# 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**

**JANUARY 7, 2016**

**150876**

**SPORE TRAP SAMPLING REPORT**
**FOR GLENWOOD MIDDLE SCHOOL**
**DECEMBER 21, 2015**

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**SPORE TRAP SAMPLING REPORT**
**FOR GLENWOOD MIDDLE SCHOOL**
**DECEMBER 21, 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 heating, ventilation and air-conditioning (HVAC) system upgrade performed in summer, 2015. 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 December 21, 2015 as part of a series of spore sampling events that will occur regularly during the 2015 - 2016 school year. This report presents the results of air sampling made on December 21, 2015.

**Spore Trap Sampling Report**
**For Glenwood Middle School**
**December 21, 2015**

## I. BACKGROUND

Representatives from Aria Environmental, Inc. (AE) visited Glenwood Middle School on December 21, 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 4, 10, 13, 14, 21, 22, 31, 32 and portable classrooms 60 and 61. Outdoor air samples were also collected for comparison purposes in one courtyard and outside near portable classroom 60. 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. Monitoring was performed after school with no students in the rooms. Weather on the day of monitoring was cool with a light breeze.

## II. OBSERVATIONS AND MEASUREMENTS

### A. Observations and Measurements on December 21, 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 U.S. Environmental Protection Agency (EPA) recommends maintaining indoor relative humidity below 60% and ideally between 30 and 50%. The room air temperature measured between 4:19 PM and 5:15 PM ranged from 66.7 to 71.6° F with an average of 70° F. The indoor relative humidity ranged from 27.7 to 37.2 percent. The temperature measurements are considered acceptable for winter thermal comfort in all rooms except Portable Classroom 61 where the temperature was slightly lower than the comfort range. Relative humidity measurements were mostly slightly below the comfort ranges. Lower humidity is expected during the heating season in buildings that do not add humidity. The comfort ranges are only set for the Summer and Winter seasons when temperatures are usually consistent. There are no Fall or Spring ranges because these seasons can include both heating and cooling modes of HVAC operation. The outside temperature at 5:18 PM was 59.0° F and the outdoor relative humidity was 49.1% outside near Portable Classroom 60, and the outside temperature at 5:25 PM was 56.6° F and the relative humidity was 58.8% in the courtyard outside Classroom 20. No windows or doors were observed to be open during the monitoring period. 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[a]**

| Relative Humidity | Winter Temperature | Summer Temperature |
|---|---|---|
| 30% | 68.5°F – 76.0°F | 74.0°F – 80.0°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 |

[a]adapted from ASHRAE Standard 55-2013

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

monitoring was performed after school with the rooms unoccupied during sampling. Carbon dioxide concentrations ranged from 448 to 588 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 448 to 475 ppm. Carbon dioxide concentrations were within the comfort parameters established by ASHRAE in all areas monitored.

Carbon monoxide is mainly attributed to incomplete combustion. Concentrations of CO ranged from 0.1 to 0.3 ppm indoors and the outdoor concentration ranged from 0.1 to 1.0 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 $\mu g/m^3$ and 50 $\mu g/m^3$, 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.

**Spore Sampling Report**
**For Glenwood Middle School**
**December 21, 2015**

**Table 2: Particle, Temperature, Relative Humidity, Carbon Dioxide and Carbon Monoxide Measurements Collected on December 21, 2015 at Glenwood Middle School**

| Location | Time | PM1 (µg/m³) | PM2.5 (µg/m³) | PM7 (µg/m³) | PM10 (µg/m³) | TSP (µg/m³) | Temp (°F) | Rh (%) | CO (ppm) | $CO_2$ (ppm) |
|---|---|---|---|---|---|---|---|---|---|---|
| CR 04 | 4:19 PM | 0 | 0 | 1 | 2 | 3 | 71.6 | **28.9** | 0.3 | 588 |
| CR 10 | 4:22 PM | 0 | 0 | 1 | 2 | 4 | 70.6 | **28.9** | 0.3 | 561 |
| CR 13 | 4:30 PM | 0 | 0 | 1 | 1 | 1 | 71.1 | **27.8** | 0.2 | 492 |
| CR 14 | 4:32 PM | 0 | 0 | 0 | 1 | 3 | 71.1 | **28.2** | 0.2 | 480 |
| CR 21 | 4:42 PM | 0 | 0 | 1 | 3 | 5 | 70.6 | **27.7** | 0.3 | 476 |
| CR 22 | 4:45 PM | 0 | 0 | 1 | 2 | 4 | 70.3 | **28.6** | 0.1 | 474 |
| CR 31 | 4:56 PM | 0 | 0 | 1 | 1 | 1 | 69.7 | **29.4** | 0.2 | 573 |
| CR 32 | 4:58 PM | 0 | 0 | 1 | 1 | 1 | 69.7 | **29.4** | 0.1 | 512 |
| PCR 60 | 5:11 PM | 0 | 0 | 0 | 0 | 0 | 70.2 | 33.3 | 0.1 | 448 |
| PCR 61 | 5:15 PM | 0 | 0 | 0 | 1 | 2 | **66.7** | 37.2 | 0.3 | 474 |
| Out 1 | 5:18 PM | 0 | 0 | 2 | 3 | 7 | 59.0 | 49.1 | 1.0 | 448 |
| Out 2 CY | 5:25 PM | 0 | 0 | 3 | 5 | 7 | 56.6 | 58.8 | 0.1 | 475 |

CR = Classroom; PCR = Portable Classroom; CY = Courtyard; Bold type indicates measurements outside of guidelines

## B. Air Monitoring for Fungal Identification and Counting on December 21, 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 4, 10, 13, 14, 21, 22, 31, 32 and two portable classrooms (60 and 61) 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 $m^3$) 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). Tables 3 and 4 present the results of the spore trap samples collected at Glenwood Middle School on December 21, 2015.

