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February 26, 2021

Prince George's County Public Schools
13300 Old Marlboro Pike
Upper Marlboro Maryland 20722
Attention: Mr. Alex Baylor

RE: Indoor Air Quality Assessment, Thomas Stone Elementary School
Purchase Order: 734977
ATI Project Number: 20-712

Dear Mr. Baylor:

Prince George's County Public Schools requested that ATI, Inc., conduct a proactive indoor air quality (IAQ) assessment at Thomas Stone Elementary School on December 15, 2020 and a follow-up assessment on February 16, 2021. Their 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.

Brian Chapman
Industrial Hygienist

Reviewed By:

Nate Burgei, CIH, CSP
Certified Industrial Hygienist

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Indoor Air Quality Assessment Report

Prince George's County Public Schools
Thomas Stone Elementary School
4500 34th Street
Mt. Rainier, MD 20712

Prepared for:

Prince George's County Public Schools
13300 Old Marlboro Pike
Upper Marlboro, MD 20722

February 26, 2021

Submitted by:

ATI Job # 20-712

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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
SF^2	Square feet

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1 Executive Summary

ATI conducted a proactive Indoor Air Quality (IAQ) assessment on December 15, 2020, at Thomas Stone Elementary School, located at 4500 34th Street, Mt. Rainier, Maryland, and a follow-up assessment on February 16, 2021, in select rooms that had mold spore concentrations in the initial inspection that warranted corrective actions.

The initial assessment on December 15, 2020 included a visual assessment of randomly selected classrooms and other frequently occupied spaces, such as the cafeteria/gym, the main office, and randomly selected classrooms, for potential IAQ contributors and pathways. The Media Room, K-1 Room, Rooms 10 and 25, and the Band Room had unusually 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 repair any water issues discovered. As part of both assessments, ATI measured common IAQ comfort parameters, including temperature, relative humidity, carbon dioxide, and carbon monoxide. Also, ATI collected total fungal air samples on spore trap cassettes for microbiological analysis.

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

1. Three of the tested spaces had a temperature less than the ASHRAE recommended winter range of 68-75°F on December 15, 2020 and the three of the five reassessed spaces had temperatures below the ASHRAE recommended winter rages on February 16, 2021. This does not pose a concern since the building is not at full occupancy.
2. The relative humidity in all tested spaces on both December 15, 2020 and February 16, 2021 were less than the ASHRAE guidelines of <65%. Six locations were less than 30% during the initial assessment and all were within range during the follow up session. This is more likely due to low outdoor humidity on the initial day and higher levels on the follow up session.
3. Carbon dioxide concentrations in all tested spaces were less than the ASHRAE limit for carbon dioxide relative to the outdoor carbon dioxide concentration on the day of each assessment.
4. There were sagging ceiling tiles in Rooms K-1 and 25, and the VP office. Sagging tiles are typically an indication they have absorbed too much moisture over time. This is typical if moisture or humidity in a facility is not being properly regulated during the warmer months. Tiles holding moisture can also grow fungus overtime and can release spores into the air. Tiles should be removed and replaced with new tiles.
5. Repairs should be made to the leaking sink in Room K-1.
6. Carbon monoxide concentrations during both assessments were less than the ASHRAE/EPA recommended limit.
7. The spore trap sampling results from December 15, 2020 had unusual spore concentrations in the Media Room, K-1 Room, Rooms 10 and 25, and the Band Room. All areas were selected to be addressed and reassessed after remediation actions were completed. The other tested spaces had mold spore concentrations that were typical for occupied spaces.
8. The mold spore concentrations in the Media Room, K-1 Room, Rooms 10 and 25, and the Band Room during the February 16, 2021 reassessment were between 66-90% lower than the initial assessment, and any residual airborne mold spores are likely to be remnants that were not removed from the space after cleanup. ATI recommends an additional round of cleaning in the Media Room and Room 25 using HEPA vacuums and wet wiping to remove residual spores. Vacuum around the refrigerator coils in Room 25 to remove additional dusts and at main entrances/exits of building (emergency exits as well) where mold spores typically found on plant materials from the outdoors, like leaves, soil, detritus, may have blown in and settled. Consider placing a HEPA air scrubber overnight in Room 25 to drop mold spore levels.

2 Assessment Methods

Brian Chapman, Industrial Hygienist, of ATI, Inc. conducted the initial visual assessment and air sampling on December 15, 2020. Sampled rooms were randomly selected and accounted for approximately 10% of classrooms or a minimum of five

samples. Mr. Chapman documented visual observations at the time he collected the air samples. Mr. Chapman then conducted a follow-up inspection on February 16, 2021 in the Media Room, K-1 Room, Rooms 10 and 25, and the Band Room after the areas were treated for mold presence. ATI references the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) *Standard 62.1 – 2016* and ASHRAE *Standard 55 – 2017* when providing IAQ services to clients. ASHRAE is an industry leader on energy efficiency and indoor air quality.

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

Total fungal air samples were collected with a field calibrated Buck BioAire High-Volume Sampling Pump on Zefon Air-O-Cell spore-trap cassettes at a flow rate of 15 liters per minute for five minutes, for a sample volume of 75 liters. AMA Analytical Services, Inc. of Lanham, MD analyzed the samples using direct microscopic examination per the current ASTM D7391, which counts both viable and non-viable mold spores and particulates, which combined yields total fungal results. AMA participates in the National Institute of Standards and Technology's (NIST) National Voluntary Laboratory Accreditation Program (NVLAP) for general laboratory performance and management, and the American Industrial Hygiene Association (AIHA) for Environmental Microbial Laboratory Accreditation Program (EMLAP). The AMA laboratory reports are included in Appendix A.

