ESI Environmental Solutions, Inc.

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

Discovery Environmental Inspection Report

Project Contact Information

Concord Elementary School 2004 Concord Lane District Heights, MD 20747 43,984 sq. ft.	Alex Baylor Environmental Specialists Environmental Safety Office 13306 Old Marlboro Pike Upper Marlboro, MD 20772 Office Number: 301-952-6760	Vinny Gigliotti Environmental Solutions Inc. (410) 867-6262 vinny@esi4u.com

Property Location

2004 Concord Lane, District Heights, MD 20747

Date of Inspection 2/13/2019

Prepared By: Vinny Gigliotti

Certified Indoor Environmentalist (CIE)

Dear Mr. Baylor,

The results of the inspection and testing performed at Concord 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 recommendation from ESI's February 13, 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 Historically elevated levels of humidity, condensation from pipes, periodic steam leaks and outdated HVAC systems, may have contributed to water damage ceiling tiles and colonization of mold spores in various area of the school.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, as well as contents, were visually inspected for water damage and microbial growth.

In each location inspected, the indoor air quality was 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, the following rooms will need additional remediation services.

- Cafeteria
- Room 109
- Media center
- Room 105

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 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.**	
Cafeteria	237-4455		45	66	580	001		
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
NO	NO	NO	N/A	YES	NO	NO	NO	NO
Observation Notes								
• The cafeteria/multi-purpose room had visible microbial growth colonizing underneath and on the sides of the tables. • The other contents in this room did not have any signs of mold growth or water intrusion. • The HVAC registers had an accumulation of dust and debris, but no visible signs of colonizing mold spores. • Although there was visible mold growth under the table, there were no elevated levels of mold spores in the breathable air space. The total accumulation of mold spores in the air was only 160 spores per cubic meter of air.								
Recommendations								
• HEPA vacuum, spray antimicrobial, then damp wipe microbial growth from the tables.								

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 109	237-4451	YES	33	77	564	001		
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
NO	NO	YES	NO	YES	YES	YES	NO	NO

Observation Notes

- This classroom is contaminated with visible mold growth under the tables, inside the convector and on the carpet.
- The indoor air quality has elevated levels of mold spores which may pose heath and environmental risk.
- The total spores count was 10, 040 spore per cubic meter of air. Aspergillus/Penicillium was 9,040 and Cladosporium was detected at 1,000 spore per cubic meter of air.
- The swab culture collected from the convector in the classroom indicated heavy amounts of Cladosporium was detected, which was also detected in the breathable air space.

Recommendations

- Anyone entering this room should don full personal protection.
- I highly recommend this classroom be isolated from the common areas of the school and placed under negative air pressure.
- Remediation of this room should be followed within the methodical process below.
    1. Fogg the entire classroom with an antimicrobial.
    2. HEPA vacuum ceiling to floor and wall to wall all surfaces and contents.
    3. Have all the computers placed in sealed plastic bags and relocated offsite to be decontaminated or discarded. The fans inside the computers may cross contaminate places or persons.
    4. Have the convector filters discarded and the convector completely decontaminated with an antimicrobial solution.
    5. All the contents that are salvageable should be relocated offsite and decontaminated.
    6. Once the classroom is remediated, the indoor air quality should be re-tested as well as the contents inspected and tested.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Media Center	237-4452		40	73	557	001		
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	Carpet	Windows
YES	NO	NO	NO	YES	NO	NO	YES	NO

Observation Notes

- The ceiling tiles have water stains
- There were visible mold spores under the computer desk
- The convector fins had an accumulation of dust and debris and they were very rusty, indicating elevated levels of condensation were preexisting.
- This room had a musty odor during the inspection.
- Although there was visible mold growth under the table, there were no elevated levels of mold spores in the breathable air space. The total accumulation of mold spores in the air was only 320 spores per cubic meter of air.

Recommendations

- Damp wipe visible mold spores from the computer desk.
- HEPA vacuum and/or steam clean the carpet
- Replace convector filter
- HEPA vacuum and damp wipe the convector fins.

Location	IAQ Sample #	Swab	R/H	Temp	CO2	Co	Cubic feet of air.	
Room 105	237-4453		43	75	1084	001		
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
NO	NO	NO	NO	YES	NO	NO		NO

Observation Notes

- This classroom was relatively clean with minimal amounts of surface mold under one of the computer desks.
- Although there was visible mold growth under the one of the tables, there were no elevated levels of mold spores within the breathable air space. The total accumulation of mold spores in the air was only 920 spores per cubic meter of air.
- The Carbon Dioxide CO2 level in this room was slightly elevated at 1084.

