ESI Environmental Solutions, Inc.

www.esi4u.com (410)-867-6262

Discovery Environmental Inspection Report

Project Contact Information

Alex Baylor Environmental Specialists Environmental Safety Office 13306 Old Marlboro Pike Upper Marlboro, MD 20772 301-952-6760	Apple Grove Elementary School 51,842 sq. feet	Bryan Harrington Certified Indoor Environmentalist Environmental Solutions, Inc. 6114 Drum Point Rd Deale, MD 20751 410-867-6262 Bryan@esi4u.com

Property Location

7400 Bellefield Avenue, Fort Washington, MD 20744

Date of Inspection 3/4/2019

Prepared By: Bryan Harrington

Certified Indoor Environmentalist (CIE)

Dear Mr. Baylor,

The results of the inspection and testing performed at Apple Grove Elementary School, which is located at 7400 Bellefield Avenue, Fort Washington, MD 20744, are concluded and the findings are enclosed. I want to thank you for allowing ESI the opportunity to service your indoor environmental needs. Included in this report are the observations, lab results, and recommendation from ESI's 3/4/2019 inspection and testing.

Background Information

The Prince Georges County Public School Environmental Team has taken a proactive approach in cleaning the above-mentioned school to ensure there are no health or environmental risk related to microbial and biological hazards. Historically elevated levels of humidity, condensation from pipes, periodic steam leaks and outdated HVAC systems, may have contributed to water damaged ceiling tiles and colonization of mold spores in various areas of the school.

Purpose

ESI was engaged to inspect the school in a random sufficient manner. Classrooms, administration offices, and common area building materials and contents, will be visually inspected for water damage and microbial growth.

In each location inspected, the indoor air quality will be tested for elevated levels of carbon dioxide, and carbon monoxide, in addition to measuring the relative humidity, temperature. Microbial / biological hazards within the breathable air space will also be tested.

Based upon the visible assessment, instrument readings and lab results, ESI will determine if additional remediation is necessary

Observations and instrument readings

The following table is designed for this project. Some of the fields may not be filled in due to not being applicable during the time of the inspection. You will notice either a '**YES**' or 'NO' in the table. '**YES**' indicates that mold and/or water damage was detected and 'NO' indicates it was not. If 'YES' is noted, remediation recommendations will be included for the inspected area. Please note, the cubic feet of air in the rooms inspected is an approximate number.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
Room #3	2378023	N/A	25.4%	70.4	550	005	10,075	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x2'	CMU	2	0	9	8	1	0	4
NO	NO	NO	NO	NO	NO	NO	NO	NO
Observation Notes								
• There was rust on the drop ceiling grid. There was no visible water damage on the ceiling tiles. • The indoor air quality should not pose health or environmental risk. The total spore count was 240 Count/M^3, which would be considered a normal fungal ecology.								
Recommendations								
• Monitor relative humidity during warm/humid summer months.								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
Room #13	2378035	N/A	27.6	70.4	927	007	9,120	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x2'	CMU and Partitions	4	7	3	9	1	0	4
NO	NO	NO	NO	NO	**YES**	NO	NO	NO
Observation Notes								
• There was light surface growth on the outside of the wall cabinet above the sink and tall cabinet left of the sink. • The indoor air quality should not pose health or environmental risk. The total spore count was 360 Count/M^3, which would be considered a normal fungal ecology.								
Recommendations								
• HEPA vacuum surface growth from cabinetry, then damp wipe with ShockWave or equivalent.								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
Room #19	2378022	N/A	27.4%	70.8	801	009	9,135	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4'	CMU and Partitions	0	28	5	9	1	0	4
YES	NO	NO	NO	**YES**	NO	NO	NO	NO
Observation Notes								
• There was one water damaged ceiling tile along the exterior wall. • There were discolorations on the underside of the rectangular table behind the projector stand. • The indoor air quality should not pose health or environmental risk. The total spore count was 720 Count/M^3, which would be considered a normal fungal ecology.								
Recommendations								
• Remove the water damaged ceiling tile and place in a contractor's bag for disposal. Replace ceiling tile as needed. • HEPA vacuum underside of the rectangular table behind the projector stand, then damp wipe with ShockWave or equivalent.								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
Room #28	2378041	N/A	25.0	70.3	987	009	6,791.5	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4'	CMU	1	24	3	10	0	4	2
NO	NO	NO	NO	NO	NO	NO	NO	NO
Observation Notes								
• There were accumulations of cob-webs and dust on the underside of the rectangular table along the right wall of the room. • The indoor air quality should not pose health or environmental risk. The total spore count was 240 Count/M^3, which would be considered a normal fungal ecology.								
Recommendations								
• HEPA vacuum underside of the rectangular tables along right wall, then damp wipe with ShockWave or equivalent.								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.	
Room #1	2378040	N/A	19.3	69.4	831	**010**	8,960	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x2'	CMU	1	28	3	9	2	0	4
NO	NO	NO	NO	NO	NO	NO	NO	NO
Observation Notes								
• No visible water damage or mold growth was detected in inspected area. • The carbon monoxide reading was slightly amplified. • The total spore count was 320 Count/M^3, which would be considered a normal fungal ecology.								
Recommendations								
• To reduce Carbon monoxide (CO) levels, increase air exchanges within this location.								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	CO	Cubic feet of air.
Outdoors	2378036	N/A	29.6%	42.8	390	011	N/A

