16	42,000	3,975	None Detected	-100%

The official laboratory reports with spore trap samples collected on January 7, 2021, February 24, 2021 and February 27, 2021 are in Appendix A.

6 Summary of Findings

1. One of the tested spaces during the initial January 7, 2021 initial assessment had a temperature greater than the ASHRAE recommended winter range of 68°F - 75°F. The two tested spaces in the February 24, 2021 reassessment both had a temperature within the ASHRAE recommended range. Room 16 had a temperature less than the ASHRAE range on February 27, 2021, which occurred on a weekend, so the heat was likely turned down or off to save on energy costs.
2. The relative humidity in all tested spaces on January 7 and February 24 was less than the ASHRAE maximum relative humidity of 65%, but also less than 30%, which can cause occupant discomfort. On February 27, Room 16 had a relative humidity of 37%, which is less than the ASHRAE maximum recommended relative humidity, but greater than 30%
3. The carbon dioxide concentration in all tested spaces from all three assessment dates wase less than the ASHRAE limit for carbon dioxide, relative to the calculated ASHRAE maximum for each assessment date.

4. Carbon monoxide concentrations were less than the IAQ meter's detection limit throughout the tested spaces during all three assessments.
5. During the initial assessment on January 7, 2021, the Heath Suite and Room 16 were identified as having *Aspergillus/Penicillium*-like spore concentrations much greater than the typical indoor occupied space and were selected for corrective actions to reduce the presence of mold spores and be reassessed.
6. During the first follow-up assessment on February 24, 2021, the *Aspergillus/Penicillium*-like spore concentration in the Health Suite was undetectable, resulting in an *Aspergillus/Penicillium*-like spore concentration reduction of 100%. However, the *Aspergillus/Penicillium*-like spore concentration in Room 16 on February 24, 2021 was reduced by 91% but was still greater than the typical occupied space. ATI recommended additional corrective actions in Room 16 to further reduce airborne mold concentrations.
7. ATI reassessed Room 16 on February 27, 2021 and the *Aspergillus/Penicillium*-like spore concentration was undetected on the sample, resulting in an *Aspergillus/Penicillium*-like spore concentration reduction of 100%.

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: 285319
Client: ATI, Inc.
Address: 9220 Rumsey Road
Suite 100
Columbia, MD 21045
Attention: Mikal Frater

Job Name: PGCPS IAQ - John Carroll Elementary School
Job Location: 1400 Nalley Terrace, Landover, MD
Job Number: 20-698
P.O. Number: Not Provided

Date Submitted: 01/07/2021
Person Submitting: Mikal Frater
Date Analyzed: 01/14/2021
Report Date: 01/14/2021

AMA Sample #	285319-1
Client ID	20-698-1
Analyst ID	TLW
Collection Apparatus	Air-O-Cell
Sample Volume (L)	75
Sample Condition	Acceptable
Debris Loading	2
Location	Parking Lot

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	1	15	53	53	5%
Basidiospores	15	15	53	795	75%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	1	15	53	53	5%
Curvularia					
Penicillium / Aspergillus	1	15	53	53	5%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown	1	15	53	53	5%
Other Colorless	1	15	53	53	5%
Nigrospora					
Epicoccum					
Hyphal Fragments*					

Total Raw Ct: 20 **Total sp/m³:** 1060

Comments

AMA Sample #	285319-2
Client ID	20-698-2
Analyst ID	TLW
Collection Apparatus	Air-O-Cell
Sample Volume (L)	0
Sample Condition	Acceptable
Debris Loading	1
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					
Other Colorless					
Nigrospora					
Epicoccum					
Hyphal Fragments*					

Total Raw Ct: 0 **Total sp/m³:** 0

Comments
No mold spores observed.