Indoor spore counts ranged from 33 to 373 total spores per cubic meter of air ($m^3$) in the main school building and from 167 to 373 in the portable classrooms on December 21, 2015. All indoor samples had total spore counts lower than the outdoor samples which ranged from 5,673 to 6,600 spores per $m^3$. All individual spore types detected indoors had counts lower than the outdoor sample counts except for Curvularia spores found in the Classroom 4 sample at 7 spores/$m^3$ and Pithomyces spores found in the Classrooms 10 and 21 samples at 7 and 13 spores/$m^3$, respectively. These spores were not detected in the outdoor samples. A spore count of 7 spores/$m^3$ is equivalent to 1 spore counted in the sample. Windows were not open during sampling. Curvularia and Pithomyces spores, according to a recent literature review, are mostly plant pathogens. All other spore types detected indoors were lower than the outdoor samples.

No secondary colonizers including Chaetomium or Stachybotrys were detected in the indoor air samples. Hyphal elements were not detected in any of the ten indoor samples. The outdoor sample hyphal element counts ranged from 20 to 67 elements per $m^3$. 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.

**Spore Sampling Report**
**For Glenwood Middle School**
**December 21, 2015**

**Table 3: Results of Spore Trap Sampling in Selected Classrooms in Glenwood Middle School on December 21, 2015**

| Location | Outside near PCR 60 (Out 1) | Outside in Courtyard (Out 2) | Room 04 (GM 04) | Room 10 (GM 10) | Room 13 (GM 13) | Room 14 (GM 14) | Room 21 (GM 21) | Room 22 (GM 22) | Room 31 (GM 31) | Room 32 (GM 32) |
|---|---|---|---|---|---|---|---|---|---|---|
| Spore Type | Spores/ $m^3$ | Spores/ $m^3$ | Spores/ $m^3$ | Spores/ $m^3$ | Spores/ $m^3$ | Spores/ $m^3$ | Spores/ $m^3$ | Spores/ $m^3$ | Spores/ $m^3$ | Spores/ $m^3$ |
| Alternaria | - | 27 | - | - | - | 7 | - | - | - | - |
| Ascospores | 93 | 80 | - | - | - | 13 | 13 | 7 | - | 13 |
| Basidiospores | 5,013 | 5,760 | 33 | 20 | 33 | 193 | 300 | 107 | 120 | 160 |
| Cladosporium | 267 | 240 | - | 13 | - | 27 | 27 | 7 | 7 | 7 |
| Curvularia | - | - | **7** | - | - | - | - | - | - | - |
| Epicoccum | 7 | 87 | - | - | - | - | - | - | - | - |
| Hyphal Elements | 20 | 67 | - | - | - | - | - | - | - | - |
| Oidium | - | 7 | - | - | - | - | - | - | - | - |
| Penicillium/ Aspergillus | 220 | 53 | 20 | 33 | - | 20 | 7 | 13 | 20 | 13 |
| Pithomyces | - | - | - | **7** | - | - | **13** | - | - | - |
| Rusts | - | 60 | - | - | - | - | - | - | - | - |
| Smuts, Periconia, myxomycetes | 53 | 200 | - | 13 | - | 13 | 13 | 7 | - | - |
| Unknown | - | 20 | - | - | - | - | - | - | - | - |
| Total Fungi | 5,673 | 6,600 | 60 | 87 | 33 | 273 | 373 | 140 | 147 | 193 |

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

**Spore Sampling Report**
**For Glenwood Middle School**
**December 21, 2015**

**Table 4: Results of Spore Trap Sampling in Portable Classrooms at Glenwood Middle School on December 21, 2015**

| Location | Outside near Room 60 (Out 1) | Outside in Courtyard (Out 2) | Room 60 (GM 60) | Room 61 (GM 61) |
|---|---|---|---|---|
| **Spore Type** | **Spores/ $m^3$** | **Spores/ $m^3$** | **Spores/ $m^3$** | **Spores/ $m^3$** |
| **Alternaria** | - | 27 | - | - |
| **Ascospores** | 93 | 80 | - | 20 |
| **Basidiospores** | 5,013 | 5,760 | 140 | 300 |
| **Cladosporium** | 267 | 240 | 13 | 20 |
| **Curvularia** | - | - | - | - |
| **Epicoccum** | 7 | 87 | - | - |
| **Hyphal Elements** | 20 | 67 | - | - |
| **Oidium** | - | 7 | - | - |
| **Penicillium/ Aspergillus** | 220 | 53 | 13 | 27 |
| **Pithomyces** | - | - | - | - |
| **Rusts** | - | 60 | - | - |
| **Smuts, Periconia, myxomycetes** | 53 | 200 | - | 7 |
| **Unknown** | - | 20 | - | - |
| **Total Fungi** | 5,673 | 6,600 | 167 | 373 |

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

## 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 December 21, 2015.

Thermal comfort parameters of temperature and humidity were measured. Temperature measurements were within the comfort ranges established by ASHRAE except for temperature measurements in Portable Classroom 61 where the temperature was slightly below the comfort range. Relative humidity measurements were mostly slightly below the comfort ranges which is expected during the heating season. Carbon dioxide, carbon monoxide and particulate matter measurements were within acceptable ranges for good indoor air quality in all areas monitored.

