

**SPORE SAMPLING REPORT  
FOR  
GLENWOOD MIDDLE SCHOOL  
2680 ROUTE 97  
GLENWOOD, MD 21738**

**PREPARED FOR:**

**HOWARD COUNTY PUBLIC SCHOOL SYSTEM  
10910 ROUTE 108  
ELLICOTT CITY, MD 21043**

**PREPARED BY:**



**ARIA ENVIRONMENTAL, INC.  
PO BOX 286  
WOODBINE, MD 21797**

**SEPTEMBER 18, 2015**

**150876**

**SPORE TRAP SAMPLING REPORT  
FOR GLENWOOD MIDDLE SCHOOL  
SEPTEMBER 9, 2015**

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**SPORE TRAP SAMPLING REPORT  
FOR GLENWOOD MIDDLE SCHOOL  
SEPTEMBER 9, 2015**

**EXECUTIVE SUMMARY**

Aria Environmental, Inc. (AE) was contracted by Howard County Public School System to perform spore trap sampling at the Glenwood Middle School at the end of August 2015 due to air quality concerns expressed by staff and parents and to monitor the school after a recent heating, ventilation and air-conditioning (HVAC) system upgrade. AE made measurements for temperature, humidity, carbon monoxide, carbon dioxide and particulate matter and collected microbial spore trap sampling for fungal spore identification and counting on September 9, 2015 as part of a series of spore sampling events that will occur in the first month of the 2015 - 2016 school year and less frequently throughout the school year. This report presents the results of air sampling made on September 9, 2015.

**Spore Trap Sampling Report  
For Glenwood Middle School  
September 9, 2015**

**I. BACKGROUND**

Representatives from Aria Environmental, Inc. (AE) visited Glenwood Middle School on September 9, 2015 to perform air monitoring in response to an ongoing indoor air quality complaint at the school. Measurements for temperature, humidity, carbon monoxide, carbon dioxide and particulate matter and microbial spore trap sampling were collected from classrooms 3, 11, 12, 15, 20, 29, 30, 34, Music Classroom 37, and portable classrooms 60, 61, 70, 71, 80 and 81. Outdoor air samples were also collected for comparison purposes in one courtyard and outside near portable storage room 80. This monitoring was performed in response to employee and parental complaints and as a follow up to HVAC improvements.

There was no visible evidence of mold growth nor observed odors consistent with mildew in the classrooms sampled. Weather on the day of monitoring was warm and sunny.

**II. OBSERVATIONS AND MEASUREMENTS**

**A. Observations and Measurements on September 9, 2015**

Industry guidelines or standards for seasonal temperature and humidity ranges for thermal comfort are established by the American Society for Heating, Refrigerating and Air Conditioning Engineers (ASHRAE) standard 55-2013. These ranges are presented in Table 1. The room air temperature measured between 3:00 PM and 5:00 PM ranged from 74.0 to 81.6° F with an average of 76.1° F. The indoor relative humidity ranged from 44.6 to 70.6 percent. The temperature and relative humidity measurements are considered acceptable for summer thermal comfort in all rooms except Room 80 where the temperature and humidity were 81.6° F and 70.6%. Room 80 is a portable classroom that is being used as storage. The air-conditioning and ventilation system in this room did not appear to be operating. Results of temperature, relative humidity, carbon dioxide and carbon monoxide monitoring are presented in Table 2.

**Table 1- Acceptable Ranges of Temperature and Relative Humidity in Summer and Winter<sup>a</sup>**

<b>Relative Humidity</b>	<b>Winter Temperature</b>	<b>Summer Temperature</b>
30%	68.5°F – 76.0°F	74.0°F – 80°F
40%	68.5°F - 75.5°F	73.5°F – 79.5°F
50%	68.5°F - 74.5°F	73.0°F – 79.0°F
60%	68.0°F - 74.0°F	72.5°F – 78.0°F

<sup>a</sup>adapted from ASHRAE Standard 55-2013

The outside temperature at 5:01 PM was 94.1° F and the outdoor relative humidity was 39.6% outside near Portable Classroom 80, and the outside temperature at 4:54 PM was 89.9° F and the relative humidity was 41.1% in the courtyard between classrooms 5 and 18. No windows or doors were observed to be open during the monitoring period. The U.S. Environmental Protection Agency (EPA) recommends maintaining indoor relative humidity below 60% and ideally between 30 and 50%. The indoor humidity measurements were within the ranges recommended for thermal comfort except for the one measurement (70.6%) in portable storage room 80. The school was on a summer cooling schedule at the time of monitoring.

Carbon dioxide and carbon monoxide measurements are used to assess ventilation system performance. The exhaled breath of building occupants is the main indoor source of carbon dioxide; therefore, the build-up of carbon dioxide indicates inadequate ventilation. Air

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monitoring was performed after school hours when the rooms were mostly unoccupied. Carbon dioxide concentrations ranged from 356 to 895 ppm indoors. The concentration of concern for carbon dioxide is set by ASHRAE standard 62.1–2013 as 700 ppm above outdoor air. On the day of monitoring, the outdoor air concentration of carbon dioxide ranged from 372 to 808 ppm. Carbon dioxide concentrations were within the comfort parameters established by ASHRAE.

Carbon monoxide is mainly attributed to incomplete combustion. Concentrations of CO ranged from 0.2 to 0.5 ppm indoors and the outdoor concentrations was 0.0 ppm in the two outdoor locations measured. CO concentrations were below the ASHRAE concentration of concern of 9 ppm.