AMA Sample #	285319-3
Client ID	20-698-3
Analyst ID	TLW
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					
Basidiospores	3	15	53	159	8.1%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	23	15	53	1219	62.2%
Curvularia					
Penicillium / Aspergillus	11	15	53	583	29.7%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Other Colorless					
Nigrospora	Present	15	53	<53	
Epicoccum					
Hyphal Fragments*					

Total Raw Ct: 37 **Total sp/m³:** 1961

Comments

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	285319	**Job Name:**	PGCPS IAQ - John Carroll Elementary School	**Date Submitted:**	01/07/2021
Client:	ATI, Inc.	**Job Location:**	1400 Nalley Terrace, Landover, MD	**Person Submitting:**	Mikal Frater
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-698	**Date Analyzed:**	01/14/2021
		P.O. Number:	Not Provided	**Report Date:**	01/14/2021
Attention:	Mikal Frater				

AMA Sample #	285319-4	285319-5	285319-6
Client ID	20-698-4	20-698-5	20-698-6
Analyst ID	TLW	TLW	TLW
Collection Apparatus	Air-O-Cell	Air-O-Cell	Air-O-Cell
Sample Volume (L)	75	75	75
Sample Condition	Acceptable	Acceptable	Acceptable
Debris Loading	1	1	1
Location	Health Suite	Cafetorium	Library

	Raw Ct	Trav/Flds	A.S.	sp/m³	%	Raw Ct	Trav/Flds	A.S.	sp/m³	%	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria															
Ascospores											2	15	53	106	12.5%
Basidiospores	2	15	53	106	1.4%	2	15	53	106	16.7%	2	15	53	106	12.5%
Bipolaris/Drechslera/Helm.															
Chaetomium															
Cladosporium															
Curvularia															
Penicillium / Aspergillus	136	9	89	12104	98.6%	10	15	53	530	83.3%	3	15	53	159	18.8%
Smuts/Periconia/Myxomycetes											9	15	53	477	56.3%
Stachybotrys/Memnoniella															
Ulocladium															
Unknown															
Other Colorless															
Nigrospora															
Epicoccum	Present	15	53	<53											
Hyphal Fragments*						2	15	53	106	16.7%					
Total Raw Ct:	138		**Total sp/m³:**	12210		12		**Total sp/m³:**	636		16		**Total sp/m³:**	848	
Comments						**Comments**					**Comments**				

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	285319	**Job Name:**	PGCPS IAQ - John Carroll Elementary School	**Date Submitted:**	01/07/2021
Client:	ATI, Inc.	**Job Location:**	1400 Nalley Terrace, Landover, MD	**Person Submitting:**	Mikal Frater
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-698	**Date Analyzed:**	01/14/2021
		P.O. Number:	Not Provided	**Report Date:**	01/14/2021
Attention:	Mikal Frater				

AMA Sample #	285319-7	**AMA Sample #**	285319-8
Client ID	20-698-7	**Client ID**	20-698-8
Analyst ID	TLW	**Analyst ID**	TLW
Collection Apparatus	Air-O-Cell	**Collection Apparatus**	Air-O-Cell
Sample Volume (L)	75	**Sample Volume (L)**	75
Sample Condition	Acceptable	**Sample Condition**	Acceptable
Debris Loading	1	**Debris Loading**	2
Location	RM 4	**Location**	RM 16

	Raw Ct	Trav/Flds	A.S.	sp/m^3	%
Alternaria					
Ascospores					
Basidiospores	2	15	53	106	16.7%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	2	15	53	106	16.7%
Curvularia					
Penicillium / Aspergillus	8	15	53	424	66.7%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Other Colorless					
Nigrospora					
Epicoccum					
Hyphal Fragments*					
Total Raw Ct:	12		**Total sp/m^3:**	636	

Comments

	Raw Ct	Trav/Flds	A.S.	sp/m^3	%
Alternaria					
Ascospores					
Basidiospores					
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	1	15	53	53	0.9%
Curvularia					
Penicillium / Aspergillus	105	2	400	42000	99.1%
Smuts/Periconia/Myxomycetes	Present	15	53	<53	
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Other Colorless					
Nigrospora					
Epicoccum					
Hyphal Fragments*	4	15	53	212	3.8%
Total Raw Ct:	106		**Total sp/m^3:**	42053	

Comments

Aspergillus conidiophore observed.