Indoor spore counts ranged from 33 to 373 total spores per cubic meter of air ($m^3$) in the main school building classrooms and from 167 to 373 in the portable classrooms on December 21, 2015. All indoor samples had total spore counts lower than the outdoor samples which ranged from 5,673 to 6,600 spores/ $m^3$. All individual spore types detected indoors had counts lower than the outdoor sample counts except for Curvularia spores found in the Classroom 4 sample and Pithomyces spores found in the Classrooms 10 and 21 samples at low counts. Hyphal elements were not detected in any of the ten indoor samples, and outdoor hyphal elements ranged from 20 to 67 hyphal elements/$m^3$. Windows were not open during sampling.

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**

| Date | Indoor Spore Count Range Spores per $m^3$ | Outdoor Spore Count Range Spores per $m^3$ |
|---|---|---|
| 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 |
| September 16, 2015 | 447 to 3,493 | 17,543 to 20,287 |
| September 24, 2015 | 273 to 2,480 | 24,680 to 25,020 |
| September 30, 2015 | 1,267 to 12,767 | 55,396 to 69,421 |
| October 7, 2015 | 213 to 14,120 | 49,146 to 51,759 |
| October 14, 2015 | 140 to 2,700 | 8,807 to 10,153 |
| October 21, 2015 | 307 to 2,367 | 11,447 to 20,560 |
| October 27, 2015 | 87 to 680 | 8,827 to 9,427 |
| November 4, 2015 | 73 to 780 | 26,592 to 27,484 |
| November 11, 2015 | 133 to 6,427 | 23,808 to 28,018 |
| November 18, 2015 | 40 to 673 | 3,080 to 3,553 |
| November 25, 2015 | 53 to 333 | 4,827 to 5,747 |
| December 3, 2015 | 100 to 4,900 | 5,340 to 6,207 |
| December 9, 2015 | 40 to 187 | 10,940 to 11,087 |
| December 16, 2015 | 33 to 1,320 | 5,920 to 11,995 |
| December 21, 2015 | 33 to 373 | 5,673 to 6,600 |

Spore measurements collected in classrooms were generally acceptable compared to outdoor samples with outdoor total spore counts over 33 times higher on average than the indoor counts. 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 December 28, 2015 and will be performed regularly in order to monitor changes in conditions affected by seasonal variations and the new HVAC system.

## IV. LIMITATIONS

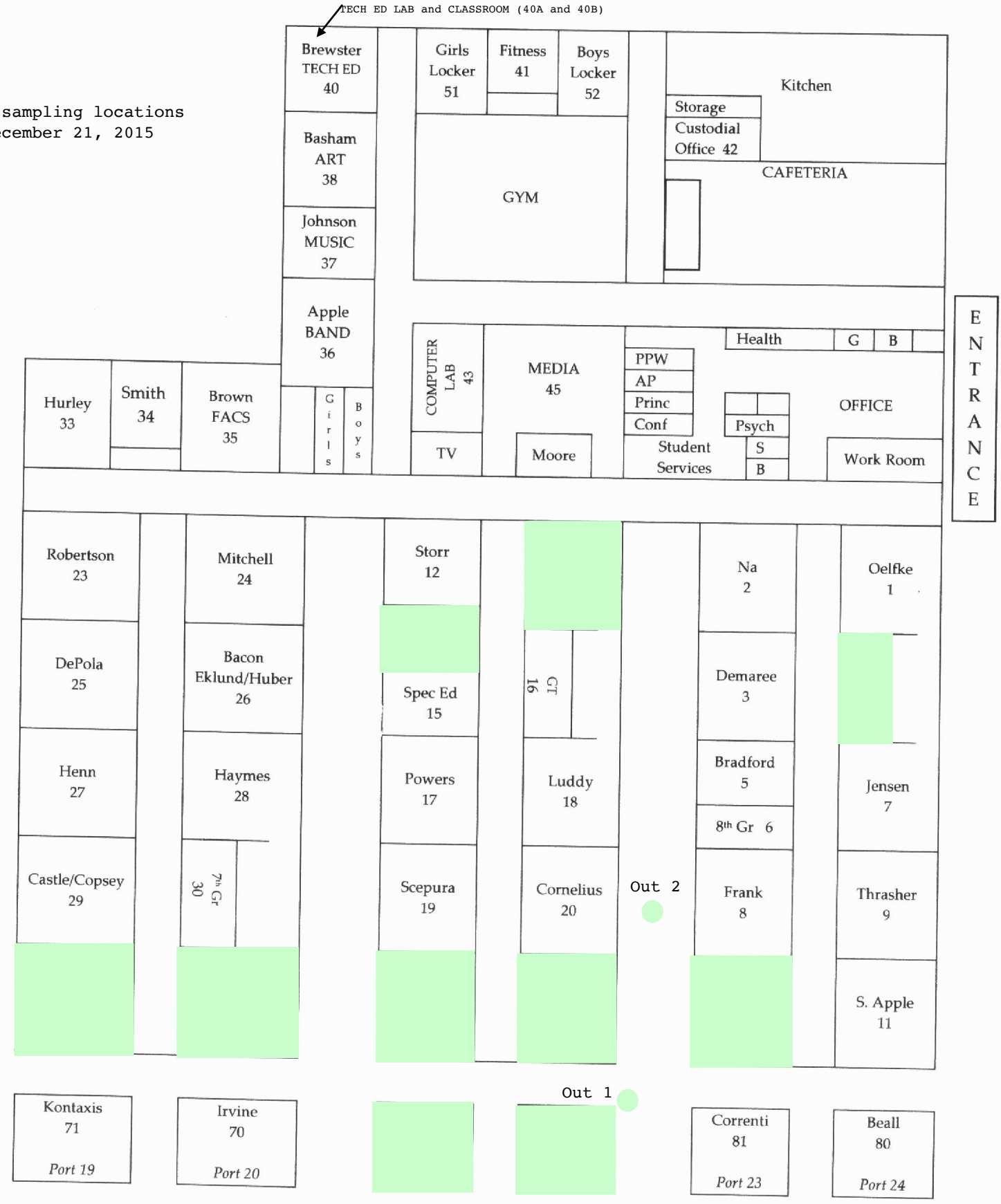
This report has been prepared for the exclusive use of the Howard County Public School System and/or their agents. This service has been performed in accordance with generally accepted environmental practices. No other warranty, expressed or implied, is made. Our conclusions and recommendations are based, in part, upon information provided to us by others and our site 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 my 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 December 21, 2015

