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MICROBIAL INVESTIGATION REPORT

Performed At:

Clinton Middle School
34 Grayrock Road
Clinton, NJ 08809

Performed For:

Clinton Township Schools
P.O. Box 6
Annandale, NJ 08801

Prepared By:

LEW Corporation
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Date of Inspection: 8/31/2018 &
9/8/2018

Project Number: 181023

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CONTACT INFORMATION

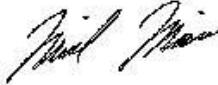
Site:

Name	Clinton Middle School
Street Address:	34 Grayrock Road Clinton, NJ 08809
Date Inspected	9/8/2018

Owner:

Name:	Clinton Township Schools
Street:	P.O. Box 6 Annandale, NJ 08801
Phone Number:	(908) 236-7235

Microbial Consultant:

Consultant Name:	Michael Mosier
Signature:	
Date:	September 13th, 2018
Email:	mmosier@lewcorp.com

Consultant Information:

Organization:	LEW Corporation
Street:	181 US Hwy 46
City, State & Zip:	Mine Hill, NJ 07803
Phone number:	908-654-8068
Web address:	www.LEWCorp.com

Laboratory Information:

Organization:	Environmental Hazards Services, LLC
Street:	7469 White Pine Rd.
City, State & Zip:	Richmond, VA 23237
Phone number:	800-347-4010
AIHA Lab ID #:	100420

INTRODUCTION TO FUNGI

Background Information About Fungi

Fungi can be found almost anywhere; they can grow on virtually any organic substance, as long as moisture and oxygen are present. There are fungi that can grow on wood, paper, carpet, foods, and insulation. When excessive moisture accumulates in buildings or on building materials, fungal growth will often occur, particularly if the moisture problem remains undiscovered or unaddressed. It is impossible to eliminate all fungi and fungal spores in the indoor environment. However, fungi growth can be controlled indoors by controlling moisture indoors.

Fungi reproduce by making spores that usually cannot be seen without magnification. Spores waft through the indoor and outdoor air continually. When fungal spores land on a damp spot indoors, they may begin growing and digesting whatever they are growing on in order to survive. Fungi gradually destroy the things they grow on. Many types of fungi exist. All fungi have the potential to cause health effects. Fungi can produce allergens that can trigger allergic reactions or even asthma attacks in people allergic to fungi. Some species of fungi are known to produce potent toxins and/or irritants. Potential health concerns are an important reason to prevent fungal growth and to remediate/clean up any existing indoor fungal growth.

Since fungi require water to grow, it is important to prevent moisture problems in buildings. Moisture problems can have many causes, including uncontrolled humidity. Some moisture problems in buildings have been linked to changes in building construction practices during the 1970s, 80s, and 90s. Some of these changes have resulted in buildings that are tightly sealed, but may lack adequate ventilation, potentially leading to moisture buildup. Building materials, such as drywall, may not allow moisture to escape easily. Moisture problems may include roof leaks, landscaping or gutters that direct water into or under the building, and poorly vented combustion appliances. Delayed maintenance or insufficient maintenance is also associated with moisture problems.

When fungal growth occurs in buildings, some building occupants, particularly those with allergies or respiratory problems, may report adverse health problems. Remediaters should avoid exposing themselves and others to fungal-laden dusts as they conduct their cleanup activities. Caution should be used to prevent fungi and fungal spores from being dispersed throughout the air where building occupants can inhale them.

Fungi Prevention Tips

- Fix leaky plumbing and leaks in the building envelope as soon as possible.
- Watch for condensation and wet spots. Fix source(s) of moisture problem(s) as soon as possible.

