Windjammer Environmental LLC
6710 Oxon Hill Road
Suite 210
Oxon Hill, MD 20745
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December 17, 2020

Alex Baylor
Environmental Specialist
PGCPS Environmental Safety Office
13306 Old Marlboro Pike
Upper Marlboro, MD 20772
Alex.baylor@pgcps.org

Re: IAQ and Mold Assessment Report
Prince George's County Public Schools
John Hanson Montessori School

Dear Mr. Baylor,

Windjammer Environmental LLC (Windjammer) was contracted to conduct a visual assessment, measure indoor air quality (IAQ) parameters and sample for mold in a limited number of areas at the John Hanson Montessori School located at 6360 Oxon Hill Road, Oxon Hill, MD. This assessment is intended to check on effectiveness of operations activities that are focused on preventing conditions that can lead to the development of an environment which is historically associated with an increase in reports of poor IAQ. This assessment was conducted by Certified Industrial Hygienist (CIH) Katherine Dietrich on December 8, 2020.

This assessment included:

- Measurement of temperature, relative humidity, carbon dioxide ($CO_2$) and carbon monoxide (CO)
- Collection of nonviable airborne mold samples; and
- Visual assessment of select areas.

## Methods

A TSI IAQ-Calc Model 7545 was used to measure temperature, relative humidity, carbon dioxide ($CO_2$) and carbon monoxide (CO).

Air samples for non-viable airborne fungi were collected on Air-O-Cell cassettes using a Zefon Bio-Pump Plus portable sampler calibrated to collect 15 liters of air per minute (lpm). The sampling period for the all samples was five minutes.

Direct read instrumentation used were calibrated in accordance with the manufacturer's specifications prior to the start of this assessment.

All samples collected were hand delivered to and analyzed by AMA of Lanham, MD. AMA is accredited by the American Industrial Hygiene Association (AIHA) for microbial analysis and participates in the Environmental Microbiology Laboratory Accreditation Program (EMLAP).

## Guidance

The Occupational Safety and Health Administration's (OSHA) Permissible Exposure Limits (PELs) are the only enforceable regulatory standards for indoor air quality. However, other organizations such as the American Society of Heating Refrigeration and Air Conditioning Engineers (ASHRAE) and the Environmental Protection Agency (EPA) have developed widely accepted consensus standards that can be used to assess the suitability of indoor air quality.

### ASHRAE Standards

62.1-2013 and 55-2013 are consensus standards that outline acceptable practices for the design of ventilation systems in commercial and residential structures. Both documents were developed "to specify minimum ventilation rates and indoor air quality that will be acceptable to human occupants and are intended to minimize the potential for adverse health effects." The standards also consider chemical, physical, and biological contaminants and other factors that impact indoor air quality and affect occupant health and comfort.

ASHRAE 55-2013 recommends temperature and relative humidity ranges that are considered suitable for indoor air quality. Recommended ranges are as follows:

- Temperature be maintained between 67 and 82 degrees Fahrenheit ($^{o}$F)
- Relative humidity to be maintained below 65%

### Carbon Dioxide

$CO_2$ is widely used as a surrogate gas in the assessment of indoor air quality. It is a byproduct of respiration and can be used to determine the effectiveness and/or management of building ventilation systems. Based on ASHRAE recommendations, indoor $CO_2$ concentrations that are below 1000 parts per million (ppm) or have a differential of less than 700 ppm compared to outside concentrations are considered to be suitable.

For example, if outside $CO_2$ concentrations are measured at 380 ppm, then indoor $CO_2$ concentrations measured up to 1080 ppm would be considered suitable.

### Carbon Monoxide

OSHA has established a PEL for CO of 35 ppm over a time weighted average (TWA) of 8 hours and a ceiling CO exposure limit of 200 ppm in a five-minute period. ASHARE has adopted the EPA National Ambient Air Quality Standard (NAAQS) for CO of 9 ppm when evaluating indoor air quality. In nonindustrial settings, the NAAQS standard is commonly used to assess the suitability of IAQ.