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	285319	**Job Name:**	PGCPS IAQ - John Carroll Elementary School	**Date Submitted:**	01/07/2021
Client:	ATI, Inc.	**Job Location:**	1400 Nalley Terrace, Landover, MD	**Person Submitting:**	Mikal Frater
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-698	**Date Analyzed:**	01/14/2021
		P.O. Number:	Not Provided	**Report Date:**	01/14/2021
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

Interpretation of the data contained in this report is the sole responsibility of the client or the persons who conducted the field work. There are no federal or national standards for the number of fungal spores that may be present in the indoor environment. As a general rule and guideline that is widely accepted in the indoor air quality field, the numbers and types of spores that are present in the indoor environment should be comparable to those that are present outdoors at any given time. There will always be some mold spores present in "Normal" indoor environments. The purpose of sampling and counting spores is to help determine whether an abnormal condition exists within the indoor environment and if it does, to help pinpoint the area of contamination. Spore counts should not be used as the sole determining factor of mold contamination. There are many factors that can cause anomalies in the comparison of indoor and outdoor samples due to the dynamic nature of both of those environments.

This report is provided for informational and comparative purposes only and should not be relied upon for any other purpose. Sampling techniques, possible contaminants, unrepresentative samples and other similar or dissimilar factors may affect these results. With the statistical evaluation provided, as with all statistical comparisons and analyses, false-positive and false-negative results can and do occur. AMA Analytical Services, Inc. hereby disclaims any liability for any and all direct, indirect, punitive, incidental, special or consequential damages arising out of the use or interpretation of the data contained in, or any actions taken or omitted in reliance upon, this report.

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	285319	**Job Name:**	PGCPS IAQ - John Carroll Elementary School	**Date Submitted:**	01/07/2021
Client:	ATI, Inc.	**Job Location:**	1400 Nalley Terrace, Landover, MD	**Person Submitting:**	Mikal Frater
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-698	**Date Analyzed:**	01/14/2021
		P.O. Number:	Not Provided	**Report Date:**	01/14/2021
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): Tristan Ward

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.

Epicoccum

Epicoccum is a cosmopolitan fungus that is often found growing outside in soil, plant litter, decaying plants, and damaged plant tissue. Indoors, it can be found growing on a variety of building materials including paper and textiles. Colonies have a rapid growth rate with cottony texture, initially yellow or orange becoming brown to black in color. Conidiophores or fruiting bodies produce dense masses where conidia (spores) arise. Spores are round to pear-shaped, smooth to warty, brown to black in color and muriform (partitioned in both directions, like a soccer ball). Health Effects: This mold can act as a potential allergen. Some people may experience hay fever and or asthma. This mold has not been linked to any human or animal infection.

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.

Nigrospora

Nigrospora is a ubiquitous, filamentous, dark colored fungus commonly isolated from soil, decaying plants, and seeds. Indoors, it is considered a laboratory contaminant. Colonies grow rapidly, initially white and woolly, later turning gray with black areas, and eventually turning black (both front and reverse). Its conidia are black, solitary, unicellular, slightly flattened horizontally, and have a thin equatorial germ slit. Health Effects: This mold may be a potential allergen. It is uncertain whether it is pathogenic to humans.

Other Colorless

- “Other Colorless” are all non-distinctive, unidentifiable, colorless spores seen on spore trap samples and include all the genera that do not have distinguishing morphology to belong to any of the other defined categories."

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.

Unknown Fungi

“Unknown Fungi” are spores that cannot be identified under direct microscopic analysis. This includes partial spores. This category also includes spores that are hidden or hard to see during microscopic examination due to heavy presence of particulate.

