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 alex.baylor@pgcps.org	Carmody Hills Elementary School 52,336Ft^2	Zack Butcher Certified Indoor Environmentalist Environmental Solutions, Inc. 6114 Drum Point Rd Deale, MD 20751 410-867-6262 zack@esi4u.com

Property Location

401 Jadeleaf Avenue, Capitol Heights, MD 20743

Date of Inspection: 3/25/2019

Prepared By: Zack Butcher

Certified Indoor Environmentalist (CIE)

Dear Mr. Baylor,

The results of the inspection and testing performed at Carmody Hills Elementary School 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 recommendations from ESI's 03/25/2019 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 risks 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 Historically elevated levels of humidity, condensation from pipes, periodic steam leaks and outdated HVAC systems, may have contributed to water damaged ceiling tiles and colonization of mold spores in various area of the school.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 and temperature. Microbial hazards within the breathable air space will also be tested.

Based upon the visual assessment, instrument readings, and lab results, ESI will determine if additional remediation is required.

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 area inspected.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 150	2376805	N/A	29.5%	72.5°	1,134	0.00	9,300	
Inspected								
Ceiling Tiles	Walls	Teacher s Desk	Children' s Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows/ Doors
2x4	CMU& Wallboard	1	1	7	10	1	0	1 Window 1 Door
NO	NO	NO	NO		YES	NO	N/A	NO

Observation Notes

- There was dust and debris on the convector unit.
- There was visible suspected microbial growth and evidence of water damage in the sink cabinet.
- The Carbon Dioxide (CO2) level in this room was elevated at 1,134 ppm (parts per million).
- The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 360 spores/M³ of breathable air space.

Recommendations

- To reduce Carbon Dioxide (CO2) levels, increase air exchange within this classroom. Ventilating or circulating the air with a fan will also reduce Carbon Dioxide (CO2) levels.
- HEPA vacuum, then damp-wipe the sink cabinetry with an anti-microbial agent to remove water staining and suspected microbial contamination.
- Ensure there are no active leaks from the sink.
- Clean convector unit fins with an antimicrobial to remove dust and discolorations.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 140	2376806	N/A	33.6%	71.7°	1,541	0.00	7,900	
Inspected								
Ceiling Tiles	Walls	Teacher s Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU& Wallboard	2	29	3	6	1	0	1
NO	NO	NO	NO	NO	NO	NO	N/A	NO

Observation Notes

- The Carbon Dioxide (CO2) level in this room was elevated at 1,134 ppm (parts per million).
- There were contents piled up on the convector unit, which may limit air flow.
- The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 480 spores/M³ of breathable air space.

Recommendations

- Remove contents piled up on top of the convector unit.
- To reduce Carbon Dioxide (CO2) levels, increase air exchange within this classroom. Ventilating or circulating the air with a fan will also reduce Carbon Dioxide (CO2) levels.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 135	2376807	N/A	30.6%	73.7°	1,241	0.00	7,100	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	25	3	7	0	4	2
YES	NO	NO	NO	NO	NO	N/A	YES	NO

Observation Notes

- There was dust and debris on the diffusers.
- There were two water stained ceiling tiles.
- The Carbon Dioxide (CO2) level in this room was elevated at 1,134 ppm (parts per million).
- The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 280 spores/M³ of breathable air space.

Recommendations

- Clean diffusers with an antimicrobial to remove dust and debris.
- Remove, discard, and replace the two water stained ceiling tiles.
- To reduce Carbon Dioxide (CO2) levels, increase air exchange within this classroom. Ventilating or circulating the air with a fan will also reduce Carbon Dioxide (CO2) levels.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 121	2376808	N/A	23.2%	69.8°	584	0.00	6,800	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU& Wallboard	0	0	1	5	1	0	1
NO	NO	N/A	N/A	N/A	NO	NO	N/A	NO

Observation Notes

- There was dust and debris on the convector unit.
- The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 280 spores/M³ of breathable air space.