Nonviable Airborne Fungi (Mold)

There are no set regulatory limits established for acceptable airborne fungi levels. However, indoor levels within schools and offices are generally lower than outdoor levels except during the winter when outdoor mold may be less active or after rain events. The distribution of airborne species of fungi found in indoor air is expected to be similar in proportion to outside distributions. The type and concentrations of the airborne microorganisms can be used to determine if there is a potential hazard to occupants which requires action.

## Findings

Indoor Air Quality

Indoor air quality measurements collected were satisfactory with respect to relative humidity, carbon dioxide ($CO_2$), and carbon monoxide (CO). The temperature was lower than recommended but as the facility was not in use this may be within operating guidance. One room was occupied (Room 116) by a teacher giving a class online – it did not feel too cold, but that may have been because of the aquariums and plants present which raised the humidity. Recorded indoor air quality results are summarized in the following Table.

**Table 1**
**Indoor Air Quality Measurement Summary**
**(Measurements Recorded on December 8, 2020)**

| Measurement Location | Temperature (°F) | Relative Humidity (%) | $CO_2$ (ppm) | CO (ppm) |
|---|---|---|---|---|
| Cafetorium* | 68.2 | 27.0 | 409 | 0.0 |
| Room 113 (small gym)* | 69.0 | 23.4 | 404 | 0.0 |
| Room 115* | 66.0 | 29.5 | 432 | 0.0 |
| Room 116 | 66.2 | 58.1 | 493 | 0.0 |
| Room 119* | 62.7 | 41.9 | 416 | 0.0 |
| Room 123 | 62.5 | 35.8 | 402 | 0.0 |
| Room 204* | 62.6 | 43.1 | 412 | 0.0 |
| Room 214 | 60.7 | 36.0 | 416 | 0.0 |
| Room 201* | 64.4 | 27.0 | 437 | 0.0 |
| Library* | 66.8 | 48.1 | 412 | 0.0 |
| Room 105 | 59.1 | 30.5 | 395 | 0.0 |
| Gymnasium | 63.1 | 39.2 | 401 | 0.0 |
| Room 100-B | 59.2 | 52.2 | 405 | 0.0 |
| Outdoors* | 40.1 | 37.9 | 397 | 0.0 |

ppm – parts per million
* - spore-trap sample

Non-viable Airborne Fungi Sampling

With the exception of the Library and Room 119, measured total indoor airborne fungi concentrations were determined have a normal ecology when compared to the outdoor sample. The weather was cold



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and breezy outdoors which may explain why several of the indoor measurements were higher in comparison – however, all observations were in the range of what might be encountered in a typical indoor environment. A complete laboratory analysis report is available for viewing in Attachment A.

Visual Assessment

A walk-through of the hallways and a limited number of classrooms and public areas was carried out. No bathrooms, mechanical rooms, kitchen areas, offices or storage areas were visited. There were a limited number of staff present and no students.

Other than Room 100-B which had a newly waxed floor, no unexpected odors were detected. A mask was worn throughout the inspection. Except as noted, floors, walls and ceiling tiles observed were in acceptable condition. The housekeeping was acceptable.

The following areas for further investigation or improvement were noted:

- Cafetorium – Area of peeling paint next to windows on east side (approximately 10 square feet).
- Room 113 – dirt and rust on induction unit grilles.
- Room 119 – storage on top of induction unit grilles, paint by windows in poor condition.
- Hallway behind stage – spots on ceiling tiles.
- Library – stained ceiling tiles (approximately 1 square foot) in SE corner by windows.