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) 285319

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: PGCPS IAQ - JOHN CARROLL ES
2. Job Location: 1400 NALLEY TERRACE LANDOVER, MD
3. Job #: 20-698 P.O. #: _____
4. Contact Person: MIKAL FRATER Cell: (848) 702-8621
5. Collected by: " 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: 1/14/21 ☐ Next Day ☐ Results Required By Noon ☐ 2 Day	■ Email: MIKAL@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: _____
Collection Media _____
- ■ *Spore-Trap 8 (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	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)
20-698 ①	PARKING LOT	1/7/21	75L					✓					✓			Date/Time: Contact:By:
20-698 ②	FIELD BLANK	—	—					✓					✓			
20-698 ③	MAIN OFFICE	1/7/21	75L					✓					✓			
20-698 ④	HEALTH SUITE	1/7/21	75L					✓					✓			
20-698 ⑤	CAFETORIUM	1/7/21	75L					✓					✓			Date/Time: Contact:By:
20-698 ⑥	LIBRARY	1/7/21	75L					✓					✓			
20-698 ⑦	ROOM 4	1/7/21	75L					✓					✓			
20-698 ⑧	ROOM 16	1/7/21	75L					✓					✓			
																Date/Time: Contact:By:

	Print Name	Signature	Date	Time
Relinquished by:	MIKAL FRATER	Mikal Frater	1/7/2021	1:30 PM
Received by:				
Relinquished by:				
Received for Lab by:			1/7/21	1330

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

AMA Analytical Services, Inc.
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CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	285305	**Job Name:**	John Carroll Elementary School	**Date Submitted:**	02/24/2021
Client:	ATI, Inc.	**Job Location:**	1400 Nalley Terrace, Landover, MD 20785	**Person Submitting:**	Brian Chapman
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-697	**Date Analyzed:**	02/24/2021
		P.O. Number:	Not Provided	**Report Date:**	02/25/2021
Attention:	Brian Chapman				

AMA Sample #	285305-1	**AMA Sample #**	285305-2	**AMA Sample #**	285305-3
Client ID	20-697-01B	**Client ID**	20-697-02B	**Client ID**	20-697-03B
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)**	0	**Sample Volume (L)**	75
Sample Condition	Acceptable	**Sample Condition**	Acceptable	**Sample Condition**	Acceptable
Debris Loading	1	**Debris Loading**	0	**Debris Loading**	1
Location	Outside	**Location**	Blank	**Location**	Health Ste.

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	13	15	53	689	56.5%
Basidiospores	6	15	53	318	26.1%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	Present	15	53	<53	
Curvularia					
Penicillium / Aspergillus	4	15	53	212	17.4%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Other Colorless					
Hyphal Fragments*					
Total Raw Ct:	23	**Total sp/m³:**	1219		

Comments

	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					
Other Colorless					
Hyphal Fragments*					
Total Raw Ct:	0	**Total sp/m³:**	0		

Comments
No Mold Spores Observed

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	3	15	53	159	27.3%
Basidiospores	5	15	53	265	45.5%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	2	15	53	106	18.2%
Curvularia					
Penicillium / Aspergillus					
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Other Colorless	1	15	53	53	9.1%
Hyphal Fragments*	1	15	53	53	9.1%
Total Raw Ct:	11	**Total sp/m³:**	583		

Comments

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody: 285305
Client: ATI, Inc.
Address: 9220 Rumsey Road
Suite 100
Columbia, MD 21045
Attention: Brian Chapman

Job Name: John Carroll Elementary School
Job Location: 1400 Nalley Terrace, Landover, MD 20785
Job Number: 20-697
P.O. Number: Not Provided

Date Submitted: 02/24/2021
Person Submitting: Brian Chapman
Date Analyzed: 02/24/2021
Report Date: 02/25/2021

AMA Sample # 285305-4
Client ID 20-697-04B
Analyst ID CD
Collection Apparatus Allergenco
Sample Volume (L) 75
Sample Condition Acceptable
Debris Loading 1
Location Room 16

	Raw Ct	Trav/Flds	A.S.	sp/m^3	%
Alternaria					
Ascospores	2	15	53	106	2.1%
Basidiospores	3	15	53	159	3.1%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	14	15	53	742	14.6%
Curvularia					
Penicillium / Aspergillus	75	15	53	3975	78.1%
Smuts/Periconia/Myxomycetes	2	15	53	106	2.1%
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Other Colorless					
Hyphal Fragments*	3	15	53	159	3.1%
Total Raw Ct:	96		**Total sp/m^3:**		5088

