HEALTH, SAFETY & RISK MANAGEMENT
Brian Colandrea
Program Coordinator

5 BOCES Road • Poughkeepsie, NY 12601
Telephone: 845-486-8070, Facsimile: 845-486-4818
Email: brian.colandrea@dcboces.org • www.dcboces.org

Environmental Hygiene Report

Submitted to: Mr. John Willabay
Director of Facilities

Poughkeepsie City School District

Prepared by: Brian Colandrea, Safety and Risk Coordinator

Location	Morse Elementary
Project No.	031-1819
Site Visits	October 8, 2018
Report Date	October 23, 2018
Investigator	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.

TABLE OF CONTENTS

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 an indoor air quality (IAQ) investigation in multiple rooms of Morse Elementary School. On October 16 we performed a visual inspection of the rooms in question. The visual inspection revealed mold growth in Rooms 102, 204 and 215. Samples were taken in Room 102 (see **Results Summary**). Recommendations were made concerning results of the visual inspection (see **Comments & Recommendations**).

Project Scope

Perform a visual inspection of multiple rooms of the Morse Elementary School. 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. Surface samples were taken using Zefon Bio-Tape Slides. 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.

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^3*
1018-ME1	Room 102	ascospores- 400 basidiospores- 444 Chaetomium- 222 Cladosporium- 800 hyphal elements- 89 Penicillium/Aspergillus- 3556 Smuts, Periconia, Myxomycetes- 44 Stachybotrys- 44
1018-ME2	Outdoor Comparison	ascospores- 756 basidiospores- 667 Cladosporium- 89 Epicoccum- 44 hyphal elements- 89 Smuts, Periconia, Myxomycetes- 133

*spores per meter cubed

Surface Samples

Sample ID	Sample Location	Spore Identification in spr/m^3*
1018-ME3	Room 102 Boxed out area	Numerous Bispora spores seen Occasional Cladosporium spores seen Numerous Penicillium/Aspergillus group spores seen Few unknown hyphae seen
91818-PP1	Room 18 Table	Numerous Penicillium/Aspergillus group spores seen Numerous Penicillium/Aspergillus group hyphae seen Numerous Penicillium/Aspergillus group conidiophores seen

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. ***(1)*** 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 an indoor air quality (IAQ) investigation in multiple rooms of Morse Elementary School. On October 16 we performed a visual inspection of

the rooms in question. The visual inspection revealed mold growth in Rooms 102, 204 and 215. Samples were taken in Room 102 (see **Results Summary**). Room 204 had a small area of growth in a corner cabinet. Room 215 had mold growth in a vase containing water and dead plant matter. Recommendations were made concerning results of the visual inspection (see **Comments & Recommendations**).

- Room 102, remove/replace "boxed out" area and replaced with mesh/screen that allows ventilation of the area
- Room 102, clean file cabinets and instrument case (exteriors) with soapy water, then dry
- Room 102, discard old, damaged instrument case (mold growth)
- Room 204, clean area of mold growth in corner cabinet, replace water stained ceiling tile
- Room 215, remove vase containing dead plant matter (done during the investigation)

The remaining rooms inspected, Rooms 107, 203, 209, 211, 300, 306, 307, 311, 315, 319 and the Library had no visible mold growth. Several of these did have water stained ceiling tiles. The following recommendations are made concerning these.

- Room 315, replace water stained ceiling tiles, investigate if an active leak exists there.
- Library, replace water stained ceiling tiles

References

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

Appendix A

Laboratory Results

Aerobiology Laboratory Associates, Incorporated
Expertise Since 1997

Lab Use: 18039654

AZ, CA, CO, FL, GA, VA, NJ (ELITE Program) | AZ, CA, CO, VA (NVLAP) | AZ, CA, CO, FL GA, NJ, VA

Aerobiology Client	Dutchess BOCES		
Field Contact	Brian Colandrea	Collected By/Date: Brian Colandrea 10/16/18	Relinquished By/Date: Brian Colandrea 10/17/18
Reporting Address	5 BOCES Road, Poughkeepsie, NY 12601	Relinquished By/Date:	Received By/Date: S. Kelly 10/18/18
Billing Address	Same	Sampler Type: Andersen ☐ SAS ☐	SampleAire ☐ AeroTrap ☐ Other X BioCulture ☐
Phone/Fax	845-486-8087, fax # 845-486-4818	PO#/Job#:	
Reporting Email (s)	brian.colandrea@dcboces.org	Project Name: Poughkeepsie CSD, Morse Elementary	
Routine ☐ 24 Hour ☒ Same Day ☐ 4 Hour ☐ 2 Hour ☐		Notes:	
SAMPLING LOCATION ZIP CODE	12601	CC Info:	