Particulate matter or PM is the term for a mixture of solid particles and liquid droplets found in the air. It does not distinguish between the types of particles in the air (e.g., pollen, skin cells, mold spores, soil, etc.). Particulate matter includes "inhalable coarse particles," with diameters larger than 2.5 micrometers and smaller than 10 micrometers (PM 10) and "fine particles," with diameters that are 2.5 micrometers and smaller (PM 2.5). Particle loads expected to be a part of the school environment include carpet and clothing fiber, soil tracked from outside, paper dust, chalk dust, and dust and fibers from building materials. ASHRAE Standard 62.1–2013 suggests target indoor concentrations for PM 2.5 and PM 10 of 15  $\mu\text{g}/\text{m}^3$  and 50  $\mu\text{g}/\text{m}^3$ , respectively. These concentrations are taken from the EPA's National Ambient Air Quality Standards (NAAQS) based on annual arithmetic means deemed acceptable for outdoor air quality. Occupational standards and guidelines for particles are nearly an order of magnitude higher than concentrations typically found in non-occupational settings and are not appropriate for comparison.

Particle measurements were taken with an Aerocet 531 particulate monitor. The particle monitor takes a two minute averaged sample of particle concentrations in 5 size fractions (PM 1, PM 2.5, PM 7, PM 10 and total suspended particles (TSP)). Results of particulate monitoring, presented in Table 2, revealed that PM 2.5 and PM 10 particle concentrations were well below the ASHRAE target concentrations in all areas monitored.

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**Table 2: Particle, Temperature, Relative Humidity, Carbon Dioxide and Carbon Monoxide  
Measurements Collected on September 9, 2015 at Glenwood Middle School**

Location	Time	PM1 ( $\mu\text{g}/\text{m}^3$ )	PM2.5 ( $\mu\text{g}/\text{m}^3$ )	PM7 ( $\mu\text{g}/\text{m}^3$ )	PM10 ( $\mu\text{g}/\text{m}^3$ )	TSP ( $\mu\text{g}/\text{m}^3$ )	Temp (°F)	Rh (%)	CO (ppm)	CO <sub>2</sub> (ppm)
CR 3	3:10 PM	0	1	2	2	2	76.4	53.5	0.2	505
CR 11	3:13 PM	0	1	2	2	5	75.5	53.9	0.5	450
CR 15	3:26 PM	0	1	2	2	5	75.8	50.7	0.3	509
CR 12	3:20 PM	0	1	1	1	2	76.0	50.1	0.3	418
CR 20	3:28 PM	0	1	2	2	3	75.9	49.5	0.3	462
CR 29	3:46 PM	0	0	1	1	2	74.7	49.1	0.3	402
CR 30	3:49 PM	0	0	1	1	2	75.5	48.5	0.3	438
CR 34	3:36 PM	0	0	1	1	9	74.7	50.3	0.3	490
CR 37	3:42 PM	0	0	4	4	5	74.9	51.6	0.3	372
PCR 70	4:18 PM	0	0	0	0	1	78.4	44.6	0.4	485
PCR 71	4:12 PM	0	0	1	1	1	74.8	49.9	0.5	808
PCR 60	4:28 PM	0	0	1	1	2	76	57.1	0.3	422
PCR 61	4:22 PM	0	1	3	4	5	76.9	48.1	0.3	573
PCR 80	4:50 PM	0	0	1	2	4	<b>81.6</b>	<b>70.6</b>	0.3	548
PCR 81	4:38 PM	0	0	3	4	9	74.0	51.0	0.4	741
Out 2 CY	4:54 PM	0	1	5	7	9	89.9	41.1	0	336
Out 1	5:01 PM	0	1	4	7	10	94.1	39.6	0	334

CR = Classroom; PCR = Portable Classroom; Bold type indicates measurements above the guidelines

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**B. Air Monitoring for Fungal Identification and Counting on September 9, 2015**

In the absence of visual sources of mold amplification and growth in the classrooms, non-viable spore trap samples were collected from eight classrooms within the main school building (Classrooms 3, 11, 12, 15, 20, 29, 30, 34, and Music Classroom 37), six portable classrooms (portable classrooms 60, 61, 70, 71, 80, and 81) and two outdoor locations to determine whether there was a difference between mold spore loads inside the building versus outside.

The spore trap samples were collected using AllergenCo-D cassettes attached to a Buck BioAire™ sampling pump calibrated to 15 liter per minute (LPM) air flow. The samples were collected for a period of ten minutes, the time period recommended for spore trap sampling in a clean indoor environment. The spore trap samples were submitted to Aerobiology Laboratory for analysis. The sample results are reported as the spores per cubic meter of air (spores per m<sup>3</sup>) of hyphal fragments and total fungal spores. Depending upon the morphology of the spores, they were counted by their unique genus or were grouped into spores exhibiting common characteristics (e.g., *Penicillium*/*Aspergillus* group). Table 3 presents the results of the spore trap samples collected at Glenwood Middle School on September 9, 2015.

Indoor spore counts ranged from 1,133 to 3,173 total spores per cubic meter of air (m<sup>3</sup>) in the main school building and from 1,053 to 2,373 in the portable classrooms on September 9, 2015. All indoor samples had total spore counts lower than the outdoor samples which ranged from 21,890 to 31,876 spores per m<sup>3</sup>. Unknown spores were found in the Classroom 3 and 70 samples respectively at 7 spores per m<sup>3</sup> each, but these spores were not found in the outdoor samples. *Pithomyces* spores were higher in the Classroom 60 sample (167 spores per m<sup>3</sup>) compared to the outdoor samples (113 - 120 spores per m<sup>3</sup>). Windows were not open during sampling.