## Conclusions & Recommendations

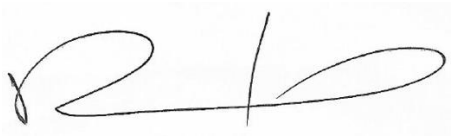
The Library and Room 119 had spore trap ecology which was different than the typical or outdoor ecology. The Library had a small area of water damage and also had a carpeted floor. Room 119 had storage on top of the induction grilles which may be blocking air circulation in addition to an area of possible water damage. For the other areas, the results are an indication that the spores sampled in the rooms assessed are more likely to be originating in the outdoor environment rather than an interior source - reducing the chance of undetected overgrowth or colonization in the building. While there are no standards for airborne levels of mold, this approach of comparing indoor to outdoor, and looking at the species found, is one tool identified by organizations such as the American Industrial Hygiene Association when identifying assessment methods and improvement measurement in indoor air quality. Please note the following considerations for improvement.

- Identify the cause of any staining on ceiling tiles and fix.
- Clean and dry carpet in Library if it is wet or becomes wet.
- Repaint areas of damaged paint after fixing the reason that the paint became damaged.
- Do not store items in front or on top of induction units and keep the grilles clean.

At this time, no other recommendations are provided.

Windjammer appreciates the opportunity to provide this indoor air quality assessment. If you have any questions or comments, please feel free to contact us at (888) 270 - 8387.

Best regards,



Damien Hammond Sr, MS, CSP, CIH
President

Katherine (Kay) Dietrich, CIH, CSP
Certified Industrial Hygienist

Attachment A: Microbial Laboratory Report (Air)



Windjammer Environmental LLC
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# Attachment A



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# CERTIFICATE OF ANALYSIS

## ASTM D7391-09 Spore Trap Analysis Report

| | | | | | |
|---|---|---|---|---|---|
| **Chain of Custody:** | 624424 | **Job Name:** | PGCPS IAQ | **Date Submitted:** | 12/09/2020 |
| **Client:** | Windjammer Environmental | **Job Location:** | John Hanson Montessori | **Person Submitting:** | Kay Dietrich |
| **Address:** | 6710 Oxon Hill Road<br>Suite 210<br>National Harbor, MD 20745 | **Job Number:** | Not Provided | **Date Analyzed:** | 12/15/2020 |
| | | **P.O. Number:** | Not Provided | **Report Date:** | 12/15/2020 |
| **Attention:** | Kay Dietrich | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **AMA Sample #** | 624424-1 | **AMA Sample #** | 624424-2 | **AMA Sample #** | 624424-3 |
| **Client ID** | 201208-1 | **Client ID** | 201208-2 | **Client ID** | 201208-3 |
| **Analyst ID** | TLW | **Analyst ID** | TLW | **Analyst ID** | TLW |
| **Collection Apparatus** | Air-O-Cell | **Collection Apparatus** | Air-O-Cell | **Collection Apparatus** | Air-O-Cell |
| **Sample Volume (L)** | 75 | **Sample Volume (L)** | 75 | **Sample Volume (L)** | 75 |
| **Sample Condition** | Acceptable | **Sample Condition** | Acceptable | **Sample Condition** | Acceptable |
| **Debris Loading** | 1 | **Debris Loading** | 2 | **Debris Loading** | 1 |
| **Location** | Cafetorium | **Location** | Room 113 | **Location** | Room 115 |

| | Raw Ct | Trav/Flds | A.S. | sp/m$^3$ | % |
|---|---|---|---|---|---|
| Alternaria | | | | | |
| Ascospores | 1 | 15 | 52 | 52 | 4.5% |
| Basidiospores | 4 | 15 | 52 | 208 | 18.2% |
| Bipolaris/Drechslera/Helm. | | | | | |
| Chaetomium | | | | | |
| Cladosporium | 5 | 15 | 52 | 260 | 22.7% |
| Curvularia | | | | | |
| Penicillium / Aspergillus | 12 | 15 | 52 | 624 | 54.5% |
| Smuts/Periconia/Myxomycetes | | | | | |
| Stachybotrys/Memnoniella | | | | | |
| Ulocladium | | | | | |
| Unknown | | | | | |
| Other Colorless | | | | | |
| Rusts | | | | | |
| Hyphal Fragments* | 1 | 15 | 52 | 52 | 4.5% |
| **Total Raw Ct:** | 22 | | **Total sp/m$^3$:** | 1144 | |