Spore sampling locations
for December 21, 2015




Glenwood Middle School Floor Plan

As of 8/02/13

**Attachment B:**

**Report of Analysis and Chain of Custody Forms**
**December 21, 2015**

Aerobiology Laboratory Associates, Incorporated
Expertise Since 1997

43760 Trade Center Place
Suite 100
Sterling, Virginia 20166
(877) 648-9150
www.aerobiology.net

**Certificate of Analysis**
EMLAP# 102977

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: 12/21/2015
Date Received: 12/23/2015
Date Analyzed: 12/29/2015
Date Reported: 12/29/2015
Project ID: 15033884


1054 Spore Trap Analysis: SOP 3.8

| Client Sample Number | **GM-04** | | | | **Out 2 CY** | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Location | **Room 04** | | | | **Outside Courtyard** | | | |
| Sample Volume (L) | **150** | | | | **150** | | | |
| Lab Sample Number | **15033884-001** | | | | **15033884-012** | | | |
| **Spore Identification** | Raw Ct | spr/m³ | % Ttl | In/Out | Raw Ct | spr/m³ | % Ttl | In/Out |
| Alternaria | - | - | - | - | 4 | 27 | <1 | - |
| ascospores | - | - | - | - | 12 | 80 | 1 | - |
| basidiospores | 5 | 33 | 56 | 1/173 | 54 | 5760 | 87 | - |
| Cladosporium | - | - | - | - | 36 | 240 | 4 | - |
| Curvularia | 1 | 7 | 11 | - | - | - | - | - |
| Epicoccum | - | - | - | - | 13 | 87 | 1 | - |
| hyphal elements | - | - | - | - | 10 | 67 | 1 | - |
| Oidium | - | - | - | - | 1 | 7 | <1 | - |
| Penicillium/Aspergillus group | 3 | 20 | 33 | 1/3 | 8 | 53 | 1 | - |
| Rusts | - | - | - | - | 9 | 60 | 1 | - |
| Smuts,Periconia,Myxomycetes | - | - | - | - | 30 | 200 | 3 | - |
| Unknown | - | - | - | - | 3 | 20 | <1 | - |
| | Debris Rating **2** | | | | Debris Rating **3** | | | |
| Analytical Sensitivity | Analytical Sensitivity: **7** spr/m³ | | | | Analytical Sensitivity: **7** spr/m³ | | | |
| Comments | | | | | | | | |
| Total *See Footnotes | 9 | 60 | ~100% | 1/110 | 180 | 6600 | ~100% | - |

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**Certificate of Analysis**
EMLAP# 102977

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: 12/21/2015
Date Received: 12/23/2015
Date Analyzed: 12/29/2015
Date Reported: 12/29/2015
Project ID: 15033884


| Client Sample Number | **GM-10** | | | | **Out 2 CY** | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Location | **Classroom 10** | | | | **Outside Courtyard** | | | |
| Sample Volume (L) | **150** | | | | **150** | | | |
| Lab Sample Number | **15033884-002** | | | | **15033884-012** | | | |
| **Spore Identification** | Raw Ct | spr/m³ | % Ttl | In/Out | Raw Ct | spr/m³ | % Ttl | In/Out |
| Alternaria | - | - | - | - | 4 | 27 | <1 | - |
| ascospores | - | - | - | - | 12 | 80 | 1 | - |
| basidiospores | 3 | 20 | 23 | 1/288 | 54 | 5760 | 87 | - |
| Cladosporium | 2 | 13 | 15 | 1/18 | 36 | 240 | 4 | - |
| Epicoccum | - | - | - | - | 13 | 87 | 1 | - |
| hyphal elements | - | - | - | - | 10 | 67 | 1 | - |
| Oidium | - | - | - | - | 1 | 7 | <1 | - |
| Penicillium/Aspergillus group | 5 | 33 | 38 | 1/2 | 8 | 53 | 1 | - |
| Pithomyces | 1 | 7 | 8 | - | - | - | - | - |
| Rusts | - | - | - | - | 9 | 60 | 1 | - |
| Smuts,Periconia,Myxomycetes | 2 | 13 | 15 | 1/15 | 30 | 200 | 3 | - |
| Unknown | - | - | - | - | 3 | 20 | <1 | - |
| | Debris Rating **3** | | | | Debris Rating **3** | | | |
| Analytical Sensitivity | Analytical Sensitivity: **7** spr/m³ | | | | Analytical Sensitivity: **7** spr/m³ | | | |
| Comments | | | | | | | | |
| Total *See Footnotes | 13 | 87 | ~100% | 1/76 | 180 | 6600 | ~100% | - |

