



## Environmental Hygiene Report

Submitted to: Mr. John Willabay  
Director of Facilities

### Poughkeepsie City School District

Prepared by: Brian Colandrea, Safety and Risk Coordinator

<b>Location</b>	Smith Early Learning Center
<b>Project No.</b>	033-1819
<b>Site Visits</b>	October 10, 2018
<b>Report Date</b>	October 23, 2018
<b>Investigator</b>	Brian Colandrea CMA #01300

**This survey is strictly limited to that which is identified in the Project Scope of the report. Dutchess County BOCES Health, Safety & Risk Management does not assert that all potential health or safety hazards at this site were evaluated during this investigation.**

Dutchess County Board of Cooperative Educational Services

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**Author's Note:** Parenthetical numerals at the end of a sentence reference the work with the corresponding notation in the **References** section. *Please read this report in its entirety, including any attached appendices, to fully understand this investigation.*

## **Executive Summary**

On October 8, 2018 the Facilities Department for the Poughkeepsie City School District (PCSD) requested that our office perform air sampling for airborne fungal spores in Smith Early Learning Center. On October 10 we performed the requested sampling. The results of the sampling revealed nothing of concern.

## **Project Scope**

Take air samples for fungal spores in corridors of Smith Early Learning Center. Review the data and prepare a written report for the PCSD.

## **Materials & Methods**

Air sampling for fungal spores was performed using a Zefon, Bio-Pump Plus calibrated to 15 liters per minute (LPM), each sample was collected for 6 minutes. Each air sample was collected on a Zefon Air-O-Cell cassette. The samples, once collected were then packaged and delivered via UPS to Aerobiology Laboratory Associates Inc., (AIHA-LAP EMLAP# 102747) located in Pennsauken, New Jersey for analysis. Each sample was taken by a NYS certified Mold Assessor (cert # MA01300).

## Results Summary

All sample results and other data were reported to the administration of the local educational agency (LEA) via phone, fax, or e-mail as they became available to our department.

**\*For Full Sampling Results See Appendix**

### Air Samples

Sample ID	Sample Location	Spore Identification in spr/m <sup>3</sup> *
1018-SE1	Basement by Room 26	ascospores- 1911 basidiospores- 1289 Cladosporium- 1422 hyphal elements- 89 Penicillium/Aspergillus- 622 Smuts, Periconia, Myxomycetes- 356
1018-SE2	Basement by Room 24	ascospores- 1200 basidiospores- 2044 Cladosporium- 1556 Penicillium/Aspergillus- 178 Smuts, Periconia, Myxomycetes- 178
1018-SE3	Corridor by Room 8	ascospores- 3333 basidiospores- 1067 Chaetomium- 44 Cladosporium- 3022 Penicillium/Aspergillus- 222 Smuts, Periconia, Myxomycetes- 533
1018-SE4	Corridor by Auditorium	ascospores- 1867 basidiospores- 533 Cladosporium- 2311 hyphal elements- 44 Pithomyces- 44 Smuts, Periconia, Myxomycetes- 2044
1018-SE5	Corridor by Room 12	ascospores- 5867 basidiospores- 3867 Cercospora- 44 Cladosporium- 4000 Epicoccum- 44 Nigrospora- 44 Penicillium/Aspergillus- 1244 Smuts, Periconia, Myxomycetes- 933

1018-SE6	Corridor by Room 20	ascospores- 9067 basidiospores- 5556 Cercospora- 178 Cladosporium- 4578 Epicoccum- 44 hyphal elements- 44 Penicillium/Aspergillus- 311 Smuts, Periconia, Myxomycetes- 178
1018-SE7	Outdoor Comparison Sample	Alternaria- 89 ascospores- 6311 basidiospores- 2889 Cercospora- 89 Cladosporium- 3244 Epicoccum- 44 hyphal elements- 89 Smuts, Periconia, Myxomycetes- 800

\*spores per cubic meter

## Discussion

The National Institute for Occupational Safety & Health (NIOSH), a division of the Center for Disease Control, uses the term Indoor Environmental Quality (IEQ) to describe the perception of the indoor environment by occupants of non-industrial facilities like offices and schools. Occupants of these facilities frequently report a variety of physical symptoms (e.g. headache, fatigue, eye & skin irritation) that they attribute to poor indoor air. If air is the culprit, there may be a number of causes, including chemical, physical, and biological contamination. These contaminants can create odors, cause occupant discomfort, and, occasionally, create a health hazard. Frequently the cause of poor indoor air quality is inadequate or poorly modulated ventilation. This can result in uneven heating and cooling (which can affect the comfort of building occupants) and the provision of inadequate outside air.