3 Visual Observations

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

Table 1: Visual Observations and Sampling Locations

Sample Location	December 15, 2020 Observations
Parking Lot – Outside	• Partly cloudy skies • WNW Winds averaging 5MPH • No traffic – foot or vehicle • Sampling area was in a parking lot near residences and trees
Main Office	• No occupants in this area during sampling • There is no odor or visible mold in this area • Separate offices adjacent to the main office • No concerns to note at the time of sampling • One window convector unit • Main area is approximately 286 ft^2
VP Office	• One wall convector unit • Sagging ceiling tiles, which can be an indication of high moisture in the air during the summer months • Area is approximately 144 ft^2 of office space • Refrigerator and microwave in the office
Cafeteria	• Cafeteria also acts as an auditorium with a stage • There are six air-returns and four air-diffusers • Typical area for a cafeteria with a kitchen adjacent to the seating area, • Access to the outdoors • Two wall units for additional heating, which were off during sampling and unknown if they are still in operable condition

Sample Location	December 15, 2020 Observations
	• No odor or visible mold in this area • General seating area is approximately 2800 ft^2
Media Room	• There are two occupants in area during sampling • A sink in the adjacent media/server room is running from the cold water tap. IH checked under the sink for a shutoff valve but did not see one. Facilities was aware of the issue and a repair ticket was in place. • Two air-returns and six air-diffusers with two of them covered up • Sampled area is approximately 1428 ft^2
Room 10	• No occupants at the time of sampling • There is an emergency exit leading to the outdoors • One overhead air-return and six overhead air-diffusers • The room is approximately 768 ft^2 in size • No odor or visible mold in this area
Gymnasium	• There are two air-returns and six air-diffusers for temperature-controlled air circulation • Sufficient lighting in the area • No concerns to report • Heat appears to be set on high due to the temperature reaching up to 77°F
K-1 Room	• Sagging ceiling tiles, which can be an indication of too much moisture in the air during the summer months • All overhead HVAC system with no wall units • There are three air-returns and four air-diffusers • Area is approximately 1584 ft^2 in size, excluding the attached restroom • Dripping faucet in the restroom
Room 25	• One wall convector unit for heating. The unit is operating at the time of sampling and it sounds as if it requires maintenance by the sounds of the fans/belt drive. • Area is approximately 768 ft^2 in size • Ceiling tiles are sagging, which can be an indication of too much moisture in the air during the summer months • Old refrigerator with a lot of debris on the cooling coils in the rear, which can collect fungal spores and possible growth
Room 33	• HVAC system is overhead with one air-return and six air-diffusers • Area is approximately 880 sf^2 in size • Area appears to have been renovated within the past 1-3 years • One sink in the room but appears to be operating correctly
Band Room	• Area is three classroom size spaces into one with small rooms adjacent off the large, occupied area • The area has an abundance of cardboard boxes throughout the space, which has the potential to hold moisture if the air is not properly temperature controlled. • The HVAC system was off in the area during air sampling, which is why the temperature was only 57°F. This has been a common procedure to save on costs since the schools are not fully occupied due to the pandemic.
Sample Location	**February 16, 2021 Reassessment Observations**

Sample Location	December 15, 2020 Observations
Outdoors	• There were no occupants during the reassessment • Rain for several days prior to site visit and rain in the early morning of the day but tapered off prior to site visit • SW winds at 2 MPH, and dew point at 37° with rising pressure 29-68 and 86% humidity. • Outdoor sampling was taken in the area as the original sampling location on 12-16-20
Media Room	• Water spigot has been corrected and the water is no longer continuously running in the sink • All other parameters are the same as the previous site visit
K-1 Room	• Heat is off at the time of sampling procedure • All other appears to be the same as before • No new comments
Room 10	• Temperature and humidity are both in a comfort range according to ASHRAE guidelines • Area is vacant at the time of sampling • No concerns at the time of the survey
Room 25	• Area was not occupied at the time of the survey • Old refrigerator with a lot of debris on the cooling coils in the rear, which can collect fungal spores and possible growth • No other new comments at the time of the survey

4 Thermal Environmental Conditions for Human Occupancy

ASHRAE *Standard 55-2017, Thermal Environmental Conditions for Human Occupancy*, addresses thermal comfort in an office environment, which means that an employee wearing a normal amount of clothing feels neither too cold nor too warm. This standard discusses thermal comfort within the context of air temperature, humidity, and air movement and provides recommended ranges for temperature and humidity that are intended to satisfy 80% of occupants. The recommended ASHRAE ranges are referenced below by each comfort parameter.

4.1 Temperature

The ASHRAE standard establishes a winter comfort range of between 68°F and 75°F and a summer range of between 73°F and 79°F. The temperatures measured during the December 15, 2020 initial assessment and reassessment from February 16, 2021 are summarized in Table 2. As indicated by the data in the table, temperatures in the school on December 15 averaged between 57°F and 76°F, with three tested locations measuring less than the ASHRAE recommended winter range and one measuring just above the ASHRAE recommended range.

ATI reassessed select rooms that had unusual fungal spore concentrations on February 16, 2021, after remediation actions were completed. ATI also reassessed the temperature in the reassessed rooms. The average temperatures in the reassessed locations range from 58°F to 73°F, which is much less than the ASHRAE recommended winter temperature range; however, these spaces appeared to be unoccupied.

Table 2: Temperature

Sample Location	12/15/20 Initial Assessment Temperature in °F			ASHRAE Standard °F
	Min	Max	Average	
Outside	40	40	40	N/A
Indoors				
Main Office	71	71	71	68-75°F
VP Office	72	77	75	68-75°F
Cafeteria	69	73	71	68-75°F
Media Room	68	68	68	68-75°F
Room 10	68	70	69	68-75°F
Gymnasium	75	77	76	68-75°F
K-1 Room	60	60	60	68-75°F
Room 25	71	73	72	68-75°F
Room 33	60	60	60	68-75°F
Band Room	57	57	57	68-75°F
Sample Location	**02/16/2021 Reassessment Temperature in °F**			**ASHRAE Standard °F**
	Min	**Max**	**Average**	
Outdoors	40	40	40	N/A
Indoors				
Media Room	71	71	71	68-75°F
K-1 Room	58	58	58	68-75°F
Room 10	73	73	73	68-75°F
Room 25	67	67	67	68-75°F
Band Room	63	63	63	68-75°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 December 15, 2020 and February 16, 2021 are summarized in Table 3. As indicated by the data in the table, the average relative humidity ranged between 23% and 50% with all tested locations measuring less than the ASHRAE maximum recommendation of 65% relative humidity, and six locations less than 30% relative humidity.