- Prevent moisture due to condensation by increasing surface temperature or reducing the moisture level in air (humidity). To increase surface temperature, insulate or increase air circulation. To reduce the moisture level in air, repair leaks, increase ventilation (if outside air is cold and dry), or dehumidify (if outdoor air is warm and humid).
- Keep heating, ventilation, and air conditioning (HVAC) drip pans clean, flowing properly, and unobstructed.
- Vent moisture-generating appliances, such as dryers, to the outside where possible.
- Maintain low indoor humidity, below 60% relative humidity (RH), ideally 30-50%, if possible.
- Perform regular building/HVAC inspections and maintenance as scheduled.
- Clean and dry wet or damp spots within 24 - 48 hours.
- Don't let foundations stay wet. Provide drainage and slope the ground away from the foundation.

SCOPE OF WORK

LEW Corporation performed an investigation at Clinton Middle School, 34 Grayrock Road, Clinton, NJ 08809 to determine the presence or absence of mold growth and the level of concern. Specifically, LEW Corporation investigated room 158B, the connected computer room, studio A159, room 158B storage room and room C118. The investigation included a visual survey, interview with knowledgeable parties, and sampling as necessary. The visual survey did not include inspecting every surface of every content in each area but was rather a general survey with a random selection of objects being inspected. Measurements collected included air temperature, and relative humidity. Samples collected included spore trap air sampling. LEW Corporation will have the samples analyzed and based on all the data collected provide a written report discussing the results and recommendations.

PROCEDURES

General

The inspection protocols were based on the guidelines of the EPA "Building Air Quality Guide for Building Owners and Facility Managers", ISBN-0-16-035919-8, published in December 1991, *Bioaerosols: Assessment and Control*, published by the American Conference of Governmental Industrial Hygienists in 1999 and Recognition, Evaluation and Control of Indoor Mold, published by the American Industrial Hygiene Association in 2008. These guides describe a process of building inspection and evaluation, information exchange and problem solving to enhance occupant health, comfort and productivity. The process involves the assessment of numerous air quality issues, including thermal comfort, emission sources, biological contamination, fresh air ventilation, and energy management.

Surface Fungi

One method of testing of surfaces for fungi is conducted with the use of Fisherbrand Transport Swabs, manufactured by Fisher Healthcare in Houston, Texas. The swabs are wetted with a nutrient solution held by the transport sponge, wiped over a surface area of approximately one square inch, and transported to the laboratory sealed against the sponge. In the laboratory, the solution is plated onto agar media for fungi. Viable colonies are quantified and identified to the genus level for fungal isolates and speciated when possible. The concentrations of surface swabs are reported in units of colony-forming units per swab (CFU/swab). The laboratory can also analyze the swab using direct microscopic examination. Spores and other particles are quantified and identified to only the genus level.

Tape lift sampling is another method of collecting surface samples. A piece of clear adhesive tape is laid over the sample area. The tape is then removed and placed on either a glass slide or clear plastic slide lockable bag. In the laboratory, the tape is analyzed using direct microscopic examination. Spores and other particles are quantified and identified to the genus level. Tape lift samples cannot be cultured therefore identification can only be made to the genus level.

Airborne Fungi

Air sampling for non-viable fungi (spores) is conducted with Air-O-Cell cassettes manufactured by Zefon Analytical Accessories of Ocala, Florida. These cassettes are also known as spore traps. A high-volume sampling pump is connected to the cassette and at least fifteen liters of air per minute are pulled through the cassette. The sampling time varies from two minutes to ten minutes depending upon the site conditions and the investigator's best judgment. The goal is to not overload the cassette.

INSPECTION

August 31st, 2018

LEW Corporation was requested to perform an inspection and air sampling of Room 158B, the computer room, Studio A159, Room 158B Storage room, and Room C118. Mr. Dan Gorman reported that a teacher's bag, stored in the teacher's desk in room 158B, had contained mold on it. No mold growth was observed in the drawers or surface of the teacher's desk or any of the surrounding surfaces upon inspection in 158B's main classroom.

Room 158B Main Classroom

No suspect mold growth was observed on the teachers' desk in room 158B, in any of the drawers, and throughout the main room. Relative humidity of the space was 75.3% and temperature was 74.1°F.