Bioaerosols, airborne particles that are living or originate from living organisms, are ubiquitous in nature and may be modified by human activities. (*I*) They become an occupational hygiene concern when, as a result of indoor sources, the kinds and levels of microorganisms inside a building or facility are

different than those in the surrounding outdoor environment. Microbiological growth inside building is normally the result of water intrusion (e.g. from roof leaks), standing water, or high humidity and dew point. Bioaerosols of concern include fungi, bacteria, viruses, allergens, and other metabolic by-products. Locating sources of bioaerosols inside buildings is heavily dependent upon good investigative techniques. Such techniques include, but are not wholly dependent upon, sampling. Sampling for bioaerosols includes air sampling and source (e.g. bulk, swab, tape-lift) sampling.

## **Comments & Recommendations**

On October 8, 2018 the Facilities Department for the Poughkeepsie City School District (PCSD) requested that our office perform air sampling for airborne fungal spores in Smith Early Learning Center. On October 10 we performed the requested sampling. The results of the sampling revealed nothing of concern. There are no recommendations at this time.

## **References**

1. **University of Minnesota:** *Fungal Glossary*. Minneapolis, MN: University of Minnesota, Department of Environmental health & Safety, 2004

# **Appendix'C**

## **"Laboratory Results**





Dutchess BOCES  
 5 Bocess Road  
 Poughkeepsie, New York 12601  
 Attn: Brian Colandrea  
 Project: **POUGHKEEPSIE CSD, SMITH ELC**  
 Condition of Sample(s) Upon Receipt: Acceptable

Date Collected: 10/10/2018  
 Date Received: 10/12/2018  
 Date Analyzed: 10/17/2018  
 Date Reported: 10/17/2018  
 Project ID: 18038676  
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## 1054 Spore Trap Analysis: SOP 3.8

Client Sample Number	1018-SE1				1018-SE7			
Sample Location	BASEMENT BY ROOM 26				OUTDOOR COMPARISON SAMPLE			
Sample Volume (L)	90				90			
Lab Sample Number	18038676-001				18038676-007			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	2	89	1	-
ascospores	43	1911	34	1/3	142	6311	47	-
basidiospores	29	1289	23	1/2	65	2889	21	-
Cercospora	-	-	-	-	2	89	1	-
Cladosporium	32	1422	25	1/2	73	3244	24	-
Epicoccum	-	-	-	-	1	44	<1	-
hyphal elements	2	89	2	1/1	2	89	1	-
Penicillium/Aspergillus group	14	622	11	-	-	-	-	-
Smuts,Periconia,Myxomycetes	8	356	6	1/2	18	800	6	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 11 spr/m <sup>3</sup>				Analytical Sensitivity: 11 spr/m <sup>3</sup>			
Comments								
Total *See Footnotes	128	5689	~100%	1/2	305	13556	~100%	-

Client Sample Number	1018-SE2				1018-SE7			
Sample Location	BASEMENT BY ROOM 24				OUTDOOR COMPARISON SAMPLE			
Sample Volume (L)	90				90			
Lab Sample Number	18038676-002				18038676-007			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	2	89	1	-
ascospores	27	1200	23	1/5	142	6311	47	-
basidiospores	46	2044	40	1/1	65	2889	21	-
Cercospora	-	-	-	-	2	89	1	-
Cladosporium	35	1556	30	1/2	73	3244	24	-
Epicoccum	-	-	-	-	1	44	<1	-
hyphal elements	-	-	-	-	2	89	1	-
Penicillium/Aspergillus group	4	178	3	-	-	-	-	-
Smuts,Periconia,Myxomycetes	4	178	3	1/5	18	800	6	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 11 spr/m <sup>3</sup>				Analytical Sensitivity: 11 spr/m <sup>3</sup>			
Comments								
Total *See Footnotes	116	5156	~100%	1/3	305	13556	~100%	-

Dutchess BOCES  
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Client Sample Number	1018-SE3				1018-SE7			
Sample Location	CORRIDOR BY ROOM 8				OUTDOOR COMPARISON SAMPLE			
Sample Volume (L)	90				90			
Lab Sample Number	18038676-003				18038676-007			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	2	89	1	-
ascospores	75	3333	41	1/2	142	6311	47	-
basidiospores	24	1067	13	1/3	65	2889	21	-
Cercospora	-	-	-	-	2	89	1	-
Chaetomium	1	44	1	-	-	-	-	-
Cladosporium	68	3022	37	1/1	73	3244	24	-
Epicoccum	-	-	-	-	1	44	<1	-
hyphal elements	-	-	-	-	2	89	1	-
Penicillium/Aspergillus group	5	222	3	-	-	-	-	-
Smuts,Periconia,Myxomycetes	12	533	6	1/2	18	800	6	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 11 spr/m <sup>3</sup>				Analytical Sensitivity: 11 spr/m <sup>3</sup>			
Comments								
Total *See Footnotes	185	8222	~100%	1/2	305	13556	~100%	-