	Sample No.	Test Code	Sample Location	Total Volume/Area
1	1018-ME1	1054	Room 102	90L
2	1018-ME2	1054	Outdoor Comparison	90L
3	1018-ME3	1051	Room 102 boxed out area	N/A
4	1018-WE4	1051	Room 102, gray file cabinet	N/A
5				
6				
7				
8				
9				
10				
11				
12				
13				
14				
15				

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	SWAB - Sewage Screen (E. coli/Entero/fecal coliforms)
1006	SWAB Culture - Bacterial Count w/ ID's	2056	WATER - 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

Washington, D.C. (877) 648-9150 | Atlanta, GA (770) 947-2828 | Denver, CO (303) 232-3746 | Phoenix, AZ (602) 441-3700 | Cherry Hill, NJ (856) 486-1177 | Los Angeles, CA (714) 895-8401 | Ft. Lauderdale, FL (954) 451-3725

Aerobiology Laboratory Associates, Incorporated
Expertise Since 1997

Certificate of Analysis
AIHA-LAP EMLAP# 102747

7184 North Park Drive
Pennsauken, New Jersey 08109
(856) 486-1177
www.aerobiology.net

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

Date Collected: 10/16/2018
Date Received: 10/18/2018
Date Analyzed: 10/18/2018
Date Reported: 10/19/2018
Project ID: 18039654

1054 Spore Trap Analysis: SOP 3.8

Client Sample Number	1018-ME1				1018-ME2			
Sample Location	ROOM 102				OUTDOOR COMPARISON			
Sample Volume (L)	90				90			
Lab Sample Number	18039654-001				18039654-002			
Spore Identification	Raw Ct	spr/m³	% Ttl	In/Out	Raw Ct	spr/m³	% Ttl	In/Out
ascospores	9	400	7	1/2	17	756	43	-
basidiospores	10	444	8	1/2	15	667	38	-
Chaetomium	5	222	4	-	-	-	-	-
Cladosporium	18	800	14	9/1	2	89	5	-
Epicoccum	-	-	-	-	1	44	2	-
hyphal elements	2	89	2	1/1	2	89	5	-
Penicillium/Aspergillus group	80	3556	63	-	-	-	-	-
Smuts,Periconia,Myxomycetes	1	44	1	1/3	3	133	8	-
Stachybotrys	1	44	1	-	-	-	-	-
	Debris Rating **3**				Debris Rating **3**			
Analytical Sensitivity	Analytical Sensitivity: **11** spr/m³				Analytical Sensitivity: **11** spr/m³			
Comments								
Total *See Footnotes	126	5600	~100%	3/1	40	1778	~100%	-

Client Sample #: 1018-ME3
Lab Sample #: 18039654-003
Sample Location: ROOM 102 BOXED OUT AREA
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7: 24hr TAT

Results:	Observation
Numerous Bispora spores seen	3-4 per field (minimum)
Occasional Cladosporium spores seen	1-5 per cover slip
Numerous Penicillium/Aspergillus group spores seen	3-4 per field (minimum)
Few Unknown hyphae seen	5 per cover slip

Debris Rating: 3

Aerobiology Laboratory Associates, Incorporated
Expertise Since 1997

Certificate of Analysis
AIHA-LAP EMLAP# 102747

7184 North Park Drive
Pennsauken, New Jersey 08109
(856) 486-1177
www.aerobiology.net

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

Date Collected: 10/16/2018
Date Received: 10/18/2018
Date Analyzed: 10/18/2018
Date Reported: 10/19/2018
Project ID: 18039654

Client Sample #: 1018-ME4
Lab Sample #: 18039654-004
Sample Location: ROOM 102, GRAY FILE CABINET
Test: 1051, Surface - Qualitative Direct Microscopic Exam SOP 3.7: 24hr TAT

Results:	Observation
Numerous Penicillium/Aspergillus group spores seen	3-4 per field (minimum)
Moderate Penicillium/Aspergillus group hyphae seen	1 per 5 fields
Moderate Penicillium/Aspergillus group conidiophores seen	1 per 5 fields

Debris Rating: 3

Aerobiology Laboratory Associates, Incorporated
Expertise Since 1997

Certificate of Analysis
AIHA-LAP EMLAP# 102747

7184 North Park Drive
Pennsauken, New Jersey 08109
(856) 486-1177
www.aerobiology.net

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

Date Collected: 10/16/2018
Date Received: 10/18/2018
Date Analyzed: 10/18/2018
Date Reported: 10/19/2018
Project ID: 18039654

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 spr/m^3 divided by raw count. spr/m^3 = raw counts x (100/ % read) x (1000/Sample volume). If Analytical Sensitivity is 13 spr/m^3 at 100% read, Analytical Sensitivity at 50% read would be 27 spr/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 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.

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 B

Inspector Credentials

STATE OF NEW YORK DEPARTMENT OF LABOR
MOLD ASSESSOR

N.Y.S

BRIAN COLANDREA

EXPIRES: 03-20

CERT# MA01300