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 alex.baylor@pgcps.org	Francis Scott Key Elementary School 2301 Scott Key Drive District Heights, MD 20747 86,814 Ft^2	Zack Butcher Certified Indoor Environmentalist Environmental Solutions, Inc. 6114 Drum Point Rd Deale, MD 20751 410-867-6262 Zack@esi4u.com

Property Location

2301 Scott Key Drive, District Heights, MD 20747

Date of Inspection: 2/25/2019

Prepared By: Zack Butcher

Certified Indoor Environmentalist (CIE)

Dear Mr. Baylor,

The results of the inspection and testing performed at Francis Scott Key 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 02/25/2019 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 Historically elevated levels of humidity, condensation from pipes, periodic steam leaks and outdated HVAC systems, may have contributed to water damage ceiling tiles and colonization of mold spores in various area of the school.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 evidence of 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/biological 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 in 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 recommendation will be included for the area inspected.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 133	2367387	N/A	35.7%	63.8°	761	0.00	9,300	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	2	15	2	3	1	N/A	3
YES	NO	NO	NO	NO	NO	YES	N/A	NO

Observation Notes

- There were three water stained ceiling tiles.
- The convector unit fins had some dust, debris, and suspected microbial growth on them.
- The indoor air quality should not pose health or environmental risks, as the total spore count was 40 spores/M³ of breathable air space.

Recommendations

- Remove, discard, and replace the three water stained ceiling tiles.
- HEPA vacuum the convector unit fins, then damp wipe them with an antimicrobial agent.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 138	2367388	N/A	16%	69.9°	588	0.00	6,200	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	2	N/A	4	5	1	N/A	4
NO	NO	NO	N/A	NO	NO	NO	N/A	NO

Observation Notes

- There were NO signs of visible suspected microbial growth or elevated moisture content levels detected in this location.
- The remediation efforts were completed successfully, and the indoor air quality should not pose health or environmental risks, as the total spore count was 800 spores/M³ of breathable air space.

Recommendations

NONE

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 140	2367389	N/A	27.4%	67.4°	858	0.00	9,500	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	2	4	5	3	2	N/A	4
YES	NO	NO	NO	NO	NO	YES	N/A	NO

Observation Notes

- There were five water stained ceiling tiles.
- There was dust, debris, and suspected microbial growth on the convector unit fins. In addition, there were rust stains at the bottom of the convector unit.
- The indoor air quality should not pose health or environmental risks, as the total spore count was 80 spores/M³ of breathable air space.

Recommendations

- Remove, discard, and replace the five water stained ceiling tiles.
- HEPA vacuum the convector unit fins, then damp wipe them with an antimicrobial agent.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 123	2367390	N/A	16.2%	69.4°	734	0.00	9,700	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	1	7	2	1	N/A	1
NO	NO	NO	NO	NO	NO	YES	NO	NO

Inspected

- There was dust, debris, and suspected microbial growth on the convector unit fins.
- The indoor air quality should not pose health or environmental risks, as the total spore count was 40 spores/M³ of breathable air space.

Recommendations

- HEPA vacuum the convector unit fins, then damp wipe them with an antimicrobial agent.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 121	2367391	N/A	27.1%	69.0°	1,241	0.00	8,500	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	3	9	4	1	N/A	3
NO	NO	NO	NO	NO	NO	NO	NO	NO
Observation Notes								
• There were NO signs of visible suspected microbial growth or elevated moisture content levels detected in this location. • The Carbon Dioxide (CO2) level in this room was slightly elevated at 1,241 ppm (parts per million). • The remediation efforts were completed successfully, and the indoor air quality should not pose health or environmental risks, as the total spore count was 120 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.								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 117	2367392	N/A	10.8%	73.4°	649	0.00	8,500	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	N/A	12	1	4	1	N/A	3
NO	NO	N/A	NO	NO	NO	YES	N/A	NO
Observation Notes								
• There was minimal visible suspected microbial growth on the convector unit fins. • The indoor air quality should not pose health or environmental risks, as the total spore count was 1,000 spores/M³ of breathable air space.								
Recommendations								
• HEPA vacuum and damp wipe the convector unit fins.								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 108	2367393	N/A	24.7%	71.7°	980	0.00	11,500	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	0	12	3	1	N/A	3
NO	NO	NO	NO	NO	NO	NO	N/A	NO
Observation Notes								
• There were NO signs of visible suspected microbial growth or elevated moisture content levels detected in this location. • The remediation efforts were completed successfully, and the indoor air quality should not pose health or environmental risks, as the total spore count was 120 spores/M³ of breathable air space.								
Recommendations								
NONE								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 102	2367394	N/A	17.3%	71.2°	681	0.00	8,500	
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
2x4	CMU	1	25	4	4	1	N/A	3
NO	NO	NO	NO	NO	NO	NO	N/A	NO
Observation Notes								
• There were NO signs of visible suspected microbial growth or elevated moisture content levels detected in this location. • The remediation efforts were completed successfully, and the indoor air quality should not pose health or environmental risks, as the total spore count was 200 spores/M³ of breathable air space.								
Recommendations								
NONE								