ATI reassessed select rooms that had unusual fungal spore concentrations on February 16, 2021, after remediation actions were completed. ATI also reassessed the relative humidity in the space, and the average relative humidity ranged between 36% and 57% with all tested locations less than the ASHRAE maximum recommendation of 65% relative humidity, and greater than 30% relative humidity, which is optimal.

Table 3: Relative Humidity

Sample Location	12/15/20 Initial Assessment (% RH)			ASHRAE Standard (% RH)
	Min.	Max.	Avg.	
Outside	38	38	38	N/A
Indoors				
Main Office	39	39	39	< 65
VP Office	28	28	28	< 65
Cafeteria	31	33	32	< 65
Media Room	50	50	50	< 65
Room 10	28	32	30	< 65
Gymnasium	24	24	24	< 65
K-1 Room	24	24	24	< 65
Room 25	18	28	23	< 65
Room 33	24	28	26	< 65
Band Room	26	28	27	< 65
Sample Location	**02/16/2021 Reassessment (% RH)**			**ASHRAE Standard (% RH)**
	Min.	**Max.**	**Avg.**	
Outdoors	86	86	86	N/A
Indoors				
Media Room	57	57	57	< 65
K-1 Room	44	48	46	< 65
Room 10	37	37	37	< 65
Room 25	36	36	36	< 65
Band Room	39	39	39	< 65

4.3 Carbon Dioxide

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

Research has indicated that buildings with adequately operating ventilation systems are able to remove odors generated by activities in an indoor office environment efficiently. ASHRAE *Standard 62.1-2016* states that comfort (odor) criteria with respect to human bioeffluents are likely to be satisfied if the ventilation can maintain indoor carbon dioxide concentrations less than 700 parts per million (ppm) greater than the outdoor air concentration. Typically, outdoor carbon dioxide concentrations range from 300 ppm to 450 ppm, with the higher range typically found in urban areas during peak rush hour.

Carbon dioxide concentrations for December 15, 2020 are summarized in Table 4. On the day of the assessment, the average outdoor carbon dioxide concentration was 380 ppm, which calculates to a maximum indoor concentration of 1,080 ppm (700 + 380). 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 16, 2021, after remediation actions were completed. The carbon dioxide concentrations measured during the reassessment are included in Table 4. The average outdoor carbon dioxide concentration on February 16, 2021 was 399 ppm, which calculates to a maximum indoor

concentration of 1,099 ppm (700 + 399). All tested locations indoors were less than the recommended maximum for the day of the reassessment.

Table 4: Carbon Dioxide

Sample Location	12/15/20 Initial Assessment Concentration (parts per million)			ASHRAE Standard (ppm) NTE
	Min	Max	Average	
Outside	362	398	380	N/A
Indoors				
Main Office	405	415	410	< 1,080
VP Office	425	435	430	< 1,080
Cafeteria	410	416	413	< 1,080
Media Room	406	412	409	< 1,080
Room 10	406	452	429	< 1,080
Gymnasium	412	416	414	< 1,080
K-1 Room	404	410	408	< 1,080
Room 25	428	436	432	< 1,080
Room 33	400	410	405	< 1,080
Band Room	405	407	406	< 1,080
Sample Location	**02/16/2021 Reassessment Concentration (parts per million)**			**ASHRAE Standard (ppm) NTE**
	Min	**Max**	**Average**	
Outside	398	400	399	N/A
Indoors				
Media Room	464	500	482	< 1,099
K-1 Room	434	444	439	< 1,099
Room 10	452	454	453	< 1,099
Room 25	444	448	446	< 1,099
Band Room	458	460	459	< 1,099

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 December 15, 2020 were less than the Q-Trak's detection limit throughout the school.

ATI reassessed select rooms that had unusual fungal spore concentrations on February 16, 2016, after remediation actions were completed. The carbon monoxide concentrations measured during the reassessment are included in Table 5. The carbon monoxide concentrations from the reassessment were less than the EPA/ASHRAE recommended maximum of 9 ppm.

Table 5: Carbon Monoxide

Sample Location	12/15/20 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
VP Office	<3	<3	<3	< 9
Cafeteria	<3	<3	<3	< 9
Media Room	<3	<3	<3	< 9
Room 10	<3	<3	<3	< 9
Gymnasium	<3	<3	<3	< 9
K-1 Room	<3	<3	<3	< 9
Room 25	<3	<3	<3	< 9
Room 33	<3	<3	<3	< 9
Band Room	<3	<3	<3	< 9
Sample Location	**02/16/2021 Reassessment Concentration (parts per million)**			**ASHRAE Standard (ppm)**
	Min	**Max**	**Average**	
Outdoors	<3	<3	<3	N/A
Indoors				
Media Room	<3	<3	<3	< 9
K-1 Room	<3	<3	<3	< 9
Room 10	<3	<3	<3	< 9
Room 25	<3	<3	<3	< 9
Band Room	<3	<3	<3	< 9

5 Total Fungal Air Sampling Results

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

The December 15, 2020 and February 16, 2021 mold assessments sampled air using spore trap cassettes in randomly selected classrooms and other areas throughout the facility. These cassettes collect both viable spores, those capable of producing more fungal colonies, and non-viable spores, which cannot reproduce. Based upon recognized industry practices, indoor mold concentrations are compared with those detected outdoors, which are also known as ambient or baseline samples.

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

The results from December 15, 2020 suggested unusual mold spore concentrations in five tested locations: Media Room, K-1 Room, Rooms 10 and 25, and the Band Room. The *Aspergillus/Penicillium*-like concentration in the previously mentioned locations were greater than the outdoor sample which had a concentration of 416 spores/m^3. *Aspergillus/Penicillium* are two different mold genera but are grouped when analyzed via ASTM-D7391 due to their similar characteristics under a microscope. ATI recommended evaluating these tested spaces and the surrounding areas to try and identify water sources, abate any mold issues and clean the area before retesting the space.

Other tested rooms had low concentrations of spores that were not detected in the ambient sample, such as Rust*, Pithomyces,* and *Epicoccum*. However, the concentrations measured in those rooms do not suggest significant mold growth and could be residual spores from prior growth, contamination from outdoors, or possibly trivial amounts of mold growth normal in occupied spaces.