No secondary colonizers including *Chaetomium* or *Stachybotrys* were detected in the indoor air samples. Hyphal elements were detected in seven of the nine main building classrooms and in five of the six portable classrooms. Indoor samples ranged from 7 to 60 hyphal elements per m<sup>3</sup>; however, all detected indoor hyphal elements were lower than the outdoor sample hyphal element counts ranging from 47 to 67 elements per m<sup>3</sup> in the two outdoor samples. Variations in outdoor spore concentrations are a function of diurnal rhythms of spore release, weather-related factors (e.g., wind, rain, snow cover, temperature), and physical spatial factors. Certificates of analysis are included as Attachment B.

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**Table 3: Results of Spore Trap Sampling in Selected Classrooms in Glenwood Middle School on September 9, 2015**

Location	Outside near Room 80 (Out 1)	Outside in Courtyard (Out 2)	Room 3 (GM 03)	Room 11 (GM 11)	Room 12 (GM 12)	Room 15 (GM 15)	Room 20 (GM 20)	Room 29 (GM 29)	Room 30 (GM 30)	Room 34 (GM 34)	Music Room 37 (GM 37)
Spore Type	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>
<b>Alternaria</b>	27	47	-	-	-	-	-	-	-	7	7
<b>Ascospores</b>	127	307	20	-	13	47	40	40	13	7	13
<b>Basidiospores</b>	16,787	25,739	1,173	1,813	2,133	1,813	2,507	2,187	1,173	747	1,760
<b>Botrytis</b>	-	13	-	-	-	-	-	-	-	-	-
<b>Cercospora</b>	47	20	-	-	-	13	-	-	-	-	7
<b>Cladosporium</b>	4,636	3,837	260	240	147	320	327	160	133	127	153
<b>Curvularia</b>	33	53	-	-	-	-	-	-	-	7	-
<b>Drechslera/Bipolaris group</b>	-	7	-	-	-	-	-	-	-	-	-
<b>Epicoccum</b>	27	47	-	-	-	-	-	-	-	7	-
<b>Hyphal Elements</b>	47	67	13	33	7	7	-	27	-	20	27
<b>Oidium</b>	-	7	-	-	-	-	-	-	-	-	-
<b>Penicillium/Aspergillus</b>	-	1,487	73	120	147	167	300	160	53	173	107
<b>Pithomyces</b>	120	113	20	67	7	7	-	-	-	13	7
<b>Polythrincium</b>	7	-	-	-	-	-	-	-	-	-	-
<b>Pyricularia</b>	7	7	-	-	-	7	-	-	-	-	-
<b>Smuts, Periconia, myxomycetes</b>	27	120	-	-	-	13	-	7	7	27	-
<b>Torula</b>	-	7	-	-	-	-	-	-	-	-	-
<b>Unknown</b>	-	-	<b>7</b>	-	-	-	-	-	-	-	-
<b>Total Fungi</b>	21,890	31,876	1,567	2,273	2,453	2,393	3,173	2,580	1,380	1,133	2,080

Bold numbers represent spore concentrations above the outdoor counts. Dashes designate none detected.



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**Table 4: Results of Spore Trap Sampling in Portable Classrooms in Glenwood Middle School on September 9, 2015**

Location	Outside near Room 80 (Out 1)	Outside in Courtyard (Out 2)	Room 60 (GM 60)	Room 61 (GM 61)	Room 70 (GM 70)	Room 71 (GM 71)	Room 80 (GM 80)	Room 81 (GM 81)
Spore Type	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>	Spores/ m <sup>3</sup>
<i>Alternaria</i>	27	47	20	-	-	13	7	7
Ascospores	127	307	7	13	7	13	7	-
Basidiospores	16,787	25,739	1,173	747	1,813	667	587	1,360
<i>Botrytis</i>	-	13	-	-	-	-	-	-
<i>Cercospora</i>	47	20	13	-	-	-	-	-
<i>Cladosporium</i>	4,636	3,837	547	280	207	153	280	253
<i>Curvularia</i>	33	53	-	-	-	7	13	-
<i>Drechslera/Bipolaris</i> group	-	7	-	-	-	-	-	-
<i>Epicoccum</i>	27	47	-	-	-	-	7	-
Hyphal Elements	47	67	60	13	-	40	53	13
<i>Oidium</i>	-	7	-	-	-	-	-	-
<i>Penicillium/Aspergillus</i>	-	1,487	373	120	33	207	67	267
<i>Pithomyces</i>	120	113	<b>167</b>	20	13	40	33	-
<i>Polythrincium</i>	7	-	-	-	-	-	-	-
<i>Pyricularia</i>	7	7	-	-	7	-	-	-
<i>Smuts, Periconia, myxomycetes</i>	27	120	13	-	13	7	-	-
<i>Torula</i>	-	7	-	-	-	-	-	-
Unknown	-	-	-	-	<b>7</b>	-	-	-
<b>Total Fungi</b>	21,890	31,876	2,373	1,193	2,100	1,147	1,053	1,900

Bold numbers represent spore concentrations above the outdoor counts. Dashes designate none detected.

**Spore Sampling Report  
For Glenwood Middle School  
September 9, 2015**

**III. CONCLUSIONS AND RECOMMENDATIONS**

Aria Environmental, Inc. (AE) was contracted by Howard County Public School System to perform spore trap sampling at the Glenwood Middle School at the end of August 2015 due to air quality concerns expressed by staff and parents and to monitor the school after a recent heating, ventilation and air-conditioning (HVAC) system upgrade. AE made measurements for temperature, humidity, carbon monoxide, carbon dioxide and particulate matter and collected microbial spore trap samples on September 9, 2015.

Thermal comfort parameters of temperature and humidity were measured and found to be within the comfort ranges established by ASHRAE except for one portable classroom that is being used as storage and does not have conditioned air. Carbon dioxide, carbon monoxide and particulate matter measurements were within acceptable ranges for good indoor air quality in all areas.