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**Certificate of Analysis**
EMLAP# 102977

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Suite 100
Sterling, Virginia 20166
(877) 648-9150
www.aerobiology.net

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: 12/21/2015
Date Received: 12/23/2015
Date Analyzed: 12/29/2015
Date Reported: 12/29/2015
Project ID: 15033884


| Client Sample Number | **GM-13** | | | | **Out 2 CY** | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Location | **Classroom 13** | | | | **Outside Courtyard** | | | |
| Sample Volume (L) | **150** | | | | **150** | | | |
| Lab Sample Number | **15033884-003** | | | | **15033884-012** | | | |
| **Spore Identification** | Raw Ct | spr/m³ | % Ttl | In/Out | Raw Ct | spr/m³ | % Ttl | In/Out |
| Alternaria | - | - | - | - | 4 | 27 | <1 | - |
| ascospores | - | - | - | - | 12 | 80 | 1 | - |
| basidiospores | 5 | 33 | 100 | 1/173 | 54 | 5760 | 87 | - |
| Cladosporium | - | - | - | - | 36 | 240 | 4 | - |
| Epicoccum | - | - | - | - | 13 | 87 | 1 | - |
| hyphal elements | - | - | - | - | 10 | 67 | 1 | - |
| Oidium | - | - | - | - | 1 | 7 | <1 | - |
| Penicillium/Aspergillus group | - | - | - | - | 8 | 53 | 1 | - |
| Rusts | - | - | - | - | 9 | 60 | 1 | - |
| Smuts,Periconia,Myxomycetes | - | - | - | - | 30 | 200 | 3 | - |
| Unknown | - | - | - | - | 3 | 20 | <1 | - |
| | Debris Rating **2** | | | | Debris Rating **3** | | | |
| Analytical Sensitivity | Analytical Sensitivity: **7** spr/m³ | | | | Analytical Sensitivity: **7** spr/m³ | | | |
| Comments | | | | | | | | |
| Total *See Footnotes | 5 | 33 | ~100% | 1/198 | 180 | 6600 | ~100% | - |

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Expertise Since 1997

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EMLAP# 102977

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Suite 100
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(877) 648-9150
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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: 12/21/2015
Date Received: 12/23/2015
Date Analyzed: 12/29/2015
Date Reported: 12/29/2015
Project ID: 15033884


| Client Sample Number | **GM-14** | | | | **Out 2 CY** | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Location | **Breakroom 14** | | | | **Outside Courtyard** | | | |
| Sample Volume (L) | **150** | | | | **150** | | | |
| Lab Sample Number | **15033884-004** | | | | **15033884-012** | | | |
| **Spore Identification** | Raw Ct | spr/m³ | % Ttl | In/Out | Raw Ct | spr/m³ | % Ttl | In/Out |
| Alternaria | 1 | 7 | 2 | 1/4 | 4 | 27 | <1 | - |
| ascospores | 2 | 13 | 5 | 1/6 | 12 | 80 | 1 | - |
| basidiospores | 29 | 193 | 71 | 1/30 | 54 | 5760 | 87 | - |
| Cladosporium | 4 | 27 | 10 | 1/9 | 36 | 240 | 4 | - |
| Epicoccum | - | - | - | - | 13 | 87 | 1 | - |
| hyphal elements | - | - | - | - | 10 | 67 | 1 | - |
| Oidium | - | - | - | - | 1 | 7 | <1 | - |
| Penicillium/Aspergillus group | 3 | 20 | 7 | 1/3 | 8 | 53 | 1 | - |
| Rusts | - | - | - | - | 9 | 60 | 1 | - |
| Smuts,Periconia,Myxomycetes | 2 | 13 | 5 | 1/15 | 30 | 200 | 3 | - |
| Unknown | - | - | - | - | 3 | 20 | <1 | - |
| | Debris Rating **3** | | | | Debris Rating **3** | | | |
| Analytical Sensitivity | Analytical Sensitivity: **7** spr/m³ | | | | Analytical Sensitivity: **7** spr/m³ | | | |
| Comments | | | | | | | | |
| Total *See Footnotes | 41 | 273 | ~100% | 1/24 | 180 | 6600 | ~100% | - |

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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: 12/21/2015
Date Received: 12/23/2015
Date Analyzed: 12/29/2015
Date Reported: 12/29/2015
Project ID: 15033884