Recommendations

- Clean convector unit fins with an antimicrobial to remove dust and discolorations.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 160	2376809	N/A	31.9%	69.2°	758	0.00	9,400	
Inspected								
Ceiling Tiles	Walls	Teacher s Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows/ Doors
2x4	CMU& Wallboard	1	5	5	7	1	0	1 Window 1 Door
YES	NO	NO	NO	NO	NO	NO	N/A	NO

Observation Notes

- There were moisture stains/rust stains on the ceiling tile grid.
- There was dust and debris on the convector unit.
- The indoor air quality should not pose health or environmental concerns, as the total fungal ecology was 840 spores/M³ of breathable air space.

Recommendations

- Clean the moisture stained ceiling tile grid to remove rust stains and discolorations.
- Clean convector unit fins with an antimicrobial to remove dust and debris.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.
Control-Outside	2376804		22.5%	72.6°			

- The total fungal ecology detected in the outdoor control sample was 360 spores/M³ of breathable air space.

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 inside, and outside. The Raw count is the actual number of spores counted on the slide, and the Count/m3 are the spores per cubic meter of air. The other particles are non-living particles such as dander, mycelial fragments, pollens, etc.

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: 401 Jadeleaf Avenue
P.O. Number: JZB
Project Name: Carmody Hills Elementary School
Collected Date: 3/25/2019
Received Date: 3/27/2019 9:35:00 AM

SanAir ID Number
19014162
FINAL REPORT
3/27/2019 4:46:46 PM

Analyst: Smith, Kiersten

Air Cassette Analysis

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

SanAir ID Number	19014162-001			19014162-002			19014162-003			19014162-004		
Analysis Using STL	107C			107C			107C			107C		
Sample Number	2376804			2376805			2376806			2376807		
Sample Identification	Control - Outside			Room 150			Room 140			Room 135		
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+			1+		
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Dander	2	80	n/a	106	4240	n/a	130	5200	n/a	87	3480	n/a
Fibers	1	40	n/a	3	120	n/a	5	200	n/a	3	120	n/a
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Ascospores							1	40	8	1	40	14
Aspergillus/Penicillium							4	160	33			
Basidiospores	9	360	>99	5	200	56	7	280	58			
Cladosporium species				4	160	44				5	200	71
Smuts/Myxomycetes										1	40	14
TOTAL	**9**	**360**		**9**	**360**		**12**	**480**		**7**	**280**	

Signature: K. Smith Date: 3/27/2019 Reviewed: Johnathan Wilson Date: 3/27/2019

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Analyst: Smith, Kiersten

Air Cassette Analysis

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

SanAir ID Number	19014162-005			19014162-006		
Analysis Using STL	107C			107C		
Sample Number	2376808			2376809		
Sample Identification	Room 121			Room 160		
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	55	2200	n/a	55	2200	n/a
Fibers	5	200	n/a			
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Ascospores	2	80	29	4	160	19
Aspergillus/Penicillium	2	80	29	9	360	43
Basidiospores	2	80	29	8	320	38
Cladosporium species	1	40	14			
Smuts/Myxomycetes						
TOTAL	**7**	**280**		**21**	**840**	

Signature: K. Smith Date: 3/27/2019 Reviewed: Johnathan Wilson Date: 3/27/2019

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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.

Ascospores - From the fungal Subphylum Ascomycotina. Ascospores are ubiquitous in nature and are commonly found in the outdoor environment. This class contains the "sac fungi" and yeasts. Some ascospores can be identified by spore morphology, however; some care should be excercised with regard to specific identification. They are identified on tape lifts and non-viable analysis by the fact that they have no attachment scars and are sometimes enclosed in sheaths with or without sacs. Ascomycetes may develop both sexual and asexual stages. Rain and high humidity may help asci to release, and dispurse ascospores, which is why during these weather conditions there is a great increase in counts.
Health Effects: This group contains possible allergens.

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

The samples in this report do not indicate elevated concentrations of aerosolized mold spores detected in the breathable air space of the test locations.

Although there were no elevated concentrations of aerosolized mold spores in the breathable air space of the test locations, several rooms still need attention. This is mainly due to water stained ceiling tiles, dust and debris on convector units or diffusers, water damage in sink cabinets, and slightly elevated levels of CO2. Please refer to all the recommendations listed above.

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,

Zack Butcher (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)**