HAYES MICROBIAL CONSULTING

#22038555

Analysis Report prepared for

Restoration 1 of Southern West Virginia

81 Brookeview Manor Drive
Chapmanville, WV 25508

Phone: **(304) 601-4900**

Kermit Middle School

Collected: **September 28, 2022**
Received: **September 30, 2022**
Reported: **September 30, 2022**

We would like to thank you for trusting Hayes Microbial for your analytical needs!
We received 25 samples by FedEx in good condition for this project on September 30th, 2022.

The results in this analysis pertain only to this job, collected on the stated date, and should not be used in the interpretation of any other job. This report may not be duplicated, except in full, without the written consent of Hayes Microbial Consulting, LLC..

This laboratory bears no responsibility for sample collection activities, analytical method limitations, or your use of the test results. Interpretation and use of test results are your responsibility. Any reference to health effects or interpretation of mold levels is strictly the opinion of Hayes Microbial. In no event, shall Hayes Microbial or any of its employees be liable for lost profits or any special, incidental or consequential damages arising out of the use of these test results.

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Spore Trap
SOP - HMC#101

Sample Number	1	1	2	2	3	3	4	4
Sample Name	**Outside**		**Room 160 (Air)**		**Room 153 (Air)**		**Room 141 (Air)**	
Sample Volume	75.00 liter		75.00 liter		75.00 liter		75.00 liter	
Reporting Limit	13 spores/m³		13 spores/m³		13 spores/m³		13 spores/m³	
Background	2		2		2		2	
Fragments	ND		ND		ND		ND	

Organism	Raw Count	Count / m³	% of Total	Raw Count	Count / m³	% of Total	Raw Count	Count / m³	% of Total	Raw Count	Count / m³	% of Total
Alternaria	1	13	1.2%									
Ascospores	15	200	17.6%	1	13	25.0%	1	13	50.0%	2	27	100.0%
Aspergillus|Penicillium												
Basidiospores	9	120	10.6%									
Bipolaris|Drechslera												
Chaetomium												
Cladosporium	60	800	70.6%				1	13	50.0%			
Curvularia				3	40	75.0%						
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes												
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	85	1133	100%	4	53	100%	2	26	100%	2	27	100%

Water Damage Indicator | Common Allergen | Slightly Higher than Baseline | Significantly Higher than Baseline | Ratio Abnormality

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Project Analyst: Ramesh Poluri, PhD P. Ramesh Date: **09 - 30 - 2022**

Reviewed By: Steve Hayes, BSMT Stephen N. Hayes Date: **09 - 30 - 2022**

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Spore Trap
SOP - HMC#101

Sample Number	5	5
Sample Name	**Room 134 (Air)**	
Sample Volume	75.00 liter	
Reporting Limit	13 spores/m^3	
Background	2	
Fragments	ND	

Organism	Raw Count	Count / m^3	% of Total
Alternaria			
Ascospores	2	27	7.1%
Aspergillus|Penicillium	26	347	92.9%
Basidiospores			
Bipolaris|Drechslera			
Chaetomium			
Cladosporium			
Curvularia			
Epicoccum			
Fusarium			
Memnoniella			
Myxomycetes			
Pithomyces			
Stachybotrys			
Stemphylium			
Torula			
Ulocladium			
Total	28	374	100%

Water Damage Indicator | Common Allergen | Slightly Higher than Baseline | Significantly Higher than Baseline | Ratio Abnormality

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Direct Analysis
SOP - HMC#102

#6	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
6 - 134		No Fungi Detected		

#7	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
7 - 137		Cladosporium	Light	Few

#8	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
8 - 136		Cladosporium	Light	Trace

#9	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
9 - 135		Cladosporium	Heavy	Few
		Curvularia	Rare	ND
		Epicoccum	Rare	ND

#10	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
10 - 140		Cladosporium	Rare	Trace

#11	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
11 - 141		Cladosporium	Light	Few

#12	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
12 - 143		Cladosporium	Moderate	Few

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Direct Analysis
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#13	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
13 - 144		Cladosporium	Rare	ND
		Myxomycetes	Rare	ND

#14	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
14 - 145		Cladosporium	Moderate	Few

#15	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
15 - 148		Cladosporium	Rare	ND
		Myxomycetes	Rare	ND

#16	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
16 - 157		Myxomycetes	Rare	ND

#17	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
17 - 154		Cladosporium	Rare	ND

#18	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
18 - 160		Cladosporium	Heavy	Many

#19	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
19 - 161		Cladosporium	Moderate	Few

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Direct Analysis
SOP - HMC#102

#20	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
20 - 162		Cladosporium	Heavy	Many

#21	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
21 - 163		Cladosporium	Moderate	Few

#22	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
22 - 150		No Fungi Detected		

#23	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
23 - 153		Alternaria	Rare	ND
		Cladosporium	Light	Trace
		Myxomycetes	Rare	ND

#24	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
24 - 155		Curvularia	Rare	ND
		Myxomycetes	Rare	ND

#25	Swab (1.00 cm2)	Organism	Spore Estimate	Mycelial Estimate
25 - 159		Cladosporium	Rare	Trace
		Myxomycetes	Rare	ND

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Spore Trap Information

Reporting Limit	The Reporting Limit is the lowest number of spores that can be detected based on the total volume of the sample collected and the percentage of the slide that is counted. At Hayes Microbial, 100% of the slide is read so the LOD is based solely on the total volume. Raw spore counts that exceed 500 spores will be estimated.
Blanks	Results have not been corrected for field or laboratory blanks.
Background	The Background is the amount of debris that is present in the sample. This debris consists of skin cells, dirt, dust, pollen, drywall dust and other organic and non-organic matter. As the background density increases, the likelihood of spores, especially small spores such as those of Aspergillus and Penicillium may be obscured. The background is rated on a scale of 1 to 5 and each level is determined as follows: **NBD:** No background detected due to possible pump or cassette malfunction. Recollect sample. (Field Blanks will display NBD) **1 :** <5% of field occluded. No spores will be uncountable. **2 :** 5-25% of field occluded. **3 :** 25-75% of field occluded. **4 :** 75-90% of field occluded. **5 :** >90% of field occluded. Suggested recollection of sample.
Fragments	Fragments are small pieces of fungal mycelium or spores. They are not identifiable as to type and when present in very large numbers, may indicate the presence of mold amplification.
Control Comparisons	There are no national standards for the numbers of fungal spores that may be present in the indoor environment. As a general rule and guideline that is widely accepted in the indoor air quality field, the numbers and types of spores that are present in the indoor environment should not exceed those that are present outdoors at any given time. There will always be some mold spores present in "normal" indoor environments. The purpose of sampling and counting spores is to help determine whether an abnormal condition exists within the indoor environment and if it does, to help pinpoint the area of contamination. Spore counts should not be used as the sole determining factor of mold contamination. There are many factors that can cause anomalies in the comparison of indoor and outdoor samples due to the dynamic nature of both of those environments.
Water Damage Indicator Common Allergen Slightly Higher than Baseline Significantly Higher than Baseline Ratio Abnormality	**Blue:** These molds are commonly seen in conditions of prolonged water intrusion and usually indicate a problem. **Green:** Although all molds are potential allergens, these are the most common allergens that may be found indoors. **Orange:** The spore count is slightly higher than the outside count and may or may not indicate a source of contamination. **Red:** The spore count is significantly higher than the baseline count and probably indicates a source of contamination. **Violet:** The types of spores found indoors should be similar to the ones that were identified in the baseline sample. Significant increases (more than 25%) in the ratio of a particular spore type may indicate the presence of abnormal levels of mold, even if the total number of spores of that type is lower in the indoor environment than it was outdoors.
Color Coding	Fungi that are present in indoor samples at levels lower than 200 per cubic meter are not color coded on the report, unless they are one of the water damage indicators.

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Spore Estimate		Percentages
ND	None Detected	0%
Rare	Less than 10 spores	< 1%
Light	10 - 99 spores	1-10%
Moderate	100 - 999 spores	11-25%
Heavy	1000 - 9999 spores	26-50%
Very Heavy	10000 or greater spores	51-100%

Mycelial Estimate	
ND	None Detected No active growth at site.
Trace	Very small amount of Mycelium Probably no active growth at site.
Few	Some Mycelium Possible active growth at site.
Many	Large amount of Mycelium Probable active growth at site.

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Organism Descriptions

Alternaria

Habitat: Commonly found outdoors in soil and decaying plants. Indoors, it is commonly found on window sills and other horizontal surfaces.

Effects: A common allergen and has been associated with hypersensitivity pneumonitis. Alternaria is capable of producing toxic metabolites which may be associated with disease in humans or animals. Occasionally an agent of onychomycosis, ulcerated cutaneous infection and chronic sinusitis, principally in the immunocompromised patient.

Ascospores

Habitat: A large group consisting of more than 3000 species of fungi. Common plant pathogens and outdoor numbers become very high following rain. Most of the genera are indistinguishable by spore trap analysis and are combined on the report.

Effects: Health affects are poorly studied, but many are likely to be allergenic.

Aspergillus|Penicillium

Habitat: The most common fungi isolated from the environment. Very common in soil and on decaying plant material. Are able to grow well indoors on a wide variety of substrates.

Effects: This group contains common allergens and many can cause hypersensitivity pneumonitis. They may cause extrinsic asthma, and many are opportunistic pathogens. Many species produce mycotoxins which may be associated with disease in humans and other animals. Toxin production is dependent on the species, the food source, competition with other organisms, and other environmental conditions.

Basidiospores

Habitat: A common group of Fungi that includes the mushrooms and bracket fungi. They are saprophytes and plant pathogens. In wet conditions they can cause structural damage to buildings.

Effects: Common allergens and are also associated with hypersensitivity pneumonitis.

Cladosporium

Habitat: One of the most common genera worldwide. Found in soil and plant debris and on the leaf surfaces of living plants. The outdoor numbers are lower in the winter and often relatively high in the summer, especially in high humidity. The outdoor numbers often spike in the late afternoon and evening. Indoors, it can be found growing on textiles, wood, sheetrock, moist window sills and in HVAC supply ducts.

Effects: A common allergen, producing more than 10 allergenic antigens and a common cause of hypersensitivity pneumonitis.

Curvularia

Habitat: They exist in soil and plant debris, and are plant pathogens.

Effects: They are allergenic and a common cause of allergic fungal sinusitis. An occasional cause of human infection, including keratitis, sinusitis, onychomycosis, mycetoma, pneumonia, endocarditis and desseminated infection, primarily in the immunocompromised.

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Epicoccum

Habitat: It is found in soil and plant litter and is a plant pathogen. It can grow indoors on a variety of substrates, including paper and textiles and is commonly found on wet drywall.

Effects: It is a common allergen. No cases of infection have been reported in humans.

Myxomycetes

Habitat: Found on decaying plant material and as a plant pathogen.

Effects: Some allergenic properties reported, but generally pose no health concerns to humans.