Interpretation of Lab Results

In the enclosed Air Cassette Analysis report, you will notice Fungal Identification, which is the genera detected in the breathable airspace, both indoors and/or outdoors. The Raw Count is the actual number of spores counted on the slide, and the Count/M^3 are the spores per cubic meter of air. The Other particles are non-living particles such as dander, mycelial fragments, pollens, etc.

In order for humans to be exposed indoors, fungal spores, fragments, or metabolites must be released into the air and inhaled, physically contacted (dermal exposure), or ingested. Whether symptoms develop in people exposed to fungi depends on the nature of the fungal material (e.g., allergenic, toxic, or infectious), the amount of exposure, and the susceptibility of exposed persons.

Susceptibility varies with genetic predisposition (e.g., allergic reactions do not always occur in all individuals), age, state of health, and concurrent exposures.

Air Sampling Lab Results

SanAir Technologies Laboratory

Name: Environmental Solutions, Inc
Address: 534-A Deale Road
Deale, MD 20751
Phone: 410-867-6262

Project Number: 7400 Bellefield Ave.
P.O. Number:
Project Name: Apple Grove E.S.
Collected Date: 3/4/2019
Received Date: 3/5/2019 10:25:00 AM

SanAir ID Number
19009929
FINAL REPORT
3/6/2019 4:16:07 PM

Analyst: Shepperson, Josh

Air Cassette Analysis

ND = None Detected. Blank spaces indicate no spores detected.

SanAir ID Number	19009929-001			19009929-002			19009929-003			19009929-004		
Analysis Using STL	107C			107C			107C			107C		
Sample Number	2378023			2378035			2378022			2378041		
Sample Identification	Classroom #3			Classroom #13			Classroom #19			Classroom #28		
Sample Type	Air Cassette - Micro-5			Air Cassette - Micro-5			Air Cassette - Micro-5			Air Cassette - Micro-5		
Volume	25 Liters			25 Liters			25 Liters			25 Liters		
Analytical Sensitivity	40 Count/M³			40 Count/M³			40 Count/M³			40 Count/M³		
Background Density	2			2			2			2		
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Dander	69	2760	n/a	33	1320	n/a	88	3520	n/a	42	1680	n/a
Fibers	6	240	n/a	5	200	n/a	11	440	n/a	5	200	n/a
Mycelial Fragments												
Pollen												
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Aspergillus/Penicillium	1	40	17				7	280	39	3	120	50
Basidiospores	4	160	67	9	360	>99	7	280	39	1	40	17
Cladosporium species	1	40	17				2	80	11	1	40	17
Smuts/Myxomycetes							2	80	11	1	40	17
TOTAL	**6**	**240**		**9**	**360**		**18**	**720**		**6**	**240**	

Signature: Date: 3/6/2019 Reviewed: Date: 3/6/2019

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Analyst: Shepperson, Josh

Air Cassette Analysis

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SanAir ID Number	19009929-005			19009929-006				
Analysis Using STL	107C			107C				
Sample Number	2378040			2378036				
Sample Identification	Classroom #1			Outdoors				
Sample Type	Air Cassette - Micro-5			Air Cassette - Micro-5				
Volume	25 Liters			25 Liters				
Analytical Sensitivity	40 Count/M³			40 Count/M³				
Background Density	2			2				
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**		
Dander	70	2800	n/a	4	160	n/a		
Fibers	11	440	n/a					
Mycelial Fragments	2	80	n/a					
Pollen				1	40	n/a		
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**		
Aspergillus/Penicillium	1	40	13	1	40	33		
Basidiospores	3	120	38	2	80	67		
Cladosporium species	4	160	50					
Smuts/Myxomycetes								
TOTAL	**8**	**320**		**3**	**120**			