Media Room, K-1 Room, Rooms 10 and 25, and the Band Room were reassessed on February 16, 2021 after the initial assessment indicated the unusual presence of airborne mold spores. All areas retested had an *Aspergillus/Penicillium*-like airborne mold spore concentration reduction between 66% and 90% from the December 15, 2020 initial inspection. The Media Room and Room 25 both had *Aspergillus/Penicillium*-like concentration greater than 1,000 spores/m^3 which is slightly greater than the typical occupied space of around 1,000 spores/m^3 or less, but it is still a significant decrease from the December 15, 2020 assessment. The spores detected in the sample were likely residual mold spores that were not removed from the room during the first cleaning round.

Differences in concentrations between both dates of assessment are summarized in Table 6.

ATI recommends an additional round of cleaning in the Media Room and Room 25 using HEPA vacuums and wet wiping to remove residual spores. Vacuum around the refrigerator coils in Room 25 to remove additional dusts and at main entrances/exits of building (emergency exits as well) where mold spores typically found on plant materials from the outdoors, like leaves, soil, detritus, may have blown in and settled. Consider placing a HEPA air scrubber overnight in Room 25 to drop mold spore levels.

Table 6: *Aspergillus/Penicillium* spores/m^3 Concentration Comparison

Sample Location	December 15, 2020 Concentration	February 16, 2021 Concentrations	% Change
Media Room	4,056	1,378	-66
Room 10	6,180	848	-86
K-1 Room	1,820	212	-88
Room 25	21,684	2,067	-90
Band Room	1,664	371	-78

The official laboratory reports with spore trap samples collected on December 15, 2020 and February 16, 2021 are presented in Appendix A.

6 Summary of Findings

1. Three of the tested spaces had a temperature less than the ASHRAE recommended winter range of 68-75°F on December 15, 2020 and the three of the five reassessed spaces had temperatures below the ASHRAE recommended winter rages on February 16, 2021. This does not pose a concern since the building is not at full occupancy.

2. The relative humidity in all tested spaces on both December 15, 2020 and February 16, 2021 were less than the ASHRAE guidelines of <65%. Six locations were less than 30% during the initial assessment and all were within range during the follow up session. This is more likely due to low outdoor humidity on the initial day and higher levels on the follow up session.
3. Carbon dioxide concentrations in all tested spaces were less than the ASHRAE limit for carbon dioxide relative to the outdoor carbon dioxide concentration on the day of each assessment.
4. There were sagging ceiling tiles in Rooms K-1 and 25, and the VP office. Sagging tiles are typically an indication they have absorbed too much moisture over time. This is typical if moisture or humidity in a facility is not being properly regulated during the warmer months. Tiles holding moisture can also grow fungus overtime and can release spores into the air. Tiles should be removed and replaced with new tiles.
5. Repairs should be made to the leaking sink in Room K-1.
6. Carbon monoxide concentrations during both assessments were less than the ASHRAE/EPA recommended limit.
7. The spore trap sampling results from December 15, 2020 had unusual spore concentrations in the Media Room, K-1 Room, Rooms 10 and 25, and the Band Room. All areas were selected to be addressed and reassessed after remediation actions were completed. The other tested spaces had mold spore concentrations that were typical for occupied spaces.
8. The mold spore concentrations in the Media Room, K-1 Room, Rooms 10 and 25, and the Band Room during the February 16, 2021 reassessment were between 66-90% lower than the initial assessment, and any residual airborne mold spores are likely to be remnants that were not removed from the space after cleanup. ATI recommends an additional round of cleaning in the Media Room and Room 25 using HEPA vacuums and wet wiping to remove residual spores. Vacuum around the refrigerator coils in Room 25 to remove additional dusts and at main entrances/exits of building (emergency exits as well) where mold spores typically found on plant materials from the outdoors, like leaves, soil, detritus, may have blown in and settled. Consider placing a HEPA air scrubber overnight in Room 25 to drop mold spore levels.

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

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: 327143
Client: ATI, Inc.
Address: 9220 Rumsey Road
Suite 100
Columbia, MD 21045
Attention: Brian Chapman

Job Name: Thomas Stone Elementary School
Job Location: 4500 34th Street. Mount Rainer, MD
Job Number: 20-712
P.O. Number: Not Provided

Date Submitted: 12/15/2020
Person Submitting: Brian Chapman
Date Analyzed: 12/16/2020
Report Date: 12/17/2020

AMA Sample #	327143-1
Client ID	20-712-01
Analyst ID	TLW
Collection Apparatus	Air-O-Cell
Sample Volume (L)	75
Sample Condition	Acceptable
Debris Loading	2
Location	Outside

	Raw Ct	Trav/Flds	A.S.	sp/m^3	%
Alternaria	Present	15	52	<52	
Ascospores					
Basidiospores	6	15	52	312	54.5%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	3	15	52	156	27.3%
Curvularia					
Penicillium / Aspergillus	1	15	52	52	9.1%
Smuts/Periconia/Myxomycetes	1	15	52	52	9.1%
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Rusts					
Other Colorless					
Epicoccum					
Pithomyces					
Hyphal Fragments*					
Total Raw Ct:	11		**Total sp/m^3:**	572	

Comments

AMA Sample #	327143-2
Client ID	20-712-02
Analyst ID	TLW
Collection Apparatus	Air-O-Cell
Sample Volume (L)	75
Sample Condition	Acceptable
Debris Loading	1
Location	Blank

	Raw Ct	Trav/Flds	A.S.	sp/m^3	%
Alternaria					
Ascospores					
Basidiospores					
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium					
Curvularia					
Penicillium / Aspergillus					
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Rusts					
Other Colorless					
Epicoccum					
Pithomyces					
Hyphal Fragments*					
Total Raw Ct:	0		**Total sp/m^3:**	0	

Comments
No mold spores observed.