**Comments**

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

**Comments**

| | Raw Ct | Trav/Flds | A.S. | sp/m$^3$ | % |
|---|---|---|---|---|---|
| Alternaria | | | | | |
| Ascospores | 1 | 15 | 52 | 52 | 12.5% |
| Basidiospores | 1 | 15 | 52 | 52 | 12.5% |
| Bipolaris/Drechslera/Helm. | | | | | |
| Chaetomium | | | | | |
| Cladosporium | | | | | |
| Curvularia | | | | | |
| Penicillium / Aspergillus | 5 | 15 | 52 | 260 | 62.5% |
| Smuts/Periconia/Myxomycetes | | | | | |
| Stachybotrys/Memnoniella | | | | | |
| Ulocladium | | | | | |
| Unknown | 1 | 15 | 52 | 52 | 12.5% |
| Other Colorless | | | | | |
| Rusts | | | | | |
| Hyphal Fragments* | | | | | |
| **Total Raw Ct:** | 8 | | **Total sp/m$^3$:** | 416 | |

**Comments**

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# CERTIFICATE OF ANALYSIS

## ASTM D7391-09 Spore Trap Analysis Report

| | | | | | |
|---|---|---|---|---|---|
| **Chain of Custody:** | 624424 | **Job Name:** | PGCPS IAQ | **Date Submitted:** | 12/09/2020 |
| **Client:** | Windjammer Environmental | **Job Location:** | John Hanson Montessori | **Person Submitting:** | Kay Dietrich |
| **Address:** | 6710 Oxon Hill Road<br>Suite 210<br>National Harbor, MD 20745 | **Job Number:** | Not Provided | **Date Analyzed:** | 12/15/2020 |
| | | **P.O. Number:** | Not Provided | **Report Date:** | 12/15/2020 |
| **Attention:** | Kay Dietrich | | | | |

| | | | | | |
|---|---|---|---|---|---|
| **AMA Sample #** | 624424-4 | **AMA Sample #** | 624424-5 | **AMA Sample #** | 624424-6 |
| **Client ID** | 201208-4 | **Client ID** | 201208-5 | **Client ID** | 201208-6 |
| **Analyst ID** | TLW | **Analyst ID** | TLW | **Analyst ID** | TLW |
| **Collection Apparatus** | Air-O-Cell | **Collection Apparatus** | Air-O-Cell | **Collection Apparatus** | Air-O-Cell |
| **Sample Volume (L)** | 75 | **Sample Volume (L)** | 75 | **Sample Volume (L)** | 75 |
| **Sample Condition** | Acceptable | **Sample Condition** | Acceptable | **Sample Condition** | Acceptable |
| **Debris Loading** | 1 | **Debris Loading** | 1 | **Debris Loading** | 1 |
| **Location** | Room 119 | **Location** | Room 204 | **Location** | Room 201 |

| | Raw Ct | Trav/Flds | A.S. | sp/m$^3$ | % |
|---|---|---|---|---|---|
| Alternaria | | | | | |
| Ascospores | 1 | 15 | 52 | 52 | 4.3% |
| Basidiospores | 8 | 15 | 52 | 416 | 34.8% |
| Bipolaris/Drechslera/Helm. | | | | | |
| Chaetomium | | | | | |
| Cladosporium | 3 | 15 | 52 | 156 | 13% |
| Curvularia | | | | | |
| Penicillium / Aspergillus | 11 | 15 | 52 | 572 | 47.8% |
| Smuts/Periconia/Myxomycetes | | | | | |
| Stachybotrys/Memnoniella | | | | | |
| Ulocladium | | | | | |
| Unknown | | | | | |
| Other Colorless | | | | | |
| Rusts | | | | | |
| Hyphal Fragments* | | | | | |
| **Total Raw Ct:** | 23 | **Total sp/m$^3$:** | | 1196 | |
| **Comments** | | | | | |