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Organism Descriptions

The descriptions of the organisms presented are derived from various reference materials. The laboratory report is based on the data derived from the samples submitted and no interpretation of the data, as to potential, or actual, health effects resulting from exposure to the numbers of organisms found, can be made by laboratory personnel. Any interpretation of the potential health effects of the presence of this organism must be made by qualified professional personnel with first hand knowledge of the sample site, and the problems associated with that site.

Dander - Comprised of human and/or animal skin cells. Counts may be higher in carpeted rooms and in rooms with more traffic.
Health Effects: May cause allergies.

Fibers - This category can include clothing, carpet, and insulation fibers.

Mycelial Fragments - A mycelium (plural = mycelia) is the "body" of a fungus. It is a collective term for hyphae (singular = hypha), which are the tubular units of the mycelium usually composed of chitin. The terms hyphae and mycelial fragments are used interchangeably. [This information was referenced from the mycology text "The Fifth Kingdom"]In some cases a fungal identification cannot be obtained due to lack of sporulation. Only the mycelial fragments are present, and cannot be identified without the distinguishing characteristics of the spores or the structures they grow from.
Health Effects: Allergic reactions may occur in the presence of spores (conidia) or mycelial/hyphal fragments.

Pollen - Produced by trees, flowers, weeds and grasses. The level of pollen production can depend on water availability, precipitation, temperature, and light. Pollen is usually dispersed by either insects or the wind.
Health Effects: Mostly effects the respiratory tract with hay fever symptoms but has also been shown to trigger asthma in some people.

Aspergillus/Penicillium - These spores are easily aerosolized. Only through the visualization of reproductive structures can the genera be distinguished. Also included in this group are the spores of the genera Acremonium, Phialophora, Verticillium, Paecilomyces, etc. Small, round spores of this group lack the necessary distinguishing characteristics when seen on non-viable examination.
Health Effects: Can cause a variety of symptoms including allergic reactions. Most symptoms occur if the individual is immunocompromised in some way (HIV, cancer, etc). Both Penicillium and Aspergillus spores share similar morphology on non-viable analysis and therefore are lumped together into the same group.

Basidiospores - From the Subphylum Basidiomycotina which contains the mushrooms, shelf fungi, and a variety of other macrofungi. They are saprophytes, ectomycorrhizal fungi or agents of wood rot, which may destroy the structure wood of buildings. It is extremely difficult to identify a specific genera of mushrooms by using standard culture plate techniques. Some basidiomycete spores can be identified by spore morphology; however, some care should be exercised with regard to specific identification. The release of basidiospores is dependant upon moisture, and they are dispersed by wind.
Health Effects: Many have the potential to produce a variety of toxins. Members of this group may trigger Type I and III fungal hypersensitivity reactions. Rarely reported as opportunistic pathogens.

Cladosporium species - The most commonly identified outdoor fungus. The outdoor numbers are reduced in the winter and are often high in the summer. Often found indoors in numbers less than outdoor numbers. It is commonly found on the surface of fiberglass duct liner in the interior of supply ducts. A wide variety of plants are food sources for this fungus. It is found on dead plants, woody plants, food, straw, soil, paint and textiles. Often found in dirty refrigerators and especially in reservoirs where condensation is collected, on moist window frames it can easily be seen covering the whole painted area with a velvety olive green layer.
Health Effects: It is a common allergen. It can cause mycosis. Common cause of extrinsic asthma (immediate-type hypersensitivity: type I). Acute symptoms include edema and bronchiospasms, chronic cases may develop pulmonary emphysema. Illnesses caused by this genus can include phaeohyphomycosis, chromoblastomycosis, hay fever and common allergies.
References: Flannigan, Brian, Robert A. Samson, and J. David Miller, eds. Microorganisms in Home and Indoor Work Environments: Diversity, Health Impacts, Investigation, and Control. London and New York: Taylor & Francis,2001.