AMA Sample #	327143-3
Client ID	20-712-03
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/m^3	%
Alternaria					
Ascospores					
Basidiospores	3	15	52	156	37.5%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	1	15	52	52	12.5%
Curvularia					
Penicillium / Aspergillus	3	15	52	156	37.5%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown	1	15	52	52	12.5%
Rusts	Present	15	52	<52	
Other Colorless					
Epicoccum					
Pithomyces					
Hyphal Fragments*	1	15	52	52	12.5%
Total Raw Ct:	8		**Total sp/m^3:**	416	

Comments

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	327143	**Job Name:**	Thomas Stone Elementary School	**Date Submitted:**	12/15/2020
Client:	ATI, Inc.	**Job Location:**	4500 34th Street. Mount Rainer, MD	**Person Submitting:**	Brian Chapman
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-712	**Date Analyzed:**	12/16/2020
		P.O. Number:	Not Provided	**Report Date:**	12/17/2020
Attention:	Brian Chapman				

AMA Sample #	327143-4	**AMA Sample #**	327143-5	**AMA Sample #**	327143-6
Client ID	20-712-04	**Client ID**	20-712-05	**Client ID**	20-712-06
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)**	75	**Sample Volume (L)**	75
Sample Condition	Acceptable	**Sample Condition**	Acceptable	**Sample Condition**	Acceptable
Debris Loading	2	**Debris Loading**	2	**Debris Loading**	2
Location	Vice Principal Office	**Location**	Cafeteria	**Location**	Media Room

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores					
Basidiospores	2	15	52	104	18.2%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	1	15	52	52	9.1%
Curvularia					
Penicillium / Aspergillus	8	15	52	416	72.7%
Smuts/Periconia/Myxomycetes	Present	15	52	<52	
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Rusts	Present	15	52	<52	
Other Colorless					
Epicoccum					
Pithomyces					
Hyphal Fragments*					
Total Raw Ct:	11	**Total sp/m³:**	572		

Comments

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores					
Basidiospores	2	15	52	104	5.1%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	26	15	52	1352	66.7%
Curvularia					
Penicillium / Aspergillus	10	15	52	520	25.6%
Smuts/Periconia/Myxomycetes	1	15	52	52	2.6%
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Rusts					
Other Colorless					
Epicoccum					
Pithomyces					
Hyphal Fragments*					
Total Raw Ct:	39	**Total sp/m³:**	2028		

Comments

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	2	15	52	104	1.7%
Basidiospores	14	15	52	728	12%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	15	15	52	780	12.8%
Curvularia					
Penicillium / Aspergillus	78	15	52	4056	66.7%
Smuts/Periconia/Myxomycetes	6	15	52	312	5.1%
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Rusts					
Other Colorless	2	15	52	104	1.7%
Epicoccum					
Pithomyces					
Hyphal Fragments*					
Total Raw Ct:	117	**Total sp/m³:**	6084		

Comments

AMA Analytical Services, Inc.
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CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	327143	**Job Name:**	Thomas Stone Elementary School	**Date Submitted:**	12/15/2020
Client:	ATI, Inc.	**Job Location:**	4500 34th Street. Mount Rainer, MD	**Person Submitting:**	Brian Chapman
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-712	**Date Analyzed:**	12/16/2020
		P.O. Number:	Not Provided	**Report Date:**	12/17/2020
Attention:	Brian Chapman				

AMA Sample #	327143-7	**AMA Sample #**	327143-8	**AMA Sample #**	327143-9
Client ID	20-712-07	**Client ID**	20-712-08	**Client ID**	20-712-09
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)**	75	**Sample Volume (L)**	75
Sample Condition	Acceptable	**Sample Condition**	Acceptable	**Sample Condition**	Acceptable
Debris Loading	2	**Debris Loading**	3	**Debris Loading**	2
Location	Room 10	**Location**	Gym	**Location**	Room H-K1

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	1	15	52	52	0.9%
Basidiospores	10	15	52	520	8.7%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	1	15	52	52	0.9%
Curvularia					
Penicillium / Aspergillus	103	13	60	6180	89.6%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Rusts					
Other Colorless					
Epicoccum					
Pithomyces					
Hyphal Fragments*	1	15	52	52	0.9%
Total Raw Ct:	115		**Total sp/m³:**	6804	

Comments

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	1	15	52	52	3.6%
Basidiospores					
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	10	15	52	520	35.7%
Curvularia					
Penicillium / Aspergillus	17	15	52	884	60.7%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Rusts	Present	15	52	<52	
Other Colorless					
Epicoccum					
Pithomyces					
Hyphal Fragments*	2	15	52	104	7.1%
Total Raw Ct:	28		**Total sp/m³:**	1456	

Comments

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores					
Basidiospores	1	15	52	52	2.8%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium					
Curvularia					
Penicillium / Aspergillus	35	15	52	1820	97.2%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Rusts					
Other Colorless					
Epicoccum					
Pithomyces					
Hyphal Fragments*					
Total Raw Ct:	36		**Total sp/m³:**	1872	

Comments

AMA Analytical Services, Inc.
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CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody: 327143
Client: ATI, Inc.
Address: 9220 Rumsey Road
Suite 100
Columbia, MD 21045
Attention: Brian Chapman

Job Name: Thomas Stone Elementary School
Job Location: 4500 34th Street. Mount Rainer, MD
Job Number: 20-712
P.O. Number: Not Provided

Date Submitted: 12/15/2020
Person Submitting: Brian Chapman
Date Analyzed: 12/16/2020
Report Date: 12/17/2020

AMA Sample #	327143-10
Client ID	20-712-10
Analyst ID	TLW
Collection Apparatus	Air-O-Cell
Sample Volume (L)	75
Sample Condition	Acceptable
Debris Loading	2
Location	Room 25

	Raw Ct	Trav/Flds	A.S.	sp/m^3	%
Alternaria					
Ascospores	1	15	52	52	0.5%
Basidiospores	7	15	52	364	3.6%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	47	15	52	2444	23.9%
Curvularia					
Penicillium / Aspergillus	139	5	156	21684	70.6%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown	2	15	52	104	1%
Rusts					
Other Colorless					
Epicoccum	1	15	52	52	0.5%
Pithomyces					
Hyphal Fragments*	1	15	52	52	0.5%

Total Raw Ct: 197 **Total sp/m^3:** 24700

Comments

AMA Sample #	327143-11
Client ID	20-712-11
Analyst ID	TLW
Collection Apparatus	Air-O-Cell
Sample Volume (L)	75
Sample Condition	Acceptable
Debris Loading	1
Location	Room 33