A spore trap air sample was collected from breathing height near the teacher's desk (181023-1). The laboratory results of the air sample did not indicate a presence of elevated spore levels.

Room 158B Computer Room

No suspect mold growth was observed in the computer room. Relative humidity of the space was 76.5% and temperature was 74.1°F.

A spore trap air sample was collected from breathing height in the middle of the computer room (181023-2). The laboratory results of the air did not indicate a presence of elevated spore levels.

Studio A159

No suspect mold growth was observed in studio A159. Relative humidity of the space was 77.5% and temperature was 73.8°F.

A spore trap air sample was collected from breathing height in the middle of studio 159A (181023-3). The laboratory results of the air sample did not indicate a presence of elevated spore levels.

Room 158B Storage Room

No suspect mold growth was observed in the storage room. Relative humidity of the space was 77.5% and temperature was 73.9°.

A spore trap air sample was collected from breathing height in the middle of the storage room (181023-4). The laboratory results of the air sample indicated the presence of elevated concentrations *Aspergillus/Penicillium* spores.

Room C118

No suspect mold growth was observed in room C118. Relative humidity of the space was 74.9% and temperature was 74.3°F.

A spore trap air sample was collected from breathing height in the middle of room C118 (181023-5). The laboratory results of the air sample did not indicate a presence of elevated spore levels.

September 8th, 2018

LEW Corporation was requested to perform an inspection and air sampling of Room 158B, and 158B Storage room following a previous inspection of the space on August 31st, 2018. No mold growth was observed in the drawers or surface of the teacher's desk or any of the surrounding surfaces upon inspection in 158B's main classroom and 158B Storage room.

158B Main Classroom

No suspect mold growth was observed in 158B main classroom. Relative humidity of the space was 72.6% and temperature was 73.9 °F.

A spore trap air sample was collected from breathing height in the middle of room 158B (181023-1). The laboratory results of the air sample did not indicate a presence of elevated spore levels.

158B Storage Room

No suspect mold growth was observed in 158B storage room. Relative humidity of the space was 72.2% and temperature was 74.8 °F.

A spore trap air sample was collected from breathing height in the middle of room 158B Storage room (181023-2). The laboratory results of the air sample did not indicate a presence of elevated spore levels.

DISCUSSION AND RECOMMENDATIONS

It is not possible to conclude with absolute assurance that fungi/mold germination is caused by a specific condition, without extensive testing and evaluation. It is possible, however, to identify conditions that are likely to result in biological amplification, based on visual inspection and problem solving. This approach was used in this investigation.

Room 158B, Computer Room, Studio A159

No suspect mold growth was observed in the main room of 158B, the computer room, and studio A159.

Based on the findings and laboratory results, it is LEW Corporations opinion that any suspected mold growth was not impacting these areas at the time of the investigation and remediation is not necessary.

Room 158 B Storage Room

No suspect mold growth was observed in the storage room of 158B. A humidity reading was taken at 77.5%. Based on the information provided and readings collected, LEW Corporation believes that elevated counts on sample 181023-4 could be an indication of elevated humidity in the space.

LEW Corporation recommends a thorough cleaning of the storage room and maintain indoor relative humidity levels between 30% and 60% based on EPA recommendations.

Room C118

No suspect mold growth was observed in room C118.

Based on these findings, it is LEW Corporations opinion that mold growth was not impacting these areas at the time of the investigation and remediation is not necessary.

September 8th, 2018

Room 158B Main Room

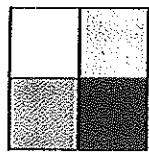
No suspect mold growth was observed in room 158B.

A humidity reading was taken at 72.6%. Based on the findings and laboratory results, it is LEW Corporations opinion that any suspected mold growth was not impacting these areas at the time of the investigation and remediation is not necessary. An attributing factor that could potentially be related to a fluctuation of mold spores in the space could be due to the elevated relative humidity.

Room 158B Storage Room

No suspect mold growth was observed in the storage room of 158B.