Recommendations

- HEPA vacuum, spray antimicrobial, then damp wipe microbial growth from the tables.
- 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 102	237-4454		34	76	817	001		
Inspected								
Ceiling Tiles	Walls	Teachers Desk	Children's Desk	Tables	Cabinets Shelving	Convector	HVAC Diffusors	Windows
NO	NO	NO	NO	NO	NO	NO		NO
Observation Notes								
There were no signs of water damage on the ceiling tiles or visible microbial growth on any of the exposed surfaces in this classroom. There were no elevated levels of mold spores in the breathable air space. The total accumulation of mold spores in the air was only 80 spores per cubic meter of air.								
Recommendations								

Interpretation of Lab Results

In the enclosed Air Cassette Analysis report, you will notice Fungal Identification, which is the species 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…

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: 2004
P.O. Number: VJG
Project Name: Concord ES
Collected Date: 2/13/2019
Received Date: 2/15/2019 10:30:00 AM

SanAir ID Number
19006923
FINAL REPORT
2/15/2019 4:49:39 PM

Analyst: Zhang, Ph.D, Richard

Air Cassette Analysis

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

SanAir ID Number	19006923-001			19006923-002			19006923-003			19006923-004		
Analysis Using STL	107C			107C			107C			107C		
Sample Number	237-4455			237-4451			237-4452			237-4453		
Sample Identification	Cafateria			Room 109			Media Center			Rom 105		
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+			2		
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Dander	35	1400	n/a	48	1920	n/a	92	3680	n/a	108	4320	n/a
Fibers	1	40	n/a	1	40	n/a	1	40	n/a	6	240	n/a
Mycelial Fragments										1	40	n/a
Pollen							1	40	n/a			
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**
Aspergillus/Penicillium	1	40	25	226	9040	90	6	240	75	12	480	52
Basidiospores	2	80	50				1	40	13			
Cladosporium species	1	40	25	25	1000	10	1	40	13	11	440	48
TOTAL	**4**	**160**		**251**	**10040**		**8**	**320**		**23**	**920**	

Signature: Date: 2/15/2019 Reviewed: Date: 2/15/2019

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Analyst: Zhang, Ph.D, Richard

Air Cassette Analysis

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SanAir ID Number	19006923-005			19006923-006				
Analysis Using STL	107C			107C				
Sample Number	237-4454			237-4450				
Sample Identification	Room 102			Outside Control				
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			1+				
Other	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**		
Dander	142	5680	n/a	8	320	n/a		
Fibers	2	80	n/a	1	40	n/a		
Mycelial Fragments								
Pollen								
Fungal Identification	**Raw Count**	**Count/M³**	**%**	**Raw Count**	**Count/M³**	**%**		
Aspergillus/Penicillium								
Basidiospores	2	80	>99	14	560	>99		
Cladosporium species								
TOTAL	**2**	**80**		**14**	**560**			

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Analyst: Zhang, Ph.D, Richard

Direct Identification Analysis

SanAir ID: 19006923-007 Sample #:Swab Room 109 Conveter

D1 - Direct Identification Analysis on Surface Swab using STL 104

Direct ID of Mold

Fungi	Estimated Amount
Bipolaris/Drechslera	Rare
Cladosporium species	Heavy
Pithomyces species	Rare

Estimated Amount	Indication of Growth	Evidence of Mycelial Fragments/Conidiophores
Rare	Not Likely	None
Light	Possible	Some, 10 to 25% of Tape Covered
Moderate	Probable	Abundant, 25 to 50% of Tape Covered
Heavy	Significant	Throughout, 50 to 100% of Tape Covered

*Refer to additional information page for further details

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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.

Bipolaris/Drechslera - Found on grasses, grains, various plants, and decaying food. May grow in semi-dry environments. Some species are found in indoor environments. Because of the microscopic similarities between the two genera, they are grouped together on non-viable analyses.
Health Effects: Can occasionally cause corneal infection of the eye. This group of fungi constitutes the most commonly reported causes of allergic fungal sinusitis. They produce type I fungal hypersensitivity in humans.
References: St-Germain, Guy, and Richard Summerbell. Identifying Filamentous Fungi: A Clinical Laboratory Handbook. California: Star Publishing Co., 1996.

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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.

Pithomyces species - Grows on dead grass in pastures and decaying plant material.
Health Effects: Causes facial eczema in ruminants.
References: St-Germain, Guy, and Richard Summerbell. Identifying Filamentous Fungi: A Clinical Laboratory Handbook. California: Star Publishing Co., 1996.

Conclusions/Recommendations

This school was not properly remediated prior to ESI's inspection and testing. I believe the custodial staff may not have understood the remediation procedure necessary to maintain proper hygiene to reduce the cause and effects of mold spores colonizing.

Based upon my interaction with the onsite custodial staff, I believe they have good intentions of maintaining a clean and healthy environment for all the occupants of the school. They simply didn't understand the contributing factors, growth patterns or decontamination methods for mold growth. Once properly trained, I believe the schools hygiene will improve.

To maintain the proper hygiene needed within the PGCPS system, students, teachers, administrators and custodial staff should assist each other in attaining this goal.

I hope you found our service beneficial. If you have any questions or concerns, please feel free to contact me at 301-509-0010 which my cell phone and or call my office at 410-867-6262.

Respectfully,

Vinny Gigliotti (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)**