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: 2301 Amended 2.27.19
P.O. Number: JZB
Project Name: Francis Scott Key Elementary School
Collected Date: 2/25/2019
Received Date: 2/26/2019 9:40:00 AM

SanAir ID Number
19008726
FINAL REPORT
2/27/2019 4:28:50 PM

Analyst: Shepperson, Josh

Air Cassette Analysis

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

SanAir ID Number	19008726-001			19008726-002			19008726-003			19008726-004		
Analysis Using STL	107C			107C			107C			107C		
Sample Number	2367387			2367388			2367389			2367390		
Sample Identification	Room 133			Room 138			Room 140			Room 123		
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	1+			1+			1+			1+		
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Dander	11	440	n/a	5	200	n/a	26	1040	n/a	18	720	n/a
Fibers	2	80	n/a				1	40	n/a	2	80	n/a
Pollen												
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Aspergillus/Penicillium				4	160	20	2	80	>99			
Basidiospores										1	40	>99
Cladosporium species	1	40	>99	16	640	80						
Smuts/Myxomycetes												
TOTAL	**1**	**40**		**20**	**800**		**2**	**80**		**1**	**40**	

Signature: Date: 2/26/2019 Reviewed: Date: 2/26/2019

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2/27/2019 4:28:50 PM

Analyst: Shepperson, Josh

Air Cassette Analysis

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

SanAir ID Number	19008726-005			19008726-006			19008726-007			19008726-008		
Analysis Using STL	107C			107C			107C			107C		
Sample Number	2367391			2367392			2367393			2367394		
Sample Identification	Room 121			Room 117			Room 107			Room 102		
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	1+			1+			2			2		
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Dander	18	720	n/a	8	320	n/a	25	1000	n/a	29	1160	n/a
Fibers	1	40	n/a	1	40	n/a	1	40	n/a	6	240	n/a
Pollen												
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Aspergillus/Penicillium	1	40	33	11	440	44				4	160	80
Basidiospores	2	80	67									
Cladosporium species				14	560	56	3	120	>99			
Smuts/Myxomycetes										1	40	20
TOTAL	**3**	**120**		**25**	**1000**		**3**	**120**		**5**	**200**	

Signature: Date: 2/26/2019 Reviewed: Date: 2/26/2019

Property Location: 2301 Scott Key Drive,
District Heights, MD 20747

Date of Inspection: 2/25/019

SanAir Technologies Laboratory

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Address: 534-A Deale Road
Deale, MD 20751
Phone: 410-867-6262

Project Number: 2301 Amended 2.27.19
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Project Name: Francis Scott Key Elementary School
Collected Date: 2/25/2019
Received Date: 2/26/2019 9:40:00 AM

SanAir ID Number
19008726
FINAL REPORT
2/27/2019 4:28:50 PM

Analyst: Shepperson, Josh

Air Cassette Analysis

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

SanAir ID Number	19008726-009		
Analysis Using STL	107C		
Sample Number	2367395		
Sample Identification	Control - Outside		
Sample Type	Air Cassette - Micro-5		
Volume	25 Liters		
Analytical Sensitivity	40 Count/M^3		
Background Density	1+		
Other	**Raw Count**	**Count/M^3**	**%**
Dander	1	40	n/a
Fibers			
Pollen	1	40	n/a
Fungal Identification	**Raw Count**	**Count/M^3**	**%**
Aspergillus/Penicillium	2	80	67
Basidiospores	1	40	33
Cladosporium species			
Smuts/Myxomycetes			
TOTAL	**3**	**120**	

Signature: Date: 2/26/2019 Reviewed: Date: 2/26/2019

Property Location: 2301 Scott Key Drive,
District Heights, MD 20747

Date of Inspection: 2/25/019

SanAir Technologies Laboratory

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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.

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.

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 indicate a normal fungal ecology for the specific locations tested. Based on the visual inspection and lab results, there are no health or environmental risks related to the remediated areas of the school. Please refer to the attached lab results for identification and spore count per location.

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)**