| | Raw Ct | Trav/Flds | A.S. | sp/m$^3$ | % |
|---|---|---|---|---|---|
| Alternaria | | | | | |
| Ascospores | 2 | 15 | 52 | 104 | 28.6% |
| Basidiospores | 2 | 15 | 52 | 104 | 28.6% |
| Bipolaris/Drechslera/Helm. | | | | | |
| Chaetomium | | | | | |
| Cladosporium | | | | | |
| Curvularia | | | | | |
| Penicillium / Aspergillus | 1 | 15 | 52 | 52 | 14.3% |
| Smuts/Periconia/Myxomycetes | 1 | 15 | 52 | 52 | 14.3% |
| Stachybotrys/Memnoniella | | | | | |
| Ulocladium | | | | | |
| Unknown | | | | | |
| Other Colorless | 1 | 15 | 52 | 52 | 14.3% |
| Rusts | | | | | |
| Hyphal Fragments* | 1 | 15 | 52 | 52 | 14.3% |
| **Total Raw Ct:** | 7 | **Total sp/m$^3$:** | | 364 | |
| **Comments** | | | | | |

| | Raw Ct | Trav/Flds | A.S. | sp/m$^3$ | % |
|---|---|---|---|---|---|
| Alternaria | | | | | |
| Ascospores | 2 | 15 | 52 | 104 | 22.2% |
| Basidiospores | 3 | 15 | 52 | 156 | 33.3% |
| Bipolaris/Drechslera/Helm. | | | | | |
| Chaetomium | | | | | |
| Cladosporium | 1 | 15 | 52 | 52 | 11.1% |
| Curvularia | | | | | |
| Penicillium / Aspergillus | 2 | 15 | 52 | 104 | 22.2% |
| Smuts/Periconia/Myxomycetes | Present | 15 | 52 | <52 | |
| Stachybotrys/Memnoniella | | | | | |
| Ulocladium | | | | | |
| Unknown | | | | | |
| Other Colorless | 1 | 15 | 52 | 52 | 11.1% |
| Rusts | | | | | |
| Hyphal Fragments* | | | | | |
| **Total Raw Ct:** | 9 | **Total sp/m$^3$:** | | 468 | |
| **Comments** | | | | | |

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# CERTIFICATE OF ANALYSIS

## ASTM D7391-09 Spore Trap Analysis Report

| | | | | | |
|---|---|---|---|---|---|
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| **Client:** | Windjammer Environmental | **Job Location:** | John Hanson Montessori | **Person Submitting:** | Kay Dietrich |
| **Address:** | 6710 Oxon Hill Road<br>Suite 210<br>National Harbor, MD 20745 | **Job Number:** | Not Provided | **Date Analyzed:** | 12/15/2020 |
| | | **P.O. Number:** | Not Provided | **Report Date:** | 12/15/2020 |
| **Attention:** | Kay Dietrich | | | | |

| | | | |
|---|---|---|---|
| **AMA Sample #** | 624424-7 | **AMA Sample #** | 624424-8 |
| **Client ID** | 201208-7 | **Client ID** | 201208-8 |
| **Analyst ID** | TLW | **Analyst ID** | TLW |
| **Collection Apparatus** | Air-O-Cell | **Collection Apparatus** | Air-O-Cell |
| **Sample Volume (L)** | 75 | **Sample Volume (L)** | 75 |
| **Sample Condition** | Acceptable | **Sample Condition** | Acceptable |
| **Debris Loading** | 2 | **Debris Loading** | 2 |
| **Location** | Library | **Location** | Outdoors |