Comments

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	285305	**Job Name:**	John Carroll Elementary School	**Date Submitted:**	02/24/2021
Client:	ATI, Inc.	**Job Location:**	1400 Nalley Terrace, Landover, MD 20785	**Person Submitting:**	Brian Chapman
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-697	**Date Analyzed:**	02/24/2021
		P.O. Number:	Not Provided	**Report Date:**	02/25/2021
Attention:	Brian Chapman				

Spore Comparison Guide

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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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This report is provided for informational and comparative purposes only and should not be relied upon for any other purpose. Sampling techniques, possible contaminants, unrepresentative samples and other similar or dissimilar factors may affect these results. With the statistical evaluation provided, as with all statistical comparisons and analyses, false-positive and false-negative results can and do occur. AMA Analytical Services, Inc. hereby disclaims any liability for any and all direct, indirect, punitive, incidental, special or consequential damages arising out of the use or interpretation of the data contained in, or any actions taken or omitted in reliance upon, this report.

AMA Analytical Services, Inc.
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CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	285305	**Job Name:**	John Carroll Elementary School	**Date Submitted:**	02/24/2021
Client:	ATI, Inc.	**Job Location:**	1400 Nalley Terrace, Landover, MD 20785	**Person Submitting:**	Brian Chapman
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-697	**Date Analyzed:**	02/24/2021
		P.O. Number:	Not Provided	**Report Date:**	02/25/2021
Attention:	Brian Chapman				

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.

Other Colorless

- “Other Colorless” are all non-distinctive, unidentifiable, colorless spores seen on spore trap samples and include all the genera that do not have distinguishing morphology to belong to any of the other defined categories."

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
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(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 285305

Mailing/Billing Information:
1. Client Name: ATI, Inc
2. Address 1: 4221 Forbes Blvd.
3. Address 2: Ste 250
4. Address 3: Lanham, MD 20706
5. Phone #: _____ Fax #: _____

Submittal Information:
1. Job Name: John Carroll E.S.
2. Job Location: 1400 Nalley Terrace, Landover, MD 20785
3. Job #: 20-697 P.O. #: _____
4. Contact Person: Brian Chapman Cell: 202-368-1376
5. Collected by: " " 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 + ☒ Next Day Date Due: 2/25/21 ☐ 2 Day ☑ Results Required By Noon	☒ Email: Brian@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)
☐ 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 4 (QTY) ☐ Surface Vacuum Dust _____ (QTY)
☐ *Surface Swab _____ (QTY) ☐ Culturable ID Genus (Media _____) _____ (QTY)
☐ *Surface Tape _____ (QTY) ☐ Culturable ID Species (Media _____) _____ (QTY)
☐ Other (Specify _____) _____ (QTY

SAMPLE INFORMATION CLIENT ID #	SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	ANALYSIS TEM	PCM	PLM	LEAD	MOLD	AIR	MATRIX BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
20-697-01B	outside	2-24-21	75L				Y	Y			10:38		AIR			Date/Time: Contact:By:
02B	Blank	2-24-21	~~TEM~~ N/A				Y	Y			—					
03B	Health Ste	2-24-21	75L				Y	Y			10:50					
04B	Room 116		75L				Y	Y			11:05					
																Date/Time: Contact:By:
																Date/Time: Contact:By:

	Print Name	Signature	Date	Time
Relinquished by:	Brian Chapman		2-24-21	11:37
Received by:				
Relinquished by:				
Received for Lab by:			2/24/21	1136

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:	285348	**Job Name:**	IAQ - PGCPS	**Date Submitted:**	03/01/2021
Client:	ATI, Inc.	**Job Location:**	John Carroll Elementary School	**Person Submitting:**	Mikal Frater
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-698	**Date Analyzed:**	03/02/2021
		P.O. Number:	Not Provided	**Report Date:**	03/03/2021
Attention:	Mikal Frater				