Indoor spore counts ranged from 1,133 to 3,173 total spores per cubic meter of air (m<sup>3</sup>) in the main school building classrooms and from 1,053 to 2,373 in the portable classrooms on September 9, 2015. All indoor samples had total spore counts lower than the outdoor samples which ranged from 21,890 to 31,876 spores per m<sup>3</sup>.

Unknown spores were found in the Classroom 3 and 70 samples respectively at 7 spores per m<sup>3</sup> each, but these spores were not found in the outdoor samples. Pithomyces spores were higher in the Classroom 60 sample (167 spores per m<sup>3</sup>) compared to the outdoor samples (113 - 120 spores per m<sup>3</sup>). According to a recent literature review, these spore types have little human health implication.

Table 5 presents a summary of spore sampling results to date in the 2015 - 2016 school year. The indoor and outdoor ranges demonstrate the variable nature of spore counts.

**Table 5 – Summary of Spore Sampling Results to Date at GMS in the 2015-2016 School Year**

<b>Date</b>	<b>Indoor Spore Count Range Spores per m<sup>3</sup></b>	<b>Outdoor Spore Count Range Spores per m<sup>3</sup></b>
August 25, 2015	1,787 to 8,807	34,001 to 37,316
August 27, 2015	400 to 747	9,433 to 10,960
September 2, 2015	1,860 to 7,960	33,294 to 37,306
September 9, 2015	1,053 to 3,173	21,890 to 31,876

Spore measurements collected in classrooms were generally acceptable compared to outdoor samples with outdoor total spore counts approximately 14 times higher than the indoor counts on average. Indoor sample total spore counts and individual spore counts were all lower than the outdoor sample counts with a few exceptions described above. Follow up air sampling is scheduled for September 16, 2015 and will be performed on a weekly basis until the end of September in order to monitor changes in conditions affected by seasonal variations and the new HVAC system.

**IV. LIMITATIONS**

This report has been prepared for the exclusive use of the Howard County Public School System and/or their agents. This service has been performed in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site

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observations. We have not verified the completeness or accuracy of the information provided to us by others, unless otherwise noted. Our observations and recommendations are based upon conditions readily visible at the site at the time of our site visit, and upon current industry standards. Destructive sampling was not performed as part of this survey. No observations were made behind solid walls, ceilings or in pipe chases that weren't already openly visible.

By virtue of providing the services described in this report, the preparer does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies any conditions at the site that may present a potential danger to public health, safety, or the environment. It is the Client's responsibility to notify the appropriate local, state, or federal public agencies as required by law, or otherwise to disclose, in a timely manner, any information that may be necessary to prevent any danger to public health, safety, or the environment. Under this scope of services, the preparer assumes no responsibility regarding response actions (e.g. abatement, removal, etc.) initiated as a result of these findings. Response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements, and should be performed by appropriately licensed personnel as warranted.

**Attachment A:**

**Building Layout and Sample Location Plan for September 9, 2015**

Rooms 39 & 40

High-lighted rooms designate areas sampled on September 9, 2015



Glenwood Middle School Floor Plan

As of 8/02/13



**Attachment B:**

**Report of Analysis and Chain of Custody Forms  
September 9, 2015**

Aria Environmental  
P.O. Box 286  
Woodbine, Maryland 21797  
Attn: Julie Barth  
Project: **J15-876 GMS / Glenwood MS**  
Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 09/09/2015  
Date Received: 09/10/2015  
Date Analyzed: 09/15/2015  
Date Reported: 09/15/2015  
Project ID: 15021976  
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1054 Spore Trap Analysis: SOP 3.8

Client Sample Number	<b>GM-03</b>				<b>GM-Out1</b>			
Sample Location	<b>Classroom 3</b>				<b>Outside Near CR 80</b>			
Sample Volume (L)	<b>150</b>				<b>150</b>			
Lab Sample Number	<b>15021976-001</b>				<b>15021976-016</b>			
<b>Spore Identification</b>	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	4	27	<1	-
ascospores	3	20	1	1/6	19	127	1	-
basidiospores	44	1173	75	1/14	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	7	47	<1	-
Cladosporium	39	260	17	1/18	29	4636	21	-
Curvularia	-	-	-	-	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	4	27	<1	-
hyphal elements	2	13	1	1/4	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	11	73	5	-	-	-	-	-
Pithomyces	3	20	1	1/6	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	1	7	<1	-	-	-	-	-
	Debris Rating <b>3</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	103	1567	~100%	1/14	204	21890	~100%	-

Aria Environmental  
P.O. Box 286  
Woodbine, Maryland 21797  
Attn: Julie Barth  
Project: **J15-876 GMS / Glenwood MS**  
Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 09/09/2015  
Date Received: 09/10/2015  
Date Analyzed: 09/15/2015  
Date Reported: 09/15/2015  
Project ID: 15021976

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Client Sample Number	GM-11				GM-Out1			
Sample Location	Classroom 11				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-002				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	4	27	<1	-
ascospores	-	-	-	-	19	127	1	-
basidiospores	34	1813	80	1/9	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	7	47	<1	-
Cladosporium	36	240	11	1/19	29	4636	21	-
Curvularia	-	-	-	-	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	4	27	<1	-
hyphal elements	5	33	1	1/1	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	18	120	5	-	-	-	-	-
Pithomyces	10	67	3	1/2	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-
	Debris Rating <b>3</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	103	2273	~100%	1/10	204	21890	~100%	-



Aria Environmental  
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Project ID: 15021976