	Raw Ct	Trav/Flds	A.S.	sp/m^3	%
Alternaria					
Ascospores					
Basidiospores	2	15	52	104	25%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	2	15	52	104	25%
Curvularia					
Penicillium / Aspergillus	3	15	52	156	37.5%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown	1	15	52	52	12.5%
Rusts					
Other Colorless					
Epicoccum					
Pithomyces					
Hyphal Fragments*					

Total Raw Ct: 8 **Total sp/m^3:** 416

Comments

AMA Sample #	327143-12
Client ID	20-712-12
Analyst ID	TLW
Collection Apparatus	Air-O-Cell
Sample Volume (L)	75
Sample Condition	Acceptable
Debris Loading	2
Location	Band Room

	Raw Ct	Trav/Flds	A.S.	sp/m^3	%
Alternaria					
Ascospores	1	15	52	52	2.8%
Basidiospores					
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	1	15	52	52	2.8%
Curvularia					
Penicillium / Aspergillus	32	15	52	1664	88.9%
Smuts/Periconia/Myxomycetes	2	15	52	104	5.6%
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Rusts					
Other Colorless					
Epicoccum					
Pithomyces	Present	15	52	<52	
Hyphal Fragments*					

Total Raw Ct: 36 **Total sp/m^3:** 1872

Comments

AMA Analytical Services, Inc.
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CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	327143	**Job Name:**	Thomas Stone Elementary School	**Date Submitted:**	12/15/2020
Client:	ATI, Inc.	**Job Location:**	4500 34th Street. Mount Rainer, MD	**Person Submitting:**	Brian Chapman
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-712	**Date Analyzed:**	12/16/2020
		P.O. Number:	Not Provided	**Report Date:**	12/17/2020
Attention:	Brian Chapman				

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.
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CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	327143	**Job Name:**	Thomas Stone Elementary School	**Date Submitted:**	12/15/2020
Client:	ATI, Inc.	**Job Location:**	4500 34th Street. Mount Rainer, MD	**Person Submitting:**	Brian Chapman
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	20-712	**Date Analyzed:**	12/16/2020
		P.O. Number:	Not Provided	**Report Date:**	12/17/2020
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): Tristan Ward

Technical Director Tristan Ward

MOLD SPORE DESCRIPTIONS

Alternaria

Alternaria is ubiquitous in the environment and are normal agents of decay and decomposition. The spores are airborne and common outdoors than indoors isolated from plants, soil, and food. Indoors, the spores are found in house dust, carpets, textiles, wallboard and window frames. The production of melanin-like pigment is one of its major identifying characteristics. The club-shaped spores (conidia) are single or in long chains. They can grow thick colonies with grayish-white surfaces at the beginning which later darken to greenish black or olive brown colors. Health Effects: Allergies are common, but serious infections are rare, except in people with compromised immune systems. Certain species of this genus are often prolific producers of a variety of toxic compounds whose effects on human health are not well known.

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.

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.

Pithomyces

Pithomyces is a cosmopolitan, dark-walled fungus often found growing outside in soil, decaying leaves, and grasses. It is rarely found growing indoors, but will grow on paper given the right conditions. Colonies grow rapidly, cottony in texture with light to dark brownish black surface color. Spores are single, oval yellow to dark brown, multi-celled, and usually rough. One identification feature of the spores is the resemblance to barrels. Another identifying character is beak-like structures on young spores. Spores of Pithomyces chartarum are most common and are identified by distinctive tranverse septa. This species has been linked to facial eczema in sheep. Health Effects: It is a potential but not well-studied allergen or human pathogen.

Rusts

Rusts are of the order Uredinales. Certain species produce spores that are often reddish in color and resemble the corrosion process known as rust. This is how this group derived its common name-Rusts. The spores are airborne and can travel long distances. Some spores slightly resemble Smuts. Rusts are plant parasites and may require two or more different plant hosts to complete their life cycle. Their complex life cycle includes production of five different spore stages. Their infection rate is enhanced by wet weather. Health Effects: Rusts can cause allergen type I allergies (hay fever, asthma). No human infection and known toxins have been reported.

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) 327143

Mailing/Billing Information:
1. Client Name: ATI Inc
2. Address 1: 4221 Forbes Blvd
3. Address 2: Ste 290
4. Address 3: Lanham, MD 20706
5. Phone #: _____ Fax #: _____

Submittal Information:
1. Job Name: Thomas Stone ES. (Please also send to Courtney McCall.)
2. Job Location: 4500 34TH St. M. Rainer, MD
3. Job #: 20-712 P.O. #: _____
4. Contact Person: Brian Chapman Cell: 202-368-1376
5. Collected by: Brian Chapman 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 to contacts on file.

AFTER HOURS (must be pre-scheduled)	NORMAL BUSINESS HOURS	REPORT TO:
❑ 4 Hours ❑ Late Night ❑ Immediate Date Due: _____ ❑ 24 Hours Time Due: _____ Comments: _____	❑ 4 Hours ❑ 3 Day ❑ Same Day ☒ 5 Day + Date Due: 12/23/20 ❑ Next Day ☒ Results Required By Noon (Additional fee may apply) ❑ 2 Day	❑ Email: _____ ❑ 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
❑ Asbestos Soil ASTM D7521 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)
❑ Vermiculite _____ (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.
Lab use only (TEM Water samples _____ °C)

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

Metals Analysis
❑ Pb Paint Chip ❑ % by Weight ____ (QTY) ❑ mg/cm² ____ (QTY)
❑ *Pb Dust Wipe (wipe type _____) _____ (QTY)
❑ *Pb Air _____ (QTY)
❑ Pb Soil/Solid _____ (QTY)
❑ Pb TCLP _____ (QTY)
❑ Drinking Water ❑ Pb ____ (QTY) ❑ Cu ____ (QTY)
❑ Waste Water ❑ Pb ____ (QTY) ❑ Cu ____ (QTY)
❑ Pb Furnace (Media _____) _____ (QTY)

Fungal Analysis
Collection Apparatus for Spore Traps/Air Samples: _____
Collection Media _____
☒ *Spore-Trap 13 (QTY) ❑ Surface Vacuum Dust ____ (QTY)
❑ *Surface Swab ____ (QTY)
❑ *Surface Tape ____ (QTY)
❑ Other (Specify ____) ____ (QTY)

SAMPLE INFORMATION CLIENT ID #	SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	ANALYSIS TEM	PCM	PLM	LEAD	MOLD	MATRIX AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	COMMENTS / SPECIAL INSTRUCTIONS
20-712-01	outside	12-15-20 1:17pm	754										X			
20-712-02	BLANK	12-15-20	n/a													
20-712-03	main office	1:41														
20-712-04	VP. office	1:48														
20-712-05	Cafeteria	1:55														
20-712-06	media RM	2:02														
20-712-07	Rm 10	2:15														
20-712-08	Gym	2:23														
20-712-09	Rm. H-K 1	2:30														
20-712-10	Rm 25	2:42														
20-712-11	Rm 33	2:50														
20-712-12	Band Rm.	3:02														

	Print Name	Signature	Date	Time
Relinquished by:	Brian Chapman		12-15-20	4:25
Received by:			12/15/20	1645

Shipping Information: ☐ UPS ☒ In-Person ☐ Other ☐ FedEx ☐ Drop Box ☐ USPS ☐ Courrier

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	294977	**Job Name:**	Thomas Stone Elementary School	**Date Submitted:**	02/16/2021
Client:	ATI, Inc.	**Job Location:**	4500 34th Street 20-712	**Person Submitting:**	Brian Chapman
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	Not Provided	**Date Analyzed:**	02/17/2021
		P.O. Number:	Not Provided	**Report Date:**	02/17/2021
Attention:	Brian Chapman				

AMA Sample #	294977-1	**AMA Sample #**	294977-2	**AMA Sample #**	294977-3
Client ID	20-712-01B	**Client ID**	20-712-02B	**Client ID**	20-712-03B
Analyst ID	MG	**Analyst ID**	MG	**Analyst ID**	MG
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	2	**Debris Loading**	1	**Debris Loading**	1
Location	Outside	**Location**	Blank	**Location**	Media Rm

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	26	15	53	1378	76.5%
Basidiospores	6	15	53	318	17.6%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium					
Curvularia					
Penicillium / Aspergillus	2	15	53	106	5.9%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	34	**Total sp/m³:**	1802		

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					
Basidiospores	6	15	53	318	17.6%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	2	15	53	106	5.9%
Curvularia					
Penicillium / Aspergillus	26	15	53	1378	76.5%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*	1	15	53	53	2.9%
Total Raw Ct:	34	**Total sp/m³:**	1802		

Comments

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	294977	**Job Name:**	Thomas Stone Elementary School	**Date Submitted:**	02/16/2021
Client:	ATI, Inc.	**Job Location:**	4500 34th Street 20-712	**Person Submitting:**	Brian Chapman
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	Not Provided	**Date Analyzed:**	02/17/2021
		P.O. Number:	Not Provided	**Report Date:**	02/17/2021
Attention:	Brian Chapman				

AMA Sample #	294977-4	**AMA Sample #**	294977-5	**AMA Sample #**	294977-6
Client ID	20-712-04B	**Client ID**	20-712-05B	**Client ID**	20-712-06B
Analyst ID	MG	**Analyst ID**	MG	**Analyst ID**	MG
Collection Apparatus	Air-O-Cell	**Collection Apparatus**	Air-O-Cell	**Collection Apparatus**	Air-O-Cell
Sample Volume (L)	75	**Sample Volume (L)**	75	**Sample Volume (L)**	75
Sample Condition	Acceptable	**Sample Condition**	Acceptable	**Sample Condition**	Acceptable
Debris Loading	1	**Debris Loading**	2	**Debris Loading**	1
Location	# K1	**Location**	Rm 10	**Location**	Rm 25

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	4	15	53	212	44.4%
Basidiospores	1	15	53	53	11.1%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium					
Curvularia					
Penicillium / Aspergillus	4	15	53	212	44.4%
Smuts/Periconia/Myxomycetes					
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	9	**Total sp/m³:**	477		

Comments

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	10	15	53	530	28.6%
Basidiospores	7	15	53	371	20%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	1	15	53	53	2.9%
Curvularia					
Penicillium / Aspergillus	16	15	53	848	45.7%
Smuts/Periconia/Myxomycetes	1	15	53	53	2.9%
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	35	**Total sp/m³:**	1855		

Comments

	Raw Ct	Trav/Flds	A.S.	sp/m³	%
Alternaria					
Ascospores	13	15	53	689	18.8%
Basidiospores	8	15	53	424	11.6%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium	6	15	53	318	8.7%
Curvularia					
Penicillium / Aspergillus	39	15	53	2067	56.5%
Smuts/Periconia/Myxomycetes	3	15	53	159	4.3%
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	69	**Total sp/m³:**	3657		

Comments

AMA Analytical Services, Inc.
Focused On Results.

CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody: 294977
Client: ATI, Inc.
Address: 9220 Rumsey Road
Suite 100
Columbia, MD 21045
Attention: Brian Chapman

Job Name: Thomas Stone Elementary School
Job Location: 4500 34th Street 20-712
Job Number: Not Provided
P.O. Number: Not Provided

Date Submitted: 02/16/2021
Person Submitting: Brian Chapman
Date Analyzed: 02/17/2021
Report Date: 02/17/2021

AMA Sample # 294977-7
Client ID 20-712-07B
Analyst ID MG
Collection Apparatus Air-O-Cell
Sample Volume (L) 75
Sample Condition Acceptable
Debris Loading 1
Location Band Rm

	Raw Ct	Trav/Flds	A.S.	sp/m^3	%
Alternaria					
Ascospores	2	15	53	106	14.3%
Basidiospores	2	15	53	106	14.3%
Bipolaris/Drechslera/Helm.					
Chaetomium					
Cladosporium					
Curvularia					
Penicillium / Aspergillus	7	15	53	371	50%
Smuts/Periconia/Myxomycetes	3	15	53	159	21.4%
Stachybotrys/Memnoniella					
Ulocladium					
Unknown					
Hyphal Fragments*					
Total Raw Ct:	14		**Total sp/m^3:**		742

Comments

AMA Analytical Services, Inc.
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CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	294977	**Job Name:**	Thomas Stone Elementary School	**Date Submitted:**	02/16/2021
Client:	ATI, Inc.	**Job Location:**	4500 34th Street 20-712	**Person Submitting:**	Brian Chapman
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	Not Provided	**Date Analyzed:**	02/17/2021
		P.O. Number:	Not Provided	**Report Date:**	02/17/2021
Attention:	Brian Chapman				

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.
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CERTIFICATE OF ANALYSIS

ASTM D7391-09 Spore Trap Analysis Report

Chain of Custody:	294977	**Job Name:**	Thomas Stone Elementary School	**Date Submitted:**	02/16/2021
Client:	ATI, Inc.	**Job Location:**	4500 34th Street 20-712	**Person Submitting:**	Brian Chapman
Address:	9220 Rumsey Road Suite 100 Columbia, MD 21045	**Job Number:**	Not Provided	**Date Analyzed:**	02/17/2021
		P.O. Number:	Not Provided	**Report Date:**	02/17/2021
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): Michael Greenberg

Technical Director Tristan Ward

MOLD SPORE DESCRIPTIONS

Ascospores

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

Basidiospores

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

Cladosporium

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

Hyphal Fragments

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

Penicillium/Aspergillus Like

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

Smuts/Periconia/Myxomycetes

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

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

CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 294977

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: Thomas Stone ES.
2. Job Location: 4500 34th St.
3. Job #: 20-712 P.O. #: _____
4. Contact Person: Brian Chapman Cell: 202-368-1376
5. Collected by: Brian 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 ☐ Late Night
☐ 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: 2-17-21
☐ 2 Day

REPORT TO:
☑ 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
☐ 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)
☐ Vermiculite
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 7 (QTY) ☐ Surface Vacuum Dust_____ (QTY)
☐ *Surface Swab_____(QTY)
☐ *Surface Tape_____ (QTY)
☐ Other (Specify_____)_____ (QTY

CLIENT ID #	SAMPLE INFORMATION SAMPLE LOCATION/ ID	DATE/ TIME	VOL (L)/ Wipe Area	ANALYSIS TEM	PCM	PLM	LEAD	MOLD	MATRIX AIR	BULK	DUST	WATER AND OTHER	SPORE TRAP	TAPE	SWAB	COMMENTS / SPECIAL INSTRUCTIONS
20-712-01B	outside	2-16-21	75L					✓	✓							10:36
20-712-02B	Blank		n/a													~~10:41~~
20-712-03B	Media RM		75L													10:44
20-712-04B	# K1		75L													10:54
20-712-05B	RM. 1D		75L													11:04
20-712-06B	RM 25		75L													11:12
20-712-07B	Band RM		75L													11:20

	Print Name	Signature	Date	Time	Shipping Information
Relinquished by:	Brian Chapman		2-16-21	1:48	☐ UPS ☑ In-Person ☐ Other
Received by:			2/16/21	1350	☐ FedEx ☐ Drop Box ☐ USPS ☐ Courrier

Appendix B: Instrument Calibration Records

Certificate of Calibration

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

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

Flow Calibration

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

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

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

QA Approval By: Moroni Menk

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

BUCK

CERTIFICATE OF CALIBRATION AND TESTING

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

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

MODEL	7575-X
SERIAL NUMBER	7575X1711004

☒ AS LEFT ☐ AS FOUND

☒ IN TOLERANCE ☐ OUT OF TOLERANCE

– CALIBRATION VERIFICATION RESULTS –

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

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

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

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

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

Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E004626	02-14-20	02-28-21	Pressure	E005254	10-10-19	10-31-20
Pressure	E003982	07-21-20	01-31-21	DC Voltage	E003493	06-17-20	06-30-21

CALIBRATED

August 31, 2020
DATE

Doc. ID: CERT_GEN_WCC

TSI P/N 2300157

CERTIFICATE OF CALIBRATION AND TESTING

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

ENVIRONMENT CONDITIONS		
TEMPERATURE	71.24 (21.8)	°F (°C)
RELATIVE HUMIDITY	54.8	%RH
BAROMETRIC PRESSURE	28.74 (973.2)	inHg (hPa)

MODEL	7575-X
SERIAL NUMBER	7575X1711004

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

– CALIBRATION VERIFICATION RESULTS –

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

#	STANDARD	MEASURED	ALLOWABLE RANGE	#	STANDARD	MEASURED	ALLOWABLE RANGE
1	70.8 (21.6)	70.5 (21.4)	68.8~72.8 (20.4~22.7)				

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

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

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Measurement Variable	System ID	Last Cal.	Cal. Due	Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E004626	02-14-20	02-28-21	Pressure	E005254	10-10-19	10-31-20
Pressure	E003982	07-21-20	01-31-21	DC Voltage	E003493	06-17-20	06-30-21

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

MODEL	982
SERIAL NUMBER	P17100006

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

– CALIBRATION VERIFICATION RESULTS –

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

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

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

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

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

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

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

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

**Indicates Out-of-Tolerance Condition*

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

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VERIFIED

August 31, 2020
DATE

DOC ID CERT_GEN_WCC

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

MODEL	982
SERIAL NUMBER	P17100006

☒ AS LEFT ☐ AS FOUND

☒ IN TOLERANCE ☐ OUT OF TOLERANCE

– CALIBRATION VERIFICATION RESULTS –

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

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

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

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

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

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

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

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

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Measurement Variable	System ID	Last Cal.	Cal. Due
Temperature	E010657	02-14-20	02-28-21
Temperture	E010655	01-21-20	01-31-21
5000 CO_2	T-0660	07-15-20	07-15-28
N_2	CT308798	06-28-20	06-28-28
Flow	E003341	09-03-19	09-30-20
Flow	E003525	01-06-20	01-31-21
2000 C4H8	EB0054467	08-13-19	08-12-22

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

Bao Yang
CALIBRATED

August 31, 2020
DATE

Doc. ID. CERT_GEN_WCC

TSI P/N 2300157