AMA Sample #	285348-1	**AMA Sample #**	285348-2	**AMA Sample #**	285348-3
Client ID	20-698-1	**Client ID**	20-698-2	**Client ID**	20-698-3
Analyst ID	TLW	**Analyst ID**	TLW	**Analyst ID**	TLW
Collection Apparatus	Air-O-Cell	**Collection Apparatus**	Air-O-Cell	**Collection Apparatus**	Air-O-Cell
Sample Volume (L)	75	**Sample Volume (L)**	0	**Sample Volume (L)**	75
Sample Condition	Acceptable	**Sample Condition**	Acceptable	**Sample Condition**	Acceptable
Debris Loading	1	**Debris Loading**	1	**Debris Loading**	1
Location	Parking Lot	**Location**	Field Blank	**Location**	RM 16

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	31	15	53	1643	59.6%
Basidiospores	18	15	53	954	34.6%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	1	15	53	53	1.9%
Curvularia					
Penicillium / Aspergillus	2	15	53	106	3.8%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	52	**Total sp/m³:**	2756		

Comments

	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.

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	1	15	53	53	33.3%
Basidiospores	1	15	53	53	33.3%
Bipolaris/Drechslera/Helm.					
Chaetomium	1	15	53	53	33.3%
Cladosporium					
Curvularia					
Penicillium / Aspergillus					
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	3	**Total sp/m³:**	159		

Comments
Minimal trace impaction.

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	285348	**Job Name:**	IAQ - PGCPS	**Date Submitted:**	03/01/2021
Client:	ATI, Inc.	**Job Location:**	John Carroll Elementary School	**Person Submitting:**	Mikal Frater
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-698	**Date Analyzed:**	03/02/2021
		P.O. Number:	Not Provided	**Report Date:**	03/03/2021
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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General Comments, Disclaimers, and Footnotes

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Sample Condition: Acceptable: The sample was collected and delivered to the our location without disturbing the material on the sampling media.
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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.
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*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): Tristan Ward

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.

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Chaetomium

Chaetomium is a genus of ascomycete fungi. It is a cosmopolitan, dark colored fungus (grayish-green to brown) commonly isolated from soil, seeds, dung, wood, and straw materials. Indoors, it is very commonly found on damp sheetrock and paper or cellulose-containing materials. There are certain characteristics such as color, shape, and size of the Chaetomium ascopores, asci, and ascomata that are unique in identification of the different species. Wind, insects, and water aid dispersal of spores. Due to their large size, they settle out of the air after just a few minutes. As a consequence, airborne mold levels are usually low even in infested environments. Due to this, exposure levels are likely to be low as well. Health Effects: Chaetomium does produce a variety of mycotoxins called chaetoglobsins, whose health effects on humans are unknown. Due to its toxigenic nature, special precautions may be required during remediation.

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.

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.

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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) 285348

Mailing/Billing Information:

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

Submittal Information:

1. Job Name: LAQ - PUCPS
2. Job Location: John Carroll ES
3. Job #: 20-698 P.O. #: _____
4. Contact Person: Mikal Frater Cell: (818) 702-8621
5. Collected by: " 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)
☐ 4 Hours
☐ Immediate Date Due: _____
☐ 24 Hours Time Due: _____
Comments: _____

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

REPORT TO:
● Email: Mikal@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: _____
Collection Media _____
● *Spore-Trap 3 (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	VOL (L)/ Wipe Area	ANALYSIS: ITEM	PCM	PLM	LEAD	MATRIX: MOLD	AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	CLIENT CONTACT (LABORATORY STAFF ONLY)
20-698 1	Parking Lot	2/27/21						✓	✓							Date/Time: Contact:By:
20-698 2	Blank	2/27/21						✓	✓							
20-698 3	Room 16	2/27/21						✓	✓							
																Date/Time: Contact:By:
																Date/Time: Contact:By:

	Print Name	Signature	Date	Time
Relinquished by:	Mikal Frater	Mikal Frater	3/1/21	11:40 AM
Received by:				
Relinquished by:				
Received for Lab by:			3/1/21	1200