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Smuts/Myxomycetes - Smuts and Myxomycetes are parasitic plant pathogens. They are typically grouped together due to their association with plants, the outdoors and because they share similar microscopic morphology.
Health Effects: Can produce type I fungal hypersensitivity reactions.
References: Martin, G.W., C.J. Alexopoulos, and M.L. Farr. The Genera of Myxomycetes. Iowa City, Iowa: University of Iowa Press, 1983.

Conclusions/Recommendations

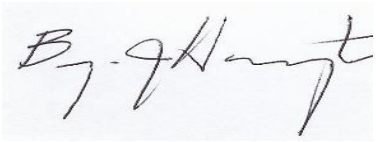
There was one water damaged ceiling tile in Room #19. In addition, rust was evident on the drop ceiling grid in Room #3. Light surface growth was discovered on the underside of the rectangular table in Room 19, as well as the cabinetry in Room #13. Recommendations for the inspected areas are outlined above.

The samples in this report indicate a normal fungal ecology for the specific test locations. The genera detected at these minimal levels should not pose environmental or exposure risks.

The Carbon monoxide level in Room #1 was slightly amplified at 010 ppm. The ASHRAE Standard, as well as the United States Green Building Council's (U.S.G.B.C.) LEED requirement for Carbon monoxide is 9 ppm or less. Please note, the outdoor level of Carbon monoxide was recorded at 011 ppm. With that said, the outdoor Carbon monoxide level may be contributing to the indoor level(s).

I hope you found our service beneficial. If you have any questions or concerns, please feel free to contact me at 410-867-6262.

Respectfully,



Bryan Harrington (CIE)
Environmental Solutions, Inc.

Industry References

Since the 1993 New York City Department of Health (NYCDOH) document (Assessment and remediation of *Stachybotrys Atra* in Indoor Environments) was produced, several other guidance documents have been written. This report was developed in accordance with and including:

- *Fungal Contamination in Buildings: A Guide to Recognition and Management* (Health Canada, 1995).
- *Control of Moisture Problems Affecting Biological Indoor Air Quality* (Flannigan and Morey, 1996).
- *Bioaerosols: Assessment and Control* (American Conference of Government Industrial Hygienists [ACGIH], 1999).
- *Guidelines on Assessment and Remediation of Fungi in Indoor Environments* (NYCDOH, 2000). [external link]
- *Mold Remediation in Schools and Commercial Buildings* (U.S. EPA, 2001).
- *Report of the Microbial Growth Task Force* (The American Industrial Hygiene Association, 2001).
- *Fungal Contamination: A manual for investigation, remediation and control (BECi) 2005*.
- *29 CFR 1910, Occupational Safety and Health Standards for General Industry, U.S. Department of Labor*
- Institute of Inspection, Cleaning and Restoration Certification Standard IICRC S520 *29 CFR 1926, Occupational Safety and Health Standards for the Construction Industry*, U.S. Department of Labor
- *40 CFR 61, National Emission Standards for Hazardous Air Pollutants (NESHAP), U.S. Environmental Protection Agency*
- *ACR 2006, Assessment, Cleaning and Restoration of HVAC Systems, National Air Duct Cleaners Association, 2006**
- *ASHRAE Standards 62.1 or 62.2*
- *ASTM D-1653, Standard Test Methods for Water Vapor Transmission of Organic Coating Films*
- *Bioaerosols: Assessment and Control,* American Conference of Governmental Industrial Hygienists, 1999
- *Field Guide for Determination of Biological Contaminants in Environmental Samples, American Industrial Hygiene Association, 2005*
- *A Guide for Mold Remediation in Schools and Commercial Buildings, US Environmental Protection Agency, 2001 Protecting the Built Environment: Cleaning for Health, Michael A. Berry Ph.D., 1993*
- *IICRC S100 Standard and Reference Guide for Professional Carpet Cleaning, Fourth Edition, Institute of Inspection, Cleaning and Restoration Certification, (S100)**
- *IICRC S300 Standard and Reference Guide for Professional Upholstery Cleaning, First Edition, Institute of Inspection, Cleaning and Restoration Certification, (S300)**
- *ANSI/IICRC S500 Standard and Reference Guide for Professional Water Damage Restoration, Third Edition, Institute of Inspection, Cleaning and Restoration Certification, (S500)**