Client Sample Number	1018-SE4				1018-SE7			
Sample Location	CORRIDOR BY AUDITORIUM				OUTDOOR COMPARISON SAMPLE			
Sample Volume (L)	90				90			
Lab Sample Number	18038676-004				18038676-007			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	2	89	1	-
ascospores	42	1867	27	1/3	142	6311	47	-
basidiospores	12	533	8	1/5	65	2889	21	-
Cercospora	-	-	-	-	2	89	1	-
Cladosporium	52	2311	34	1/1	73	3244	24	-
Epicoccum	-	-	-	-	1	44	<1	-
hyphal elements	1	44	1	1/2	2	89	1	-
Pithomyces	1	44	1	-	-	-	-	-
Smuts,Periconia,Myxomycetes	46	2044	30	3/1	18	800	6	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 11 spr/m <sup>3</sup>				Analytical Sensitivity: 11 spr/m <sup>3</sup>			
Comments								
Total *See Footnotes	154	6844	~100%	1/2	305	13556	~100%	-

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Client Sample Number	1018-SE5				1018-SE7			
Sample Location	CORRIDOR BY ROOM 12				OUTDOOR COMPARISON SAMPLE			
Sample Volume (L)	90				90			
Lab Sample Number	18038676-005				18038676-007			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	2	89	1	-
ascospores	132	5867	37	1/1	142	6311	47	-
basidiospores	87	3867	24	1/1	65	2889	21	-
Cercospora	1	44	<1	1/2	2	89	1	-
Cladosporium	90	4000	25	1/1	73	3244	24	-
Epicoccum	1	44	<1	1/1	1	44	<1	-
hyphal elements	-	-	-	-	2	89	1	-
Nigrospora	1	44	<1	-	-	-	-	-
Penicillium/Aspergillus group	28	1244	8	-	-	-	-	-
Smuts,Periconia,Myxomycetes	21	933	6	1/1	18	800	6	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 11 spr/m <sup>3</sup>				Analytical Sensitivity: 11 spr/m <sup>3</sup>			
Comments								
Total *See Footnotes	361	16044	~100%	1/1	305	13556	~100%	-

Client Sample Number	1018-SE6				1018-SE7			
Sample Location	CORRIDOR BY ROOM 20				OUTDOOR COMPARISON SAMPLE			
Sample Volume (L)	90				90			
Lab Sample Number	18038676-006				18038676-007			
Spore Identification	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out	Raw Ct	spr/m <sup>3</sup>	% Ttl	In/Out
Alternaria	-	-	-	-	2	89	1	-
ascospores	204	9067	45	1/1	142	6311	47	-
basidiospores	125	5556	28	2/1	65	2889	21	-
Cercospora	4	178	1	2/1	2	89	1	-
Cladosporium	103	4578	23	1/1	73	3244	24	-
Epicoccum	1	44	<1	1/1	1	44	<1	-
hyphal elements	1	44	<1	1/2	2	89	1	-
Penicillium/Aspergillus group	7	311	2	-	-	-	-	-
Smuts,Periconia,Myxomycetes	4	178	1	1/5	18	800	6	-
	Debris Rating 3				Debris Rating 3			
Analytical Sensitivity	Analytical Sensitivity: 11 spr/m <sup>3</sup>				Analytical Sensitivity: 11 spr/m <sup>3</sup>			
Comments								
Total *See Footnotes	449	19956	~100%	1/1	305	13556	~100%	-

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## Footnotes and Additional Report Information

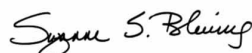
### Debris Rating Table

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 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. Analytical Sensitivity is calculated as  $\text{spr}/\text{m}^3$  divided by raw count.  $\text{spr}/\text{m}^3 = \text{raw counts} \times (100/\% \text{ read}) \times (1000/\text{Sample volume})$ . If Analytical Sensitivity is 13  $\text{spr}/\text{m}^3$  at 100% read, Analytical Sensitivity at 50% read would be 27  $\text{spr}/\text{m}^3$ , which is 2 times higher. Analytical Sensitivity provided on the report is based on an assumed 100% of the trace being analyzed.
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. The results in this report are related to this project and these samples only.
13. 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  $\text{spr}/\text{m}^3$  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  $\text{spr}/\text{m}^3$ .
14. 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

# Appendix 'D

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STATE OF NEW YORK DEPARTMENT OF LABOR  
MOLD ASSESSOR



BRIAN COLANDREA

EXPIRES: 03-20

CERT# MA01300

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