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Client Sample Number	GM-12				GM-Out1			
Sample Location	Classroom 12				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-003				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	4	27	<1	-
ascospores	2	13	1	1/10	19	127	1	-
basidiospores	40	2133	87	1/8	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	7	47	<1	-
Cladosporium	22	147	6	1/32	29	4636	21	-
Curvularia	-	-	-	-	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	4	27	<1	-
hyphal elements	1	7	<1	1/7	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	22	147	6	-	-	-	-	-
Pithomyces	1	7	<1	1/18	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-
	Debris Rating <b>3</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	88	2453	~100%	1/9	204	21890	~100%	-

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Client Sample Number	GM-15				GM-Out1			
Sample Location	Classroom 15				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-004				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	4	27	<1	-
ascospores	7	47	2	1/3	19	127	1	-
basidiospores	34	1813	76	1/9	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	2	13	1	1/4	7	47	<1	-
Cladosporium	48	320	13	1/14	29	4636	21	-
Curvularia	-	-	-	-	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	4	27	<1	-
hyphal elements	1	7	<1	1/7	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	25	167	7	-	-	-	-	-
Pithomyces	1	7	<1	1/18	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	1	7	<1	1/1	1	7	<1	-
Smuts,Periconia,Myxomycetes	2	13	1	1/2	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-
	Debris Rating <b>3</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	121	2393	~100%	1/9	204	21890	~100%	-

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Client Sample Number	GM-20				GM-Out1			
Sample Location	Classroom 20				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-005				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	4	27	<1	-
ascospores	6	40	1	1/3	19	127	1	-
basidiospores	47	2507	79	1/7	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	7	47	<1	-
Cladosporium	49	327	10	1/14	29	4636	21	-
Curvularia	-	-	-	-	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	4	27	<1	-
hyphal elements	-	-	-	-	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	45	300	9	-	-	-	-	-
Pithomyces	-	-	-	-	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-
	Debris Rating <b>2</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	147	3173	~100%	1/7	204	21890	~100%	-

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Client Sample Number	GM-29				GM-Out1			
Sample Location	Classroom 29				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-006				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	4	27	<1	-
ascospores	6	40	2	1/3	19	127	1	-
basidiospores	41	2187	85	1/8	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	7	47	<1	-
Cladosporium	24	160	6	1/29	29	4636	21	-
Curvularia	-	-	-	-	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	4	27	<1	-
hyphal elements	4	27	1	1/2	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	24	160	6	-	-	-	-	-
Pithomyces	-	-	-	-	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	1	7	<1	1/4	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-
	Debris Rating <b>3</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	100	2580	~100%	1/8	204	21890	~100%	-

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Client Sample Number	GM-30				GM-Out1			
Sample Location	Classroom 30				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-007				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	4	27	<1	-
ascospores	2	13	1	1/10	19	127	1	-
basidiospores	44	1173	85	1/14	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	7	47	<1	-
Cladosporium	20	133	10	1/35	29	4636	21	-
Curvularia	-	-	-	-	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	4	27	<1	-
hyphal elements	-	-	-	-	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	8	53	4	-	-	-	-	-
Pithomyces	-	-	-	-	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	1	7	<1	1/4	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-
	Debris Rating <b>3</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	75	1380	~100%	1/16	204	21890	~100%	-

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Client Sample Number	GM-34				GM-Out1			
Sample Location	Classroom 34				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-008				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	1	7	1	1/4	4	27	<1	-
ascospores	1	7	1	1/19	19	127	1	-
basidiospores	28	747	66	1/22	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	7	47	<1	-
Cladosporium	19	127	11	1/37	29	4636	21	-
Curvularia	1	7	1	1/5	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	1	7	1	1/4	4	27	<1	-
hyphal elements	3	20	2	1/2	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	26	173	15	-	-	-	-	-
Pithomyces	2	13	1	1/9	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	4	27	2	1/1	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-
	Debris Rating <b>3</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	86	1133	~100%	1/19	204	21890	~100%	-

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Client Sample Number	GM-37				GM-Out1			
Sample Location	Classroom 37				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-009				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	1	7	<1	1/4	4	27	<1	-
ascospores	2	13	1	1/10	19	127	1	-
basidiospores	33	1760	85	1/10	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	1	7	<1	1/7	7	47	<1	-
Cladosporium	23	153	7	1/30	29	4636	21	-
Curvularia	-	-	-	-	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	4	27	<1	-
hyphal elements	4	27	1	1/2	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	16	107	5	-	-	-	-	-
Pithomyces	1	7	<1	1/18	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-
	Debris Rating <b>3</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	81	2080	~100%	1/11	204	21890	~100%	-

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Client Sample Number	GM-71				GM-Out1			
Sample Location	Classroom 71				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-010				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	2	13	1	1/2	4	27	<1	-
ascospores	2	13	1	1/10	19	127	1	-
basidiospores	25	667	58	1/25	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	7	47	<1	-
Cladosporium	23	153	13	1/30	29	4636	21	-
Curvularia	1	7	1	1/5	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	4	27	<1	-
hyphal elements	6	40	3	1/1	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	31	207	18	-	-	-	-	-
Pithomyces	6	40	3	1/3	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	1	7	1	1/4	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-
	Debris Rating <b>3</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	97	1147	~100%	1/19	204	21890	~100%	-



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Client Sample Number	GM-70				GM-Out1			
Sample Location	Classroom 70				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-011				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	4	27	<1	-
ascospores	1	7	<1	1/19	19	127	1	-
basidiospores	34	1813	86	1/9	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	7	47	<1	-
Cladosporium	31	207	10	1/22	29	4636	21	-
Curvularia	-	-	-	-	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	4	27	<1	-
hyphal elements	-	-	-	-	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	5	33	2	-	-	-	-	-
Pithomyces	2	13	1	1/9	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	1	7	<1	1/1	1	7	<1	-
Smuts,Periconia,Myxomycetes	2	13	1	1/2	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	1	7	<1	-	-	-	-	-
	Debris Rating <b>2</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	77	2100	~100%	1/10	204	21890	~100%	-

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Client Sample Number	GM-61				GM-Out1			
Sample Location	Classroom 61				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-012				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	4	27	<1	-
ascospores	2	13	1	1/10	19	127	1	-
basidiospores	14	747	63	1/22	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	7	47	<1	-
Cladosporium	42	280	23	1/17	29	4636	21	-
Curvularia	-	-	-	-	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	4	27	<1	-
hyphal elements	2	13	1	1/4	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	18	120	10	-	-	-	-	-
Pithomyces	3	20	2	1/6	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-
	Debris Rating <b>2</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	81	1193	~100%	1/18	204	21890	~100%	-

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Client Sample Number	GM-60				GM-Out1			
Sample Location	Classroom 60				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-013				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	3	20	1	1/1	4	27	<1	-
ascospores	1	7	<1	1/19	19	127	1	-
basidiospores	22	1173	49	1/14	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	2	13	1	1/4	7	47	<1	-
Cladosporium	82	547	23	1/8	29	4636	21	-
Curvularia	-	-	-	-	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	4	27	<1	-
hyphal elements	9	60	3	1/1	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	56	373	16	-	-	-	-	-
Pithomyces	25	167	7	1/1	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	2	13	1	1/2	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-
	Debris Rating <b>3</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	202	2373	~100%	1/9	204	21890	~100%	-

Aria Environmental  
P.O. Box 286  
Woodbine, Maryland 21797  
Attn: Julie Barth  
Project: **J15-876 GMS / Glenwood MS**  
Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 09/09/2015  
Date Received: 09/10/2015  
Date Analyzed: 09/15/2015  
Date Reported: 09/15/2015  
Project ID: 15021976  
Page 14 of 17

Client Sample Number	GM-81				GM-Out1			
Sample Location	Classroom 81				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-014				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	1	7	1	1/4	4	27	<1	-
ascospores	1	7	1	1/19	19	127	1	-
basidiospores	22	587	56	1/29	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	7	47	<1	-
Cladosporium	42	280	27	1/17	29	4636	21	-
Curvularia	2	13	1	1/3	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	1	7	1	1/4	4	27	<1	-
hyphal elements	8	53	5	1/1	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	10	67	6	-	-	-	-	-
Pithomyces	5	33	3	1/4	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-
	Debris Rating <b>3</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	92	1053	~100%	1/21	204	21890	~100%	-

Aria Environmental  
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Project: **J15-876 GMS / Glenwood MS**  
Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 09/09/2015  
Date Received: 09/10/2015  
Date Analyzed: 09/15/2015  
Date Reported: 09/15/2015  
Project ID: 15021976  
Page 15 of 17

Client Sample Number	GM-80				GM-Out1			
Sample Location	Classroom 80				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-015				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	1	7	<1	1/4	4	27	<1	-
ascospores	-	-	-	-	19	127	1	-
basidiospores	51	1360	72	1/12	105	16787	77	-
Botrytis	-	-	-	-	-	-	-	-
Cercospora	-	-	-	-	7	47	<1	-
Cladosporium	38	253	13	1/18	29	4636	21	-
Curvularia	-	-	-	-	5	33	<1	-
Drechslera/Bipolaris group	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	4	27	<1	-
hyphal elements	2	13	1	1/4	7	47	<1	-
Oidium	-	-	-	-	-	-	-	-
Penicillium/Aspergillus group	40	267	14	-	-	-	-	-
Pithomyces	-	-	-	-	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	-	-	-	-	1	7	<1	-
Smuts,Periconia,Myxomycetes	-	-	-	-	4	27	<1	-
Torula	-	-	-	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-
	Debris Rating <b>3</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	132	1900	~100%	1/12	204	21890	~100%	-

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 P.O. Box 286  
 Woodbine, Maryland 21797  
 Attn: Julie Barth  
 Project: **J15-876 GMS / Glenwood MS**  
 Condition of Sample(s) Upon Receipt: Acceptable

 Date Collected: 09/09/2015  
 Date Received: 09/10/2015  
 Date Analyzed: 09/15/2015  
 Date Reported: 09/15/2015  
 Project ID: 15021976  
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Client Sample Number	GM-Out2				GM-Out1			
Sample Location	Outside in Courtyard near CR 5				Outside Near CR 80			
Sample Volume (L)	150				150			
Lab Sample Number	15021976-017				15021976-016			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	7	47	<1	2/1	4	27	<1	-
ascospores	46	307	1	2/1	19	127	1	-
basidiospores	161	25739	81	2/1	105	16787	77	-
Botrytis	2	13	<1	-	-	-	-	-
Cercospora	3	20	<1	1/2	7	47	<1	-
Cladosporium	24	3837	12	1/1	29	4636	21	-
Curvularia	8	53	<1	2/1	5	33	<1	-
Drechslera/Bipolaris group	1	7	<1	-	-	-	-	-
Epicoccum	7	47	<1	2/1	4	27	<1	-
hyphal elements	10	67	<1	1/1	7	47	<1	-
Oidium	1	7	<1	-	-	-	-	-
Penicillium/Aspergillus group	223	1487	5	-	-	-	-	-
Pithomyces	17	113	<1	1/1	18	120	1	-
Polythrincium	-	-	-	-	1	7	<1	-
Pyricularia	1	7	<1	1/1	1	7	<1	-
Smuts,Periconia,Myxomycetes	18	120	<1	5/1	4	27	<1	-
Torula	1	7	<1	-	-	-	-	-
Unknown	-	-	-	-	-	-	-	-
	Debris Rating <b>3</b>				Debris Rating <b>3</b>			
Analytical Sensitivity	Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>				Analytical Sensitivity: <b>7 spr/m<sup>3</sup></b>			
Comments								
Total *See Footnotes	530	31876	~100%	1/1	204	21890	~100%	-

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Date Collected: 09/09/2015  
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Date Analyzed: 09/15/2015  
Date Reported: 09/15/2015  
Project ID: 15021976  
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## Footnotes and Additional Report Information

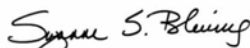
### Debris Rating Table

1	Minimal (<5%) particulate present	Reported values are minimally affected by particulate load.
2	5% to 25% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
3	26% to 75% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
4	75% to 90% of the trace occluded with particulate	Negative bias is expected. The degree of bias increases directly with the percent of the trace that is occluded.
5	Greater than 90% of the trace occluded with particulate	Quantification not possible due to large negative bias. A new sample should be collected at a shorter time interval or other measures taken to reduce particulate load.

1. Penicillium/Aspergillus group spores are characterized by their small size, round to ovoid shape, being unicellular, and usually colorless to lightly pigmented. There are numerous genera of fungi whose spore morphology is similar to that of the Penicillium/Aspergillus type. Two common examples would be Paecilomyces and Acremonium. Although the majority of spores placed in this group are Penicillium, Aspergillus, or a combination of both. Keep in mind that these are not the only two possibilities.
2. Ascospores are sexually produced fungal spores formed within an ascus. An ascus is a sac-like structure designed to discharge the ascospores into the environment, e.g. Ascobolus.
3. Basidiospores are typically blown indoors from outdoors and rarely have an indoor source. However, in certain situations a high basidiospore count indoors may be indicative of a wood decay problem or wet soil.
4. The Smut, Periconia, Myxomycete group is composed of three different groups whose spores have similar morphologies. Smuts are plant pathogens, Periconia is a relatively uncommon mold indoors, and Myxomycetes are not fungi but slime molds. Although these organisms do not typically proliferate indoors, their spores are potentially allergenic.
5. The colorless group contains colorless spores which were unidentifiable to a specific genus. Examples of this group include Acremonium, Aphanocladium, Beauveria, Chrysosporium, Engyodontium microconidia, yeast, some arthrospores, as well as many others.
6. Hyphae are the vegetative mode of fungi. Hyphal elements are fragments of individual Hyphae. They can break apart and become airborne much like spores and are potentially allergenic. A mass of hyphal elements is termed the mycelium. Hyphae in high concentration may be indicative of colonization.
7. Dash (-) in this report, under raw count column means 'not detected (ND)'; otherwise 'not applicable' (NA).
8. The positive-hole correction factor is a statistical tool which calculates a probable count from the raw count, taking into consideration that multiple particles can impact on the same hole; for this reason the sum of the calculated counts may be less than the positive hole corrected total.
9. Due to rounding totals may not equal 100%.
10. Minimum Reporting Limits (MRL) for BULKs, DUSTS, SWABS, and WATER samples are a calculation based on the sample size and the dilution plate on which the organism was counted. Results are a compilation of counts taken from multiple dilutions and multiple medias. This means that every genus of fungi or bacteria recovered can be counted on the plate on which it is best represented.
11. If the final quantitative result is corrected for contamination based on the blank, the blank correction is stated in the sample comments section of the report.
12. Analysis conducted on non-viable spore traps is completed using Indoor Environmental Standards Organization (IESO) Standard 2210.
13. The results in this report are related to this project and these samples only.
14. For samples with an air volume of < 100L, the number of significant figures in the result should be considered (2) two. For samples with air volumes between 100-999L, the number of significant figures in the result should be considered (3) three. For example, a sample with a result of 55,443 spr/m<sup>3</sup> from a 75L sample using significant figures should be considered 55,000. The same result of 55,443 from a 150L sample using significant figures should be considered 55,400 spr/m<sup>3</sup>.
15. If the In/Out ratio is greater than 100 times it is indicated >100/1, rather than showing the real value.

#### Terminology Used in Direct Exam Reporting

**Conidiophores are a type of modified hyphae from which spores are born. When seen on a surface sample in moderate to numerous concentrations they may be indicative of fungal growth.**



Suzanne S. Blevins, B.S., SM (ASCP)  
Laboratory Director

15 021976  
**15021976**



LAB #192683 (CO)  
 LAB #102977 (GA)  
 LAB #163063 (VA)  
 LAB #210229 (AZ)

NVLAP Lab Code 200860-0 (CO)  
 NVLAP Lab Code 200829-0 (VA)  
 NVLAP Lab Code 500097-0 (AZ)

AZ, CO, GA, VA, NJ

<b>Aerobiology Client</b> Aria Environmental, Inc.		<b>Collected By/Date:</b> 09/09/15		<b>Relinquished By/Date:</b> 9/15/15 UPS	
<b>Field Contact</b> Julie Barth	<b>Reporting Address</b> PO Box 286, Woodbine, MD 21797	<b>Relinquished By/Date:</b>		<b>Received By/Date:</b> 9/10/15	
<b>Billing Address</b> SAME	<b>Phone/Fax</b> 410-549-5774/410-549-4488	<b>Sampler Type</b> Andersen SAS	<b>Sample Aire</b> AeroTrap	<b>Other</b> <u>Alargacool</u>	
<b>Reporting Email (s)</b> jbarth@ariaenviro.com	<b>Project Name:</b> Glenwood MS	<b>PO#/Job#:</b> J15-876 GMS		<b>Notes:</b>	
<b>Routine</b> <input checked="" type="radio"/> 24 Hour <input type="radio"/> Same Day <input type="radio"/> 4 Hou <input type="radio"/> 2 Hou <input type="radio"/>	<b>SAMPLING LOCATION ZIP CODE</b> 21738	<b>5 Day (Asbestos Only)</b>		<b>CC Info:</b>	