Shipping Information
☐ UPS ☐ In-Person ☐ 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: R15046
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: Moran 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	70.72 (21.5)	°F (°C)
RELATIVE HUMIDITY	39.0	%RH
BAROMETRIC PRESSURE	29.15 (987.1)	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	70.9 (21.6)	70.8 (21.6)	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	29.22 (989.5)	29.23 (989.8)	28.64~29.80 (969.9~1009.1)				

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	01-24-20	07-31-20	DC Voltage	E003493	08-14-19	08-31-20

Chao Vang
CALIBRATED

June 15, 2020
DATE

DOC ID: CERT_GEN_VCC

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	70.68 (21.5)	°F (°C)
RELATIVE HUMIDITY	38.0	%RH
BAROMETRIC PRESSURE	29.16 (987.5)	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	70.8 (21.6)	71.1 (21.7)	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	29.22 (989.5)	29.17 (987.8)	28.64~29.80 (969.9~1009.1)				

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	01-24-20	07-31-20	DC Voltage	E003493	08-14-19	08-31-20

ChaoVang
VERIFIED

June 15, 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	74.0 (23.3)	°F (°C)
RELATIVE HUMIDITY	34	%RH
BAROMETRIC PRESSURE	29.20 (988.8)	inHg (hPa)

MODEL	982
SERIAL NUMBER	P17100007

☐ AS LEFT ☒ AS FOUND

☐ IN TOLERANCE ☒ 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	3015.3	* 2902.7	2924.9~3105.8
2	499	458	449~549	5	5056	* 4859.6	4904.3~5207.7
3	1002	963	952~1052				

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

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	35.1	* 29.5	32.1~38.1	2	100.5	* 84.8	97.5~103.5

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

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	32.1 (0.0)	32.8 (0.4)	31.1~33.1 (−0.5~0.6)	2	140.02 (60.01)	* 141.31 (60.73)	139.02~141.02 (59.45~60.57)

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

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	10.0	10.4	7.0~13.0	4	70.0	67.1	67.0~73.0
2	30.0	29.3	27.0~33.0	5	90.01	* 85.88	87.01~93.01
3	50.0	48.5	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
5000 CO_2	14A044095	04-06-20	04-06-25
N2	T-0608	05-19-20	05-19-28
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
Temperature	E010657	02-14-20	02-28-21
Temperture	E010655	01-21-20	01-31-21

Measurement Variable	System ID	Last Cal.	Cal. Due
200 CO	149886	04-30-20	03-24-28
Air	T17939	04-09-20	04-09-28
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
Temperature	E010658	02-14-20	02-28-21
Humidity	E003539	02-26-20	08-31-20

Chimoua Vue
VERIFIED

June 15, 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	70.41 (21.3)	°F (°C)
RELATIVE HUMIDITY	50.3	%RH
BAROMETRIC PRESSURE	29.15 (987.1)	inHg (hPa)

MODEL	982
SERIAL NUMBER	P17100007

☒ 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	32.1 (0.0)	31.9 (-0.1)	31.1~33.1 (-0.5~0.6)	2	140.0 (60.0)	140.3 (60.3)	139.0~141.0 (59.5~60.6)

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

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	10.0	9.0	7.8~12.2	4	70.0	69.5	67.8~72.2
2	30.0	29.1	27.8~32.2	5	90.0	88.7	87.8~92.2
3	50.0	49.6	47.8~52.2				

CO2 GAS VERIFICATION — SYSTEM G-101 — *Unit: ppm*

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	0	0	0~50	4	3016	3012	2926~3107
2	502	502	452~552	5	5056	5032	4904~5208
3	1005	1019	955~1055				

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 CO2	14A044095	04-06-20	04-06-25
N2	T-0608	05-19-20	05-19-28
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	02-26-20	08-31-20
200 CO	149886	04-30-20	03-24-28
Air	T17939	04-09-20	04-09-28
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

Chao Vang
CALIBRATED

June 16, 2020
DATE

Doc ID: CERT_GEN_WCC

TSI P/N 2300157