A humidity reading was taken at 72.2%. Based on the findings and laboratory results, it is LEW Corporations opinion that any suspected mold growth was not impacting these areas at the time of the investigation unlike the previous investigation on August 31st, 2018. A possible contributing factor could be associated to the elevated relative humidity level and lack of ventilation within the space.



LEW
Corporation

"The Environmental Company"

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Site: CLINTON MIDDLE School

APPENDIX A

Laboratory Results



Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.

7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

Report Number: 18-09-00924

Received Date: 9/10/2018
Analyzed Date: 09/10/2018
Reported Date: 09/10/2018

Client: LEW Corp
181 US Hwy 46
Mine Hill, NJ 07803

Project/Test Address: Clinton Middle School; 34 Grayrock Road; Clinton, NJ

Client Number:

201327

Fax Number:

Ext 18

Laboratory Results

Lab #:	18-09-00924-003	18-09-00924-001	18-09-00924-002				
Client Sample ID :	181023-3	181023-1	181023-2				
Date Collected :	9/8/2018	9/8/2018	9/8/2018				
Collection Location :	OUTSIDE	158B MAIN CLASSROOM	158B STORAGE ROOM				
Sampling Media :	Air-O-Cell	Air-O-Cell	Air-O-Cell				
Analytical Sensitivity (spores/m3) :	13.3	13.3	13.3				
Volume (L) :	75	75	75				
Spore ID	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)	Raw Count
Cladosporium spores	264	3500	3	40			
Peronospora/Oidium spores	4	53					
Penicillium/Aspergillus group spores	313	4200			59	790	
Alternaria spores	3	40					
Aureobasidium spores	1	13					
Drechslera/Bipolaris group spores	1	13					
Curvularia spores	9	120					
Torula spores	6	80					
Chaetomium spores	1	13					
Pithomyces spores	15	200					
Epicoccum spores	1	13					
Cercospora spores	1	13					
Nigrospora spores	2	27					
Fusarium spores	1	13					
Spegazzinia spores	1	13					
smuts, Periconia, myxomycetes	108	1400					

Environmental Hazards Services, L.L.C

Client Number: 201327

Report Number: 18-09-00924

Project/Test Address: Clinton Middle School; 34 Grayrock Road; Clinton, NJ

Lab #:	18-09-00924-003		18-09-00924-001		18-09-00924-002					
Spore ID	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)	Raw Count	Results (Spores/m3)
ascospores	202	2700								
basidiospores	127	1700								

TOTAL SPORES(Spores/m3)

14000

40

790

Analyst:

Laura S. Carson

Laura S. Carson

Laura S. Carson

Method: Non-Culturable Spore Trap Examination

Reviewed By Authorized Signatory:



Laura Carson
Microbiology Lab Technical
Manager

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the client. Sample location, description, volume, etc., was provided by the client. The Client is hereby notified that due to the subjective nature of fungal analysis and the growth process of fungal infestation, laboratory samples can and do change over time relative to the originally sampled material. This report shall not be reproduced except in full, without the written consent of Environmental Hazards Services, L.L.C.



Mold Chain-of-Custody Form

SHIP TO: 7469 Whitepine Rd. Richmond, VA 23237

Phone: (800) 347-4010 FAX: (304) 275-4907

ONLINE CLIENT PORTAL AVAILABLE ECB ANALYSIS RESULTS AT www.ecb.com

LaboratoriesTM
Environmental Hazards Services, LLC

www.leadlab.com

09/10/2018
(Monday)

Company Name: Lew Corporation Account Number: 201327

Address: 181 US Highway 46

Phone: (908) 654-8068

Testing Address: CLINTON MIDDLE SCHOOL 34 Grayhawk Road

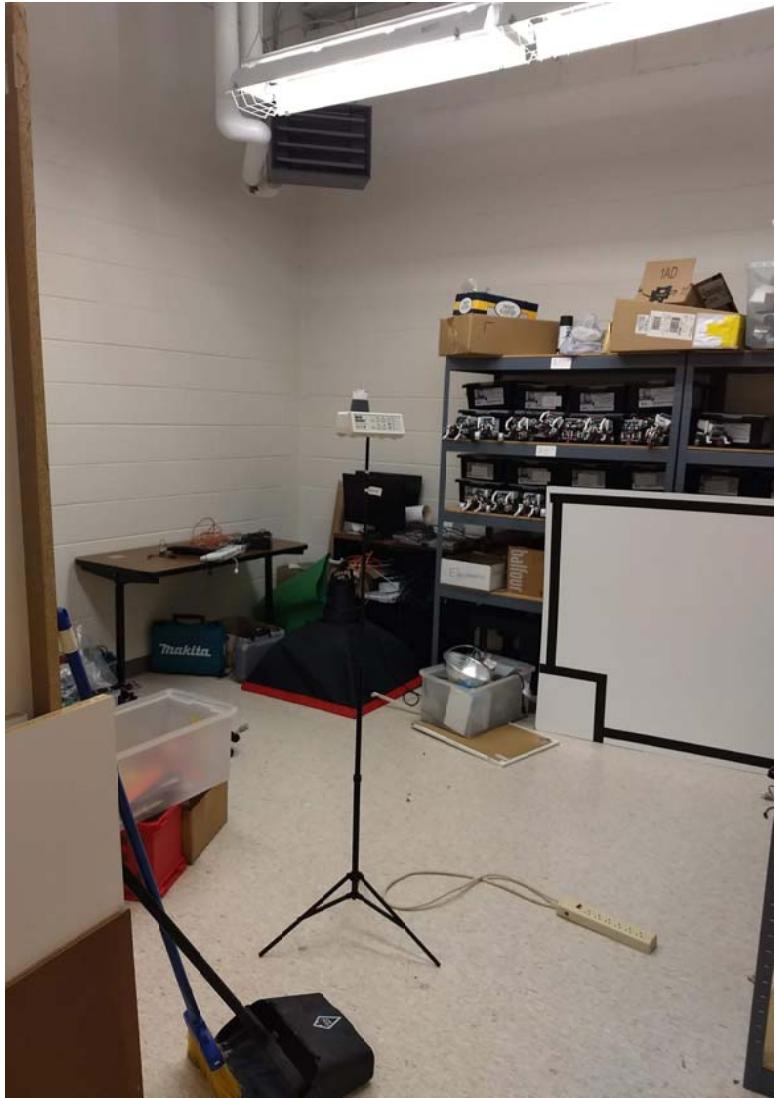
Collection Notes. *Time collected.*

Was there any Precipitation (Rain, Sleet, or Snow) 2 Hours or Less Before Taking the Samples? Yes No

TURN AROUND TIME: IF NO TAT IS SPECIFIED, SAMPLE(S) WILL BE PROCESSED AND CHARGED AS 3 DAY TAT

		1 Day	2 Day	3 Day	Air/Non Viable	Air-O-Cell = AOC	Spore Trap	Swab Sample
	Same Day				Bulk = B Swab = S WallCheck = W Bio Tape = T	Cyclex D = C BioSIS = B MicroS/M5	Non-Porous = NP Semi-Porous = SP Porous = P	Surface
		* Weekend – Must Call Ahead						
Sample No.	Sample Type	Sample Location	Air Samples	Swab Samples	Qualitative Particulate Analysis (Additional \$10.00 per sample)	Comment		
101023~1	AIR	158 B MAIN CLASSROOM	Air Col	Air Volume (Total Liters) 75L	Surface Type (NP/SP/P) (in Square Feet - ft ²)			
-2		158B Sprayer Room						
↓	~3	OUTSIDE	↓	↓				
Released by:	MICHAEL MCGEE	Signature:	Miss Mac	Date/Time:	9/9/18			
Received by:	T. Kelly	Signature:		Date/Time:	9/10/18 11:49			

APPENDIX C
Photograph(s)



158B Storage Room



158B Main Classroom