Sample No.	Test Code	Sample Location	Total Volume/Area
1	GM-03	Classroom 3	150 L
2	GM-11	Classroom 11	150 L
3	GM-12	Classroom 12	150 L
4	GM-15	Classroom 15	150 L
5	GM-20	Classroom 20	150 L
6	GM-29	Classroom 29	150 L
7	GM-30	Classroom 30	150 L
8	GM-34	Classroom 34	150 L
9	GM-37	Classroom 37	150 L
10	GM-71	Classroom 71	150 L
11	GM-70	Classroom 70	150 L
12	GM-61	Classroom 61	150 L
13	GM-60	Classroom 60	150 L
14	GM-81	Classroom 81	150 L

1054	Direct, Non-viable Spore Trap	1015	Culture - WATER Legionella
1051	Direct, Qualitative- Swab/Tape	1017	Culture - SWAB Legionella
1050	Direct, Qualitative- Bulk	1010	WATER - Potable - E. coli/total coliforms
1005	AIR Culture - Bacterial Count w/ ID's	1012	SWAB - E. coli/total coliforms
1030	AIR Culture - Fungal Count w/ ID's	1028	Sewage Screen (E. coli/Enterococcus/fecal coliforms)
1006	SWAB Culture - Bacterial Count w/ ID's	2056	Heterotrophic Plate Count
1031	SWAB Culture - Fungal Count w/ ID's	3001	ASBESTOS - Point count
1008	BULK Culture - Bacterial Count w/ ID's	3002	ASBESTOS - PLM Analysis
1033	BULK Culture - Fungal Count w/ ID's	3003	ASBESTOS - Particle characterization
1007	WATER Culture - Bacterial Count w/ID's	3004	ASBESTOS - PCM Analysis

7184 North Park Drive, Pennsauken, NJ 08109 - (856) 486-1177 Fax (856) 486-0005 - email: info@pureearthlab.com  
 2400 Herodian Way, Suite 190, Smyrna, GA 30080 - (866) 620-9313 Fax (770) 947-2938 - email: ATL@aerobiology.net  
 780 Simms Street, Suite 104, Golden, CO 80401 - (866) 620-9348 Fax (303) 232-0283 - email: denver@aerobiology.net  
 43760 Trade Center Place, Suite 100, Dulles, VA 20166 - (877) 648-9150 Fax (877) 598-0946 - email: info@aerobiology.net  
 15061 Springdale Street, Suite 111, Huntington Beach, CA 92649 - (714) 895-8401 - (866) 895-8132 - email: social@aerobiology.net  
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Lab Use:  
15021976



NVLAP Lab Code 200860-D (CO)  
 NVLAP Lab Code 200829-D (VA)  
 NVLAP Lab Code 500097-D (AZ)

LAB #192683 (CO)  
 LAB #102977 (GA)  
 LAB #163063 (VA)  
 LAB #210229 (AZ)

<b>Aerobiology Client</b> Aria Environmental, Inc.		<b>Collected By/Date:</b> 09/09/15		<b>Relinquished By/Date:</b> <span style="color: blue;">5/9/15 UPS JB</span>	
<b>Field Contact</b> Julie Barth	<b>Reporting Address</b> PO Box 286, Woodbine, MD 21797		<b>Relinquished By/Date:</b>		<b>Received By/Date:</b> <span style="color: red;">PJ 9/10/15</span>
<b>Billing Address</b> SAME	<b>Sampler Type</b> Andersen SAS	<b>Sample Aire</b> Aero Trap	<b>Other Allergens</b>		
<b>Phone/Fax</b> 410-549-5774/410-549-4488	<b>PO#/Job#:</b> J15-876 GMS				
<b>Reporting Email (s)</b> jbarth@ariaenviro.com	<b>Project Name:</b> Glenwood MS				
<b>Routine</b> <input checked="" type="radio"/> 24 Hour <input type="radio"/> Same Day <input type="radio"/> 4 Hour <input type="radio"/> 2 Hour <input type="radio"/>	<b>5 Day (Asbestos Only)</b>		<b>Notes:</b>		
<b>SAMPLING LOCATION ZIP CODE</b> 21738		<b>CC Info:</b>			

Sample No.	Test Code	Sample Location	Total Volume/Area
1 GM-80	1054	Classroom 80	150 L
2 GM-Out1	1054	Outside near CR 80	150 L
3 GM-Out2	1054	Outside in Courtyard near CR 5	150 L
4			
5			
6			
7			
8			
9			
10			
11			
12			
13			
14			

1054	Direct, Non-viable Spore Trap	1015	Culture - WATER Legionella
1051	Direct, Qualitative- Swab/Tape	1017	Culture - SWAB Legionella
1050	Direct, Qualitative- Bulk	1010	WATER - Potable - E. coli/total coliforms
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1031	SWAB Culture - Fungal Count w/ ID's	3001	ASBESTOS - Point count
1008	BULK Culture - Bacterial Count w/ ID's	3002	ASBESTOS - PLM Analysis
1033	BULK Culture - Fungal Count w/ ID's	3003	ASBESTOS - Particle characterization
1007	WATER Culture - Bacterial Count w/ID's	3004	ASBESTOS - PCM Analysis