| Client Sample Number | **GM-21** | | | | **Out 2 CY** | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Location | **Glassroom 21** | | | | **Outside Courtyard** | | | |
| Sample Volume (L) | **150** | | | | **150** | | | |
| Lab Sample Number | **15033884-005** | | | | **15033884-012** | | | |
| **Spore Identification** | Raw Ct | spr/m³ | % Ttl | In/Out | Raw Ct | spr/m³ | % Ttl | In/Out |
| Alternaria | - | - | - | - | 4 | 27 | <1 | - |
| ascospores | 2 | 13 | 4 | 1/6 | 12 | 80 | 1 | - |
| basidiospores | 45 | 300 | 80 | 1/19 | 54 | 5760 | 87 | - |
| Cladosporium | 4 | 27 | 7 | 1/9 | 36 | 240 | 4 | - |
| Epicoccum | - | - | - | - | 13 | 87 | 1 | - |
| hyphal elements | - | - | - | - | 10 | 67 | 1 | - |
| Oidium | - | - | - | - | 1 | 7 | <1 | - |
| Penicillium/Aspergillus group | 1 | 7 | 2 | 1/8 | 8 | 53 | 1 | - |
| Pithomyces | 2 | 13 | 4 | - | - | - | - | - |
| Rusts | - | - | - | - | 9 | 60 | 1 | - |
| Smuts,Periconia,Myxomycetes | 2 | 13 | 4 | 1/15 | 30 | 200 | 3 | - |
| Unknown | - | - | - | - | 3 | 20 | <1 | - |
| | Debris Rating **3** | | | | Debris Rating **3** | | | |
| Analytical Sensitivity | Analytical Sensitivity: **7** spr/m³ | | | | Analytical Sensitivity: **7** spr/m³ | | | |
| Comments | | | | | | | | |
| Total *See Footnotes | 56 | 373 | ~100% | 1/18 | 180 | 6600 | ~100% | - |

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

Date Collected: 12/21/2015
Date Received: 12/23/2015
Date Analyzed: 12/29/2015
Date Reported: 12/29/2015
Project ID: 15033884


| Client Sample Number | **GM-22** | | | | **Out 2 CY** | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Location | **Classroom 22** | | | | **Outside Courtyard** | | | |
| Sample Volume (L) | **150** | | | | **150** | | | |
| Lab Sample Number | **15033884-006** | | | | **15033884-012** | | | |
| **Spore Identification** | Raw Ct | spr/m³ | % Ttl | In/Out | Raw Ct | spr/m³ | % Ttl | In/Out |
| Alternaria | - | - | - | - | 4 | 27 | <1 | - |
| ascospores | 1 | 7 | 5 | 1/12 | 12 | 80 | 1 | - |
| basidiospores | 16 | 107 | 76 | 1/54 | 54 | 5760 | 87 | - |
| Cladosporium | 1 | 7 | 5 | 1/36 | 36 | 240 | 4 | - |
| Epicoccum | - | - | - | - | 13 | 87 | 1 | - |
| hyphal elements | - | - | - | - | 10 | 67 | 1 | - |
| Oidium | - | - | - | - | 1 | 7 | <1 | - |
| Penicillium/Aspergillus group | 2 | 13 | 10 | 1/4 | 8 | 53 | 1 | - |
| Rusts | - | - | - | - | 9 | 60 | 1 | - |
| Smuts,Periconia,Myxomycetes | 1 | 7 | 5 | 1/30 | 30 | 200 | 3 | - |
| Unknown | - | - | - | - | 3 | 20 | <1 | - |
| | Debris Rating **3** | | | | Debris Rating **3** | | | |
| Analytical Sensitivity | Analytical Sensitivity: **7** spr/m³ | | | | Analytical Sensitivity: **7** spr/m³ | | | |
| Comments | | | | | | | | |
| Total *See Footnotes | 21 | 140 | ~100% | 1/47 | 180 | 6600 | ~100% | - |

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Attn: Julie Barth
Project: **J15-876 GMS Glenwood MS**
Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 12/21/2015
Date Received: 12/23/2015
Date Analyzed: 12/29/2015
Date Reported: 12/29/2015
Project ID: 15033884


| Client Sample Number | **GM-31** | | | | **Out 2 CY** | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Location | **Classroom 31** | | | | **Outside Courtyard** | | | |
| Sample Volume (L) | **150** | | | | **150** | | | |
| Lab Sample Number | **15033884-007** | | | | **15033884-012** | | | |
| **Spore Identification** | Raw Ct | spr/m³ | % Ttl | In/Out | Raw Ct | spr/m³ | % Ttl | In/Out |
| Alternaria | - | - | - | - | 4 | 27 | <1 | - |
| ascospores | - | - | - | - | 12 | 80 | 1 | - |
| basidiospores | 18 | 120 | 82 | 1/48 | 54 | 5760 | 87 | - |
| Cladosporium | 1 | 7 | 5 | 1/36 | 36 | 240 | 4 | - |
| Epicoccum | - | - | - | - | 13 | 87 | 1 | - |
| hyphal elements | - | - | - | - | 10 | 67 | 1 | - |
| Oidium | - | - | - | - | 1 | 7 | <1 | - |
| Penicillium/Aspergillus group | 3 | 20 | 14 | 1/3 | 8 | 53 | 1 | - |
| Rusts | - | - | - | - | 9 | 60 | 1 | - |
| Smuts,Periconia,Myxomycetes | - | - | - | - | 30 | 200 | 3 | - |
| Unknown | - | - | - | - | 3 | 20 | <1 | - |
| | Debris Rating **2** | | | | Debris Rating **3** | | | |
| Analytical Sensitivity | Analytical Sensitivity: **7** spr/m³ | | | | Analytical Sensitivity: **7** spr/m³ | | | |
| Comments | | | | | | | | |
| Total *See Footnotes | 22 | 147 | ~100% | 1/45 | 180 | 6600 | ~100% | - |

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Attn: Julie Barth
Project: **J15-876 GMS Glenwood MS**
Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 12/21/2015
Date Received: 12/23/2015
Date Analyzed: 12/29/2015
Date Reported: 12/29/2015
Project ID: 15033884


| Client Sample Number | **GM-32** | | | | **Out 2 CY** | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Location | **Classroom 32** | | | | **Outside Courtyard** | | | |
| Sample Volume (L) | **150** | | | | **150** | | | |
| Lab Sample Number | **15033884-008** | | | | **15033884-012** | | | |
| **Spore Identification** | Raw Ct | spr/m³ | % Ttl | In/Out | Raw Ct | spr/m³ | % Ttl | In/Out |
| Alternaria | - | - | - | - | 4 | 27 | <1 | - |
| ascospores | 2 | 13 | 7 | 1/6 | 12 | 80 | 1 | - |
| basidiospores | 24 | 160 | 83 | 1/36 | 54 | 5760 | 87 | - |
| Cladosporium | 1 | 7 | 3 | 1/36 | 36 | 240 | 4 | - |
| Epicoccum | - | - | - | - | 13 | 87 | 1 | - |
| hyphal elements | - | - | - | - | 10 | 67 | 1 | - |
| Oidium | - | - | - | - | 1 | 7 | <1 | - |
| Penicillium/Aspergillus group | 2 | 13 | 7 | 1/4 | 8 | 53 | 1 | - |
| Rusts | - | - | - | - | 9 | 60 | 1 | - |
| Smuts,Periconia,Myxomycetes | - | - | - | - | 30 | 200 | 3 | - |
| Unknown | - | - | - | - | 3 | 20 | <1 | - |
| | Debris Rating **2** | | | | Debris Rating **3** | | | |
| Analytical Sensitivity | Analytical Sensitivity: **7** spr/m³ | | | | Analytical Sensitivity: **7** spr/m³ | | | |
| Comments | | | | | | | | |
| Total *See Footnotes | 29 | 193 | ~100% | 1/34 | 180 | 6600 | ~100% | - |

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Attn: Julie Barth
Project: **J15-876 GMS Glenwood MS**
Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 12/21/2015
Date Received: 12/23/2015
Date Analyzed: 12/29/2015
Date Reported: 12/29/2015
Project ID: 15033884


| Client Sample Number | **GM-60** | | | | **Out 2 CY** | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Location | **Portable Classroom 60** | | | | **Outside Courtyard** | | | |
| Sample Volume (L) | **150** | | | | **150** | | | |
| Lab Sample Number | **15033884-009** | | | | **15033884-012** | | | |
| **Spore Identification** | Raw Ct | spr/m³ | % Ttl | In/Out | Raw Ct | spr/m³ | % Ttl | In/Out |
| Alternaria | - | - | - | - | 4 | 27 | <1 | - |
| ascospores | - | - | - | - | 12 | 80 | 1 | - |
| basidiospores | 21 | 140 | 84 | 1/41 | 54 | 5760 | 87 | - |
| Cladosporium | 2 | 13 | 8 | 1/18 | 36 | 240 | 4 | - |
| Epicoccum | - | - | - | - | 13 | 87 | 1 | - |
| hyphal elements | - | - | - | - | 10 | 67 | 1 | - |
| Oidium | - | - | - | - | 1 | 7 | <1 | - |
| Penicillium/Aspergillus group | 2 | 13 | 8 | 1/4 | 8 | 53 | 1 | - |
| Rusts | - | - | - | - | 9 | 60 | 1 | - |
| Smuts,Periconia,Myxomycetes | - | - | - | - | 30 | 200 | 3 | - |
| Unknown | - | - | - | - | 3 | 20 | <1 | - |
| | Debris Rating **2** | | | | Debris Rating **3** | | | |
| Analytical Sensitivity | Analytical Sensitivity: **7** spr/m³ | | | | Analytical Sensitivity: **7** spr/m³ | | | |
| Comments | | | | | | | | |
| Total *See Footnotes | 25 | 167 | ~100% | 1/40 | 180 | 6600 | ~100% | - |

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Attn: Julie Barth
Project: **J15-876 GMS Glenwood MS**
Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 12/21/2015
Date Received: 12/23/2015
Date Analyzed: 12/29/2015
Date Reported: 12/29/2015
Project ID: 15033884


| Client Sample Number | **GM-61** | | | | **Out 2 CY** | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Location | **Portable Classroom 61** | | | | **Outside Courtyard** | | | |
| Sample Volume (L) | **150** | | | | **150** | | | |
| Lab Sample Number | **15033884-010** | | | | **15033884-012** | | | |
| **Spore Identification** | Raw Ct | spr/m³ | % Ttl | In/Out | Raw Ct | spr/m³ | % Ttl | In/Out |
| Alternaria | - | - | - | - | 4 | 27 | <1 | - |
| ascospores | 3 | 20 | 5 | 1/4 | 12 | 80 | 1 | - |
| basidiospores | 45 | 300 | 80 | 1/19 | 54 | 5760 | 87 | - |
| Cladosporium | 3 | 20 | 5 | 1/12 | 36 | 240 | 4 | - |
| Epicoccum | - | - | - | - | 13 | 87 | 1 | - |
| hyphal elements | - | - | - | - | 10 | 67 | 1 | - |
| Oidium | - | - | - | - | 1 | 7 | <1 | - |
| Penicillium/Aspergillus group | 4 | 27 | 7 | 1/2 | 8 | 53 | 1 | - |
| Rusts | - | - | - | - | 9 | 60 | 1 | - |
| Smuts,Periconia,Myxomycetes | 1 | 7 | 2 | 1/30 | 30 | 200 | 3 | - |
| Unknown | - | - | - | - | 3 | 20 | <1 | - |
| | Debris Rating **3** | | | | Debris Rating **3** | | | |
| Analytical Sensitivity | Analytical Sensitivity: **7** spr/m³ | | | | Analytical Sensitivity: **7** spr/m³ | | | |
| Comments | | | | | | | | |
| Total *See Footnotes | 56 | 373 | ~100% | 1/18 | 180 | 6600 | ~100% | - |