| | Raw Ct | Trav/Flds | A.S. | sp/m$^3$ | % |
|---|---|---|---|---|---|
| Alternaria | | | | | |
| Ascospores | 4 | 15 | 52 | 208 | 11.1% |
| Basidiospores | 9 | 15 | 52 | 468 | 25% |
| Bipolaris/Drechslera/Helm. | | | | | |
| Chaetomium | | | | | |
| Cladosporium | 5 | 15 | 52 | 260 | 13.9% |
| Curvularia | | | | | |
| Penicillium / Aspergillus | 9 | 15 | 52 | 468 | 25% |
| Smuts/Periconia/Myxomycetes | 8 | 15 | 52 | 416 | 22.2% |
| Stachybotrys/Memnoniella | | | | | |
| Ulocladium | | | | | |
| Unknown | | | | | |
| Other Colorless | | | | | |
| Rusts | 1 | 15 | 52 | 52 | 2.8% |
| Hyphal Fragments* | 2 | 15 | 52 | 104 | 5.6% |
| **Total Raw Ct:** | 36 | | **Total sp/m$^3$:** | | 1872 |

**Comments**

| | Raw Ct | Trav/Flds | A.S. | sp/m$^3$ | % |
|---|---|---|---|---|---|
| Alternaria | | | | | |
| Ascospores | | | | | |
| Basidiospores | 4 | 15 | 52 | 208 | 25% |
| Bipolaris/Drechslera/Helm. | | | | | |
| Chaetomium | | | | | |
| Cladosporium | 1 | 15 | 52 | 52 | 6.3% |
| Curvularia | | | | | |
| Penicillium / Aspergillus | 2 | 15 | 52 | 104 | 12.5% |
| Smuts/Periconia/Myxomycetes | 1 | 15 | 52 | 52 | 6.3% |
| Stachybotrys/Memnoniella | | | | | |
| Ulocladium | | | | | |
| Unknown | | | | | |
| Other Colorless | 8 | 15 | 52 | 416 | 50% |
| Rusts | | | | | |
| Hyphal Fragments* | | | | | |
| **Total Raw Ct:** | 16 | | **Total sp/m$^3$:** | | 832 |

**Comments**

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# CERTIFICATE OF ANALYSIS

## ASTM D7391-09 Spore Trap Analysis Report

| | | | | | |
|---|---|---|---|---|---|
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| **Client:** | Windjammer Environmental | **Job Location:** | John Hanson Montessori | **Person Submitting:** | Kay Dietrich |
| **Address:** | 6710 Oxon Hill Road<br>Suite 210<br>National Harbor, MD 20745 | **Job Number:** | Not Provided | **Date Analyzed:** | 12/15/2020 |
| | | **P.O. Number:** | Not Provided | **Report Date:** | 12/15/2020 |
| **Attention:** | Kay Dietrich | | | | |

## Spore Comparison Guide

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

| Normal ecology | Slightly above normal ecology | Moderately above normal ecology | Substantially above normal ecology |
|---|---|---|---|

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

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

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

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

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# CERTIFICATE OF ANALYSIS

## ASTM D7391-09 Spore Trap Analysis Report

| | | | | | |
|---|---|---|---|---|---|
| **Chain of Custody:** | 624424 | **Job Name:** | PGCPS IAQ | **Date Submitted:** | 12/09/2020 |
| **Client:** | Windjammer Environmental | **Job Location:** | John Hanson Montessori | **Person Submitting:** | Kay Dietrich |
| **Address:** | 6710 Oxon Hill Road<br>Suite 210<br>National Harbor, MD 20745 | **Job Number:** | Not Provided | **Date Analyzed:** | 12/15/2020 |
| | | **P.O. Number:** | Not Provided | **Report Date:** | 12/15/2020 |
| **Attention:** | Kay Dietrich | | | | |