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Attn: Julie Barth
Project: **J15-876 GMS Glenwood MS**
Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 12/21/2015
Date Received: 12/23/2015
Date Analyzed: 12/29/2015
Date Reported: 12/29/2015
Project ID: 15033884


| Client Sample Number | **Out 1** | | | | **Out 2 CY** | | | |
|---|---|---|---|---|---|---|---|---|
| Sample Location | **Outside Near PCR 60** | | | | **Outside Courtyard** | | | |
| Sample Volume (L) | **150** | | | | **150** | | | |
| Lab Sample Number | **15033884-011** | | | | **15033884-012** | | | |
| **Spore Identification** | Raw Ct | spr/m³ | % Ttl | In/Out | Raw Ct | spr/m³ | % Ttl | In/Out |
| Alternaria | - | - | - | - | 4 | 27 | <1 | - |
| ascospores | 14 | 93 | 2 | 1/1 | 12 | 80 | 1 | - |
| basidiospores | 47 | 5013 | 88 | 1/1 | 54 | 5760 | 87 | - |
| Cladosporium | 40 | 267 | 5 | 1/1 | 36 | 240 | 4 | - |
| Epicoccum | 1 | 7 | <1 | 1/13 | 13 | 87 | 1 | - |
| hyphal elements | 3 | 20 | <1 | 1/3 | 10 | 67 | 1 | - |
| Oidium | - | - | - | - | 1 | 7 | <1 | - |
| Penicillium/Aspergillus group | 33 | 220 | 4 | 4/1 | 8 | 53 | 1 | - |
| Rusts | - | - | - | - | 9 | 60 | 1 | - |
| Smuts,Periconia,Myxomycetes | 8 | 53 | 1 | 1/4 | 30 | 200 | 3 | - |
| Unknown | - | - | - | - | 3 | 20 | <1 | - |
| | Debris Rating **3** | | | | Debris Rating **3** | | | |
| Analytical Sensitivity | Analytical Sensitivity: **7** spr/m³ | | | | Analytical Sensitivity: **7** spr/m³ | | | |
| Comments | | | | | | | | |
| Total *See Footnotes | 146 | 5673 | ~100% | 1/1 | 180 | 6600 | ~100% | - |

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Attn: Julie Barth
Project: **J15-876 GMS Glenwood MS**
Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 12/21/2015
Date Received: 12/23/2015
Date Analyzed: 12/29/2015
Date Reported: 12/29/2015
Project ID: 15033884


# Footnotes and Additional Report Information

## Debris Rating Table

| | | |
|---|---|---|
| 1 | Minimal (<5%) particular 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 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.

5. 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.

6. Dash (-) in this report, under raw count column means 'not detected (ND)'; otherwise 'not applicable' (NA).

7. 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.

8. Due to rounding totals may not equal 100%.

9. Analytical Sensitivity for each spores is different for Non-viable sample when the spores are read at different percentage.

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 considered (3) three. For example, a sample with a result of 55,443 spr/$m^3$ 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/$m^3$.

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

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Lab Use:
15 033884
150338841

Page 1 of 1

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

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

| | | | | | |
|---|---|---|---|---|---|
| Aerobiology Client | Aria Environmental, Inc. | | | | |
| Field Contact | Julie Barth | Collected By/Date: 12/21/15 | | Relinquished By/Date: 12/22/15 | |
| Reporting Address | PO Box 286, Woodbine, MD 21797 | Relinquished By/Date: 12/22/15 | | Received By/Date: 12/23/15 | |
| Billing Address | SAME | Sampler Type | Andersen____ SAS____ | SampleAire____ AeroTrap____ | Other Allergenco-D BioCulture____ |
| Phone/Fax | 410-549-5774/410-549-4488 | PO#/Job#: J15-876 GMS | | | |
| Reporting Email (s) | jbarth@ariaenviro.com | Project Name: Glenwood MS | | | |
| Routine ● | 24 Hour ○ Same Day ○ 4 Hour ○ 2 Hour ○ | 5 Day (Asbestos Only) | Notes: | | |
| SAMPLING LOCATION ZIP CODE | 21738 | CC Info: | | | |

| | Sample No. | Test Code | Sample Location | Total Volume/Area |
|---|---|---|---|---|
| 1 | GM-04 | 1054 | Room 04 | 150 L |
| 2 | GM-10 | 1054 | Classroom 10 | 150 L |
| 3 | GM-13 | 1054 | Classroom 13 | 150 L |
| 4 | GM-14 | 1054 | Break Room 14 | 150 L |
| 5 | GM-21 | 1054 | Classroom 21 | 150 L |
| 6 | GM-22 | 1054 | Classroom 22 | 150 L |
| 7 | GM-31 | 1054 | Classroom 31 | 150 L |
| 8 | GM-32 | 1054 | Classroom 32 | 150 L |
| 9 | GM-60 | 1054 | Portable Classroom 60 | 150 L |
| 10 | GM-61 | 1054 | Portable Classroom 61 | 150 L |
| 11 | Out 1 | 1054 | Outside near PCR 60 | 150 L |
| 12 | Out 2 CY | 1054 | Outside Courtyard | 150 L |
| 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 |
| 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 |

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