## General Comments, Disclaimers, and Footnotes

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

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

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

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

**Technical Director** Tristan Ward

# MOLD SPORE DESCRIPTIONS

## Ascospores

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

## Basidiospores

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

## Cladosporium

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

## Hyphal Fragments

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

## Other Colorless

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

## Penicillium/Aspergillus Like

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

## Rusts

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

## Smuts/Periconia/Myxomycetes

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

## Unknown Fungi

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

**AMA Analytical Services, Inc.**
Focused on Results www.amalab.com
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4475 Forbes Blvd. • Lanham, MD 20706
(301) 459-2640 • (800) 346-0961 • Fax (301) 459-2643

# CHAIN OF CUSTODY

(Please Refer To This Number For Inquires) 024424

**Mailing/Billing Information:**
1. Client Name: Windjammer Environmental
2. Address 1: 6710 Oxon Hill Rd, Suite 210
3. Address 2: National Harbor Maryland 20745
4. Address 3:
5. Phone #: 888-270-8387 Fax #:

**Submittal Information:**
1. Job Name: PCCPS IAQ
2. Job Location: John Hanson Montessori
3. Job #: P.O. #:
4. Contact Person: Kay Dietrich @ phone # 301-351-4213
5. Submitted by: Kay Dietrich Signature:

**Reporting Information (Results will be provided as soon as technically feasible):**

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

**NORMAL BUSINESS HOURS**
- ☐ Immediate ☐ 3 Day
- ☐ Next Day ☒ 5 Day + Date Due: 12/16/20
- ☐ 2 Day
- ☐ Results Required By Noon (EveryAttempt Will Be Made to Accomodate)

**REPORT TO:**
- ☐ Include COC/Field Data Sheets with Report
- ☐ Email: dietrich @ wjenviro.com
- ☒ ~~Fax~~ hammond@wjenviro.com
- ☐ Verbals:

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

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

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

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

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

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

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

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

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

**Fungal Analysis**
Collection Apparatus for Spore Traps/Air Samples:
Collection Media
- ☒ Spore-Trap 8 (QTY)
- ☐ Surface Swab (QTY)
- ☐ Surface Tape (QTY)
- ☐ Other (Specify ) (QTY)
- ☐ Surface Vacuum Dust (QTY)
- ☐ Culturable ID Genus (Media ) (QTY)
- ☐ Culturable ID Species (Media ) (QTY)

| CLIENT ID NUMBER | SAMPLE LOCATION/ IDENTIFICATION | DATE | VOLUME (LITERS) | WIPE AREA | ANALYSIS: TEM | PCM | PLM | LEAD | MOLD | MATRIX: AIR | BULK | DUST | WATER AND OTHER | SPORE TRAP | TAPE | SWAB | CLIENT CONTACT (LABORATORY STAFF ONLY) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 201208-1 | Cafetorium | 12/8 | 75 | | | | | | | | | | | ✓ | | | Date/Time: Contact: By: |
| -2 | Rm 113 | " | " | | | | | | | | | | | " | | | |
| -3 | Rm 115 | " | " | | | | | | | | | | | " | | | |
| -4 | Rm 119 | " | " | | | | | | | | | | | " | | | |
| -5 | Rm 204 | " | " | | | | | | | | | | | " | | | Date/Time: Contact: By: |
| -6 | Rm 201 | " | " | | | | | | | | | | | " | | | |
| -7 | Library | " | " | | | | | | | | | | | " | | | |
| -8 | Outdoors | " | " | | | | | | | | | | | " | | | |
| | | | | | | | | | | | | | | | | | Date/Time: Contact: By: |
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**LABORATORY STAFF ONLY: (CUSTODY)**
1. Date/Time RCVD: 12 / 9 / 20 @ 1100 Via: Tech By (Print): Sign:
2. Date/Time Analyzed: / / @ By (Print): Sign:
3. Results Reported To: Via: Date: / / Time: Initials:
4. Comments: