MOLD SAMPLING
FINAL REPORT

For:
Saline Area Schools
7265 North Ann Arbor Street
Saline, Michigan 48176

At:
Saline Middle School
7190 North Maple Road
Saline, Michigan 48176

By:
Nova Environmental, Inc.
5300 Plymouth Rd.
Ann Arbor, Michigan 48105

Project #: CI0511/MS193-MS194

August 27, 2025

ENVIRONMENTAL, INC.
5300 PLYMOUTH ROAD
ANN ARBOR, MICHIGAN 48105
734-930-0995

INTRODUCTION/BACKGROUND

On August 20, 2025, Mr. Cody Pickard, Facilities Manager for Saline Area Schools contacted Nova Environmental, Inc. and indicated that there were suspect discoloration spots within Saline Middle School. Upon a discussion, it was determined that tape lift samples of the suspected mold as well as mold air samples be collected. On August 21, 2025, an environmental consultant for Nova Environmental, Inc. arrived on-site to collect the samples to determine the type of mold present.

Nova Environmental representatives returned on August 22, 2025, to conduct a thorough investigation of all areas within the facility and met with the remediation company site to go over the EPA mold remediation guidelines.

On August 24, 2025, representatives from Nova Environmental met with the restoration company at Saline Middle School to go over the EPA mold remediation guidelines.

On August 26, 2025, after remediation was completed, Nova Environmental arrived on-site to conduct mold air sampling prior to the reoccupation of the facility.

METHODS

Nova Environmental, Inc. collected mold bulk tape lift samples from areas of discoloration within Saline Middle School as well as limited indoor air quality-monitoring activities.

The investigation included the following:

- Bulk mold tape lift sampling of suspect discoloration spots
- Mold air sampling in applicable spaces

INVESTIGATION SUMMARY

Based on the tape lift samples and mold air samples conducted on August 21, 2025, it appears that the discoloration noted by The District was mold.

After remediation, the mold air sampling demonstrated substantially higher levels of mold spores on the outdoor air than the indoor air with all molds being the same or similar to those that appear naturally outside.

TAPE LIFT SAMPLING

To confirm the presence of fungal or mold growth, tape lift samples are collected in areas of component discoloration or in locations of suspected mold growth. There was a total of fifteen (15) tape lift sample collected from within Saline Middle School (see attached photos in Appendix C.)

The result of the tape lift samples demonstrated trace to high amounts of various common molds as well as medium to high amounts of Stachybotrys spores in the "R" Hallway near R206, and Room Y103. It should be noted that Stachybotrys is also commonly known as "black mold".

Information regarding the type of mold spores identified is located in appendix D of this report.

AIRBORNE FUNGAL SPORE SAMPLING RESULTS

Bioaerosols are defined as materials that have been finely divided and suspending in the air (aerosol) that a biological origin or activity (bio-). Or simply, these are living or dead bacteria, mold and fungi or the spores of mold and fungi. Individuals may react to the entire bacteria, mold and fungi or its spores, or react to mycotoxins, the chemicals that the fungi produce as a by-product of their metabolism. These "biological particles" and mycotoxins can affect different people in different ways and have the potential to cause a variety of physical symptoms. Fungal air sampling can be conducted after a definite source has been identified, as a pro-active means of characterizing a building's air or to possibly eliminate a major fungal infestation as the cause of occupant complaints. Although there are no regulatory standards regarding exposures to molds, comparisons between samples can be reviewed in an attempt to determine if potential indoor mold amplification sites exist, with the results being reported a Fungal Structures/m^3. Variables such as outdoor fungal types and concentrations as well as the number and specific types of fungal organisms indoors and their potential sources, must all be considered when interpreting sample results; no one comparison or interpretation is typically appropriate.

On August 21, 20255 fungal air sampling was conducted in order to characterize the indoor fungal spore composition in applicable areas of the building. There was a total of seven fungal spore samples collected within Saline Middle School. They included A01 (R105), A02 (B102) A03 (Orchestra Room), A04 (Choir Room), A05 (Building Engineer), A06 (R101/R102), and A07 (Exterior). Samples A07 and A05 were collected as control samples while samples A01-A04 and A06 were collected in the areas of concern.

As identified on the attached analytical results sheets, the sample result for A01 (R105) total fungal counts per cubic meter (counts/m^3) was 2,480, the sample result for A02 (B102) total fungal counts per cubic meter (counts/ m^3) was 1,800, the sample result for A03 (Orchestra Room) total fungal counts per cubic meter (counts/ m^3) was 7,780 , the sample result for A04 (Choir Room) total fungal counts per cubic meter (counts/ m^3) was 347, the sample result for A05 (Building Engineer) total fungal counts per cubic meter (counts/ m^3) was 444, the sample result for A06 (R101/R102) total fungal counts per cubic meter (counts/ m^3) was 2,000, while the sample result for A07 (Exterior) was 8,170 counts/m^3. These results show an elevated rate of fungal spores in various of spots throughout the facility. While all the interior samples had less fungal spores than the exterior sample, there was a single Stachybotrys spore found inside the Orchestra Room.

After completing remediation on August 24, 2025, fourteen more air samples were collected throughout the building on August 26, 2025.

The sample result for A01 (B207) total fungal counts per cubic meter (counts/m^3) was 174, the sample result for A02 (B202) total fungal counts per cubic meter (counts/ m^3) was 130, the sample result for A03 (Media Center) total fungal counts per cubic meter (counts/ m^3) was 262, the sample result for A04 (Health Room) total fungal counts per cubic meter (counts/ m^3) was 217, the sample result for A05 (R102) total fungal counts per cubic meter (counts/ m^3) was 87, the sample result for A06 (R203) total fungal counts per cubic meter (counts/ m^3) was 174, the sample result for A07 (R304) total fungal counts per cubic meter (counts/ m^3) was 131, the sample result for A08 (R Hallway) total fungal counts per cubic meter (counts/ m^3) was 27, the sample result for A09 (P102) total fungal counts per cubic meter (counts/ m^3) was 566, the sample result for A10 (Y103) total fungal counts per cubic meter (counts/ m^3) was 304, the sample result for A11 (Cafeteria) total fungal counts per cubic meter (counts/ m^3) was 44, the sample result for A12 (Senior Center Activity Room) total fungal counts per cubic meter (counts/ m^3) was 217, the sample result for A13 (Orchestra Room) total fungal counts per cubic meter (counts/ m^3) was 3,230, while the sample result for A14 (Exterior) was 2,210 counts/m^3.

In all areas sampled with the exception of the Orchestra Room, the types of molds identified were the same or similar for the indoor samples and the exterior sample and that the exterior sample was substantially higher than those collected indoors. It appears that remediation was successful and there are no growth or amplification sites of mold within these areas at this time.

For the Orchestra Room, due to the elevated rates of Aspergillus/Penicillium spores, it is Nova Environmental's recommendation that the room be left with dehumidifiers running for 24 hours, with an additional 24 hours of time after they are shut down before re-sampling. Nova will return on Friday, August 29, 2025 to conduct the sampling.

Appendix A

TAPE LIFT SAMPLE RESULTS

Client: Saline Area Schools

Building: Saline Middle School

Location: Various

Project Number: CI0511/MS193

Nova Environmental, Inc.
Indoor Air Quality Data Sheet
Mold Bulk Sampling

Date: 08/21/2025

Nova Representative: Carol May

Outside Weather Conditions: 70°F, Overcast

Sample Number	Location	Surface	Notes
T01	B208	Chair Cushion	---
T02	B205	Carpet	---
T03	B204	South Chair	---
T04	G110	East Office	---
T05	B200	Office/Workshop Couch	---
T06	Harwood's Office	Blinds	---
T07	301	Couch	---
T08	R Hallway	Near R206	---
T09	Near P101	Chairs	---
T10	Choir Room	Piano Cover	---

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Building: Saline Middle School

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Nova Environmental, Inc.
Indoor Air Quality Data Sheet
Mold Bulk Sampling

Date: 08/21/2025

Nova Representative: Carol May

Outside Weather Conditions: 70°F, Overcast

Sample Number	Location	Surface	Notes
T11	Y103	Ceiling	---
T12	Y103 (Staff Lounge)	Ceiling	---
T13	B Hall	Ceiling - Center	---
T14	B Hall	Ceiling - Above Drinking Fountain	---
T15	B210	Above Shelving	---

PELLaboratories

Client:	Nova Environmental, Inc.	Report Version No.:	1
Project Name:	Saline Area Schools	PEL Work Order No.:	22508110
Project Address:	Saline Middle School	Date Received:	8/21/2025
Project No.:	CI0511/MS193	Date Analyzed:	8/22/2025
Project Contact:	Carol May	Sample Date :	8/21/2025
Sample Type:	Tape Lift	Received By:	Ryan Shannon
T/A Time:	24-Hour	Analyzed By:	Ryan Shannon

PEL Sample No.:	8		9		10	
Sample ID/No.:	T01		T02		T03	
Sample Description:	B208		B205		B204.5	
FUNGAL IDENTIFICATION	Spore Loading Category (1-5)	Hyphal Associated?	Spore Loading Category (1-5)	Hyphal Associated?	Spore Loading Category (1-5)	Hyphal Associated?
Aspergillus /Penicillium sp.	2 - Low				1 - Trace	
Aspergillus sp.	***1 - Trace***	Y			***1 - Trace***	Y
Hyphal Fragments	2 - Low				1 - Trace	
Epicoccum sp.			1 - Trace			
Cladosporium sp.					***3 - Medium***	Y
Penicillium sp.						
Stachybotrys/Memnoniella sp.						
Basidiospores						
Pithomyces sp.						
Alternaria sp.						
No Fungal Material Observed?						
Dust/Debris Rating	1 - Less than 5% load		2 - 5% to 25% load		1 - Less than 5% load	

*For tape lift samples, in accordance with ASTM d7658-17, PEL Laboratories categorizes both spore quantity and background level on the same 0-5 scale, based on the area selected for analysis. 0 or blank - not present. 1) Present, <5% surface coverage. 2) 5%-25% surface coverage. 3) 25%-75% surface coverage. 4) 75%-90% surface coverage. 5) >90% surface coverage. For swabs and bulk samples, which are not covered by an ASTM method, PEL uses a logarithmic reporting scheme for spores; background is still reported as above. 0 or blank - not present. 1) 1 or 2 spores found. 2) 3-10 spores found. 3) 11-100 spores found. 4) 101-1000 spores found. 5) 1001+ spores found. Spore types in ***Brown*** were found to have hyphal material associated with them, or are present at level 3 or higher, which are strong indicators of amplification.

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Project Contact:	Carol May	Sample Date :	8/21/2025
Sample Type:	Tape Lift	Received By:	Ryan Shannon
T/A Time:	24-Hour	Analyzed By:	Ryan Shannon

PEL Sample No.:	11		12		13	
Sample ID/No.:	T04		T05		T06	
Sample Description:	6110, East Office		B200, Office/Workshop		Harwood's Office	
FUNGAL IDENTIFICATION	Spore Loading Category (1-5)	Hyphal Associated?	Spore Loading Category (1-5)	Hyphal Associated?	Spore Loading Category (1-5)	Hyphal Associated?
Aspergillus /Penicillium sp.	2 - Low		***3 - Medium***		1 - Trace	
Aspergillus sp.	***2 - Low***	Y	***1 - Trace***	Y		
Hyphal Fragments	2 - Low		1 - Trace		1 - Trace	
Epicoccum sp.			1 - Trace			
Cladosporium sp.			***2 - Low***	Y	***3 - Medium***	Y
Penicillium sp.			***1 - Trace***	Y		
Stachybotrys/Memnoniella sp.						
Basidiospores						
Pithomyces sp.						
Alternaria sp.						
No Fungal Material Observed?						
Dust/Debris Rating	1 - Less than 5% load		1 - Less than 5% load		1 - Less than 5% load	

*For tape lift samples, in accordance with ASTM d7658-17, PEL Laboratories categorizes both spore quantity and background level on the same 0-5 scale, based on the area selected for analysis. 0 or blank - not present. 1) Present, <5% surface coverage. 2) 5%-25% surface coverage. 3) 25%-75% surface coverage. 4) 75%-90% surface coverage. 5) >90% surface coverage. For swabs and bulk samples, which are not covered by an ASTM method, PEL uses a logarithmic reporting scheme for spores; background is still reported as above. 0 or blank - not present. 1) 1 or 2 spores found. 2) 3-10 spores found. 3) 11-100 spores found. 4) 101-1000 spores found. 5) 1001+ spores found. Spore types in Brown were found to have hyphal material associated with them, or are present at level 3 or higher, which are strong indicators of amplification.

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Project Contact:	Carol May	Sample Date :	8/21/2025
Sample Type:	Tape Lift	Received By:	Ryan Shannon
T/A Time:	24-Hour	Analyzed By:	Ryan Shannon

PEL Sample No.:	14		15		16	
Sample ID/No.:	T07		T08		T09	
Sample Description:	301		R Hallway near R206		Chairs Near P101	
FUNGAL IDENTIFICATION	Spore Loading Category (1-5)	Hyphal Associated?	Spore Loading Category (1-5)	Hyphal Associated?	Spore Loading Category (1-5)	Hyphal Associated?
Aspergillus /Penicillium sp.	2 - Low				*3 - Medium*	
Aspergillus sp.	*2 - Low*	Y			*2 - Low*	Y
Hyphal Fragments	1 - Trace				1 - Trace	
Epicoccum sp.						
Cladosporium sp.					*2 - Low*	Y
Penicillium sp.					*1 - Trace*	Y
Stachybotrys/Memnoniella sp.			*4 - High*	Y		
Basidiospores			*2 - Low*	Y		
Pithomyces sp.						
Alternaria sp.						
No Fungal Material Observed?						
Dust/Debris Rating	1 - Less than 5% load		1 - Less than 5% load		1 - Less than 5% load	

*For tape lift samples, in accordance with ASTM d7658-17, PEL Laboratories categorizes both spore quantity and background level on the same 0-5 scale, based on the area selected for analysis. 0 or blank - not present. 1) Present, <5% surface coverage. 2) 5%-25% surface coverage. 3) 25%-75% surface coverage. 4) 75%-90% surface coverage. 5) >90% surface coverage. For swabs and bulk samples, which are not covered by an ASTM method, PEL uses a logarithmic reporting scheme for spores; background is still reported as above. 0 or blank - not present. 1) 1 or 2 spores found. 2) 3-10 spores found. 3) 11-100 spores found. 4) 101-1000 spores found. 5) 1001+ spores found. Spore types in Brown were found to have hyphal material associated with them, or are present at level 3 or higher, which are strong indicators of amplification.

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Project Contact:	Carol May	Sample Date :	8/21/2025
Sample Type:	Tape Lift	Received By:	Ryan Shannon
T/A Time:	24-Hour	Analyzed By:	Ryan Shannon

PEL Sample No.:	17		18		19	
Sample ID/No.:	T10		T11		T12	
Sample Description:	Choir Room		Y103		Y013 (Staff Lounge)	
FUNGAL IDENTIFICATION	Spore Loading Category (1-5)	Hyphal Associated?	Spore Loading Category (1-5)	Hyphal Associated?	Spore Loading Category (1-5)	Hyphal Associated?
Aspergillus /Penicillium sp.						
Aspergillus sp.						
Hyphal Fragments						
Epicoccum sp.						
Cladosporium sp.			*3 - Medium*	Y	1 - Trace	
Penicillium sp.						
Stachybotrys/Memnoniella sp.			*3 - Medium*	Y		
Basidiospores						
Pithomyces sp.	1 - Trace					
Alternaria sp.					*2 - Low*	Y
No Fungal Material Observed?						
Dust/Debris Rating	2 - 5% to 25% load		1 - Less than 5% load		3 - 25% to 75% load	

*For tape lift samples, in accordance with ASTM d7658-17, PEL Laboratories categorizes both spore quantity and background level on the same 0-5 scale, based on the area selected for analysis. 0 or blank - not present. 1) Present, <5% surface coverage. 2) 5%-25% surface coverage. 3) 25%-75% surface coverage. 4) 75%-90% surface coverage. 5) >90% surface coverage. For swabs and bulk samples, which are not covered by an ASTM method, PEL uses a logarithmic reporting scheme for spores; background is still reported as above. 0 or blank - not present. 1) 1 or 2 spores found. 2) 3-10 spores found. 3) 11-100 spores found. 4) 101-1000 spores found. 5) 1001+ spores found. Spore types in Brown were found to have hyphal material associated with them, or are present at level 3 or higher, which are strong indicators of amplification.

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Project No.:	CI0511/MS193	Date Analyzed:	8/22/2025
Project Contact:	Carol May	Sample Date :	8/21/2025
Sample Type:	Tape Lift	Received By:	Ryan Shannon
T/A Time:	24-Hour	Analyzed By:	Ryan Shannon

PEL Sample No.:	20		21		22	
Sample ID/No.:	T13		T14		T15	
Sample Description:	B Hall, Center		B Hall, by Drinking Fount.		B210, Above Shelving	
FUNGAL IDENTIFICATION	Spore Loading Category (1-5)	Hyphal Associated?	Spore Loading Category (1-5)	Hyphal Associated?	Spore Loading Category (1-5)	Hyphal Associated?
Aspergillus /Penicillium sp.						
Aspergillus sp.						
Hyphal Fragments	2 - Low		***3 - Medium***			
Epicoccum sp.						
Cladosporium sp.			***2 - Low***	Y	***4 - High***	Y
Penicillium sp.						
Stachybotrys/Memnoniella sp.						
Basidiospores						
Pithomyces sp.						
Alternaria sp.			***2 - Low***	Y		
Ulocladium sp.	***3 - Medium***	Y				
Myxomycetes/Periconia/Smut sp.			***3 - Medium***	Y		
No Fungal Material Observed?						
Dust/Debris Rating	1 - Less than 5% load		3 - 25% to 75% load		1 - Less than 5% load	

*For tape lift samples, in accordance with ASTM d7658-17, PEL Laboratories categorizes both spore quantity and background level on the same 0-5 scale, based on the area selected for analysis. 0 or blank - not present. 1) Present, <5% surface coverage. 2) 5%-25% surface coverage. 3) 25%-75% surface coverage. 4) 75%-90% surface coverage. 5) >90% surface coverage. For swabs and bulk samples, which are not covered by an ASTM method, PEL uses a logarithmic reporting scheme for spores; background is still reported as above. 0 or blank - not present. 1) 1 or 2 spores found. 2) 3-10 spores found. 3) 11-100 spores found. 4) 101-1000 spores found. 5) 1001+ spores found. Spore types in ***Brown*** were found to have hyphal material associated with them, or are present at level 3 or higher, which are strong indicators of amplification.

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Appendix B

MOLD AIR SAMPLE RESULTS

Client: Saline Area Schools

Building: Saline Middle School

Location: Various

Project Number: CI0511/MS193

Nova Environmental, Inc.
Indoor Air Quality Data Sheet
Fungal Spore Air Sampling

Date: 08/21/2025

Nova Representative: Carol May

Outside Weather Conditions: 70°F, Overcast

Sample Number	Location	Pump I.D.	Start Time	Stop Time	Sample Time (min)	Flow Rate (L/min)	Volume (L)	Notes
A01	R105	260	8:52 AM	8:57 AM	5	14.9	74.5	DC, VO, WC
A02	B102	260	9:06 AM	9:11 AM	5	14.9	74.5	DC, VO, WC
A03	Band Room	260	9:42 AM	9:47 AM	5	14.9	74.5	DC, VO, WC
A04	Choir Room	260	9:54 AM	9:59 AM	5	14.9	74.5	DC, VO, WC
A05	Building Engineer	260	10:05 AM	10:10 AM	5	14.9	74.5	DC, VO
A06	R101/R102	260	10:42 AM	10:47 AM	5	14.9	74.5	DC, VO
A07	Exterior	260	11:02 AM	11:07 AM	5	14.9	74.5	---

DO = Door Open, DC = Door Closed, WO = Windows Open, WC = Windows Closed, VO = Vent On, VF = Vent Off, AFL = Above Floor Level, AGL = Above Ground
min = minutes, L = Liters, Cassette: Zefon Air-O-Cell®

PELLaboratories

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Project Address:	Saline Middle School	Date Received:	8/21/2025
Project No.:	CI0511/MS193	Date Analyzed:	8/22/2025
Project Contact:	Carol May	Sample Date :	8/21/2025
Sample Type:	Spore Trap - Air-O-Cell	Received By:	Ryan Shannon
T/A Time:	24-Hour	Analyzed By:	Ryan Shannon

PEL Sample No.:	1	2	3
Sample ID/No.:	A01	A02	A03
Sample Description:	R 105	B 102	Orchestra Room
Volume (liters):	74.5	74.5	74.5

FUNGAL IDENTIFICATION	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3
Ascospores	1	1.8%	43	43	1	2.4%	43	43				
Basidiospores					1	2.4%	43	43	1	0.6%	43	43
Cladosporium sp.	2	3.5%	43	87	31	75.0%	43	1350	1	0.6%	43	43
Aspergillus /Penicillium sp.	49	85.9%	43	2130	4	9.7%	43	174	173	96.7%	43	7520
Rust sp.	5	8.8%	43	217	4	9.7%	43	174	3	1.7%	43	130
Alternaria sp.					1	0.7%	13	13				
Stachybotrys/Memnoniella sp.									1	0.6%	43	43
Pithomyces sp.												
Polythrincium sp.												
Epicoccum sp.												
Ganoderma sp.												
Total	57			2480	42			1800	179			7780
Hyphal Fragments *												
Pollen												
Dust/Debris*	2 - 5% to 25% load				3 - 25% to 75% load				2 - 5% to 25% load			

* The presence of dust/debris on an air cassette may mask the presence of fungal spores thereby creating negative quantitation bias. In accordance with ASTM d7391-17, PEL Laboratories categorizes percentages of dust/debris as follows: **0** - No particulate matter present. Indicates either a blank or improper sampling. **1** - 0%-5% total loading. Results minimally affected. 2 - 5%-25% total loading, 3 - 25%-75% total loading, 4 - 75%-90% total loading. Negative bias is expected, increasing with the percent occluded. 5 - 90% plus total loading. Overloaded - quantification not possible.

* Hyphal Fragments and Pollen are not included in calculations

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Project Contact:	Carol May	Sample Date :	8/21/2025
Sample Type:	Spore Trap - Air-O-Cell	Received By:	Ryan Shannon
T/A Time:	24-Hour	Analyzed By:	Ryan Shannon

PEL Sample No.:	4	5	6
Sample ID/No.:	A04	A05	A06
Sample Description:	Choir Room	Building Engineer (Control)	R 102/R101
Volume (liters):	74.5	74.5	74.5

FUNGAL IDENTIFICATION	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3
Ascospores					1	9.8%	43	43	1	2.2%	43	43
Basidiospores					1	9.8%	43	43	1	2.2%	43	43
Cladosporium sp.					5	48.9%	43	217	26	56.5%	43	1130
Aspergillus /Penicillium sp.	7	87.6%	43	304	2	19.6%	43	87	16	34.8%	43	695
Rust sp.	1	12.5%	43	43	2	6.0%	13	27	1	2.2%	43	43
Alternaria sp.												
Stachybotrys/Memnoniella sp.												
Pithomyces sp.					1	3.0%	13	13				
Polythrincium sp.					1	3.0%	13	13				
Epicoccum sp.									1	2.2%	43	43
Ganoderma sp.												
Total	8			347	13			444	46			2000
Hyphal Fragments *												
Pollen												
Dust/Debris*	1 - Less than 5% load				1 - Less than 5% load				3 - 25% to 75% load			

* The presence of dust/debris on an air cassette may mask the presence of fungal spores thereby creating negative quantitation bias. In accordance with ASTM d7391-17, PEL Laboratories categorizes percentages of dust/debris as follows: **0** - No particulate matter present. Indicates either a blank or improper sampling. **1** - 0%-5% total loading. Results minimally affected. 2 - 5%-25% total loading, 3 - 25%-75% total loading, 4 - 75%-90% total loading. Negative bias is expected, increasing with the percent occluded. 5 - 90% plus total loading. Overloaded - quantification not possible.

* Hyphal Fragments and Pollen are not included in calculations

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Project Contact:	Carol May	Sample Date :	8/21/2025
Sample Type:	Spore Trap - Air-O-Cell	Received By:	Ryan Shannon
T/A Time:	24-Hour	Analyzed By:	Ryan Shannon

PEL Sample No.:	**7**		
Sample ID/No.:	**A07**		
Sample Description:	**Exterior**		
Volume (liters):	**74.5**		

FUNGAL IDENTIFICATION	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3
Ascospores	55	29.3%	43	2390								
Basidiospores	66	35.1%	43	2870								
Cladosporium sp.	46	24.5%	43	2000								
Aspergillus /Penicillium sp.	1	0.5%	43	43								
Rust sp.	15	8.0%	43	652								
Alternaria sp.												
Stachybotrys/Memnoniella sp.												
Pithomyces sp.	3	1.6%	43	130								
Polythrincium sp.												
Epicoccum sp.	1	0.5%	43	43								
Ganoderma sp.	1	0.5%	43	43								
Total	188			8170								
Hyphal Fragments *												
Pollen	3		43	130								
Dust/Debris*	2 - 5% to 25% load											

* The presence of dust/debris on an air cassette may mask the presence of fungal spores thereby creating negative quantitation bias. In accordance with ASTM d7391-17, PEL Laboratories categorizes percentages of dust/debris as follows: **0** - No particulate matter present. Indicates either a blank or improper sampling. **1** - 0%-5% total loading. Results minimally affected. 2 - 5%-25% total loading, 3 - 25%-75% total loading, 4 - 75%-90% total loading. Negative bias is expected, increasing with the percent occluded. 5 - 90% plus total loading. Overloaded - quantification not possible.

* Hyphal Fragments and Pollen are not included in calculations

Analyst Signature: _____ Date of Report: 8/22/2025

Reviewer Signature: _____ Date of Report: 8/22/2025

Client: Saline Area Schools

Building: Saline Middle School

Location: Various

Project Number: CI0511/MS194

Nova Environmental, Inc.
Indoor Air Quality Data Sheet
Fungal Spore Air Sampling

Date: 08/26/2025

Nova Representative: Carol May & Russell Love

Outside Weather Conditions: 58°F

Sample Number	Location	Pump I.D.	Start Time	Stop Time	Sample Time (min)	Flow Rate (L/min)	Volume (L)	Notes
A01	B207	245	7:10 AM	7:15 AM	5	14.86	74.3	DC, WC, VO
A02	B202	260	7:10 AM	7:15 AM	5	14.90	74.5	DO, VO
A03	Media Center	245	7:20 AM	7:25 AM	5	14.86	74.3	DO, VO
A04	Health Room	260	7:23 AM	7:28 AM	5	14.90	74.5	DC, VO
A05	R102	245	7:31 AM	7:36 AM	5	14.86	74.3	DC, WC, VO
A06	R203	260	7:33 AM	7:38 AM	5	14.90	74.5	DC, WC, VO
A07	R304	245	7:40 AM	7:45 AM	5	14.86	74.3	DC, WC
A08	R Hallway	260	7:44 AM	7:49 AM	5	14.90	74.5	DC, VO
A09	P102	245	7:49 AM	7:54 AM	5	14.86	74.3	DC, WC
A10	Y103	260	7:55 AM	8:00 AM	5	14.90	74.5	DO, WC, VO

DO = Door Open, DC = Door Closed, WO = Windows Open, WC = Windows Closed, VO = Vent On, VF = Vent Off, AFL = Above Floor Level, AGL = Above Ground
min = minutes, L = Liters, Cassette: Zefon Air-O-Cell®

Client: Saline Area Schools

Building: Saline Middle School

Location: Various

Project Number: CI0511/MS194

Nova Environmental, Inc.
Indoor Air Quality Data Sheet
Fungal Spore Air Sampling

Date: 08/26/2025

Nova Representative: Carol May & Russell Love

Outside Weather Conditions: 58°F

Sample Number	Location	Pump I.D.	Start Time	Stop Time	Sample Time (min)	Flow Rate (L/min)	Volume (L)	Notes
A11	Cafeteria	245	7:58 AM	8:03 AM	5	14.86	74.3	DC, WC
A12	Senior Center Activity Room	260	8:06 AM	8:11 AM	5	14.90	74.5	DC, WC, VO
A13	Orchestra Room	245	8:08 AM	8:13 AM	5	14.86	74.3	DC, WC
A14	Exterior	260	8:17 AM	8:22 AM	5	14.90	74.5	---

DO = Door Open, DC = Door Closed, WO = Windows Open, WC = Windows Closed, VO = Vent On, VF = Vent Off, AFL = Above Floor Level, AGL = Above Ground
min = minutes, L = Liters, Cassette: Zefon Air-O-Cell®

PELLaboratories

Client:	Nova Environmental	Report Version No.:	1
Project Name:	Saline Middle School	PEL Work Order No.:	22508139
Project Address:	Various	Date Received:	8/26/2025
Project No.:	CI0511/MS194	Date Analyzed:	8/26/2025
Project Contact:	Meghan McCarthy	Sample Date :	8/26/2025
Sample Type:	Spore Trap - Air-O-Cell	Received By:	Kaylee Guzi
T/A Time:	Rush	Analyzed By:	Ryan Shannon

PEL Sample No.:	**1**	**2**	**3**
Sample ID/No.:	**A01**	**A02**	**A03**
Sample Description:	**B207**	**B202**	**Media Center**
Volume (liters):	**74.3**	**74.5**	**74.3**

FUNGAL IDENTIFICATION	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3
Ascospores					1	33.4%	43	43				
Basidiospores	1	25.1%	44	44								
Cladosporium sp.	1	25.1%	44	44	1	33.4%	43	43	5	83.2%	44	218
Aspergillus /Penicillium sp.	2	50.1%	44	87					1	16.6%	44	44
Rust sp.					1	33.4%	43	43				
Myxomycetes/Periconia/Smut sp.												
Total	4			174	3			130	6			262
Hyphal Fragments *												
Pollen												
Dust/Debris*	1 - Less than 5% load				1 - Less than 5% load				1 - Less than 5% load			

* The presence of dust/debris on an air cassette may mask the presence of fungal spores thereby creating negative quantitation bias. In accordance with ASTM d7391-17, PEL Laboratories categorizes percentages of dust/debris as follows: **0** - No particulate matter present. Indicates either a blank or improper sampling. **1** - 0%-5% total loading. Results minimally affected. 2 - 5%-25% total loading, 3 - 25%-75% total loading, 4 - 75%-90% total loading. Negative bias is expected, increasing with the percent occluded. 5 - 90% plus total loading. Overloaded - quantification not possible.

* Hyphal Fragments and Pollen are not included in calculations

Analyst Signature: _____ Date of Report: 8/26/2025

Reviewer Signature: _____ Date of Report: 8/26/2025

PELLaboratories

Client:	Nova Environmental	Report Version No.:	1
Project Name:	Saline Middle School	PEL Work Order No.:	22508139
Project Address:	Various	Date Received:	8/26/2025
Project No.:	CI0511/MS194	Date Analyzed:	8/26/2025
Project Contact:	Meghan McCarthy	Sample Date :	8/26/2025
Sample Type:	Spore Trap - Air-O-Cell	Received By:	Kaylee Guzi
T/A Time:	Rush	Analyzed By:	Ryan Shannon

PEL Sample No.:	4	5	6
Sample ID/No.:	A04	A05	A06
Sample Description:	Health Room	R102	R203
Volume (liters):	74.5	74.3	74.5

FUNGAL IDENTIFICATION	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3
Ascospores					1	50.0%	44	44				
Basidiospores	1	20.0%	43	43	1	50.0%	44	44	2	49.9%	43	87
Cladosporium sp.	3	59.9%	43	130					2	49.9%	43	87
Aspergillus /Penicillium sp.												
Rust sp.	1	20.0%	43	43								
Myxomycetes/Periconia/Smut sp.												
Total	5			217	2			87	4			174
Hyphal Fragments *												
Pollen												
Dust/Debris*	2 - 5% to 25% load				1 - Less than 5% load				2 - 5% to 25% load			

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* Hyphal Fragments and Pollen are not included in calculations

Analyst Signature: _____ Date of Report: 8/26/2025

Reviewer Signature: _____ Date of Report: 8/26/2025

PEL Laboratories

Client:	Nova Environmental	Report Version No.:	1
Project Name:	Saline Middle School	PEL Work Order No.:	22508139
Project Address:	Various	Date Received:	8/26/2025
Project No.:	CI0511/MS194	Date Analyzed:	8/26/2025
Project Contact:	Meghan McCarthy	Sample Date :	8/26/2025
Sample Type:	Spore Trap - Air-O-Cell	Received By:	Kaylee Guzi
T/A Time:	Rush	Analyzed By:	Ryan Shannon

PEL Sample No.:	7	8	9
Sample ID/No.:	A07	A08	A09
Sample Description:	R304	R Hallway	P102
Volume (liters):	74.3	74.5	74.3

FUNGAL IDENTIFICATION	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3
Ascospores	1	33.3%	44	44	2	100.0%	13	27	2	15.4%	44	87
Basidiospores	2	66.5%	44	87					4	30.7%	44	174
Cladosporium sp.									3	23.1%	44	131
Aspergillus /Penicillium sp.									2	15.4%	44	87
Rust sp.									1	7.7%	44	44
Myxomycetes/Periconia/Smut sp.									1	7.7%	44	44
Total	3			131	2			27	13			566
Hyphal Fragments *												
Pollen												
Dust/Debris*	1 - Less than 5% load				2 - 5% to 25% load				2 - 5% to 25% load			

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* Hyphal Fragments and Pollen are not included in calculations

Analyst Signature: _____ Date of Report: 8/26/2025

Reviewer Signature: _____ Date of Report: 8/26/2025

PEL Laboratories

Client:	Nova Environmental	Report Version No.:	1
Project Name:	Saline Middle School	PEL Work Order No.:	22508139
Project Address:	Various	Date Received:	8/26/2025
Project No.:	CI0511/MS194	Date Analyzed:	8/26/2025
Project Contact:	Meghan McCarthy	Sample Date :	8/26/2025
Sample Type:	Spore Trap - Air-O-Cell	Received By:	Kaylee Guzi
T/A Time:	Rush	Analyzed By:	Ryan Shannon

PEL Sample No.:	10	11	12
Sample ID/No.:	A10	A11	A12
Sample Description:	Y103	Cafeteria	Senior Center, Activity Room A
Volume (liters):	74.5	74.3	74.5

FUNGAL IDENTIFICATION	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3
Ascospores					1	100.0%	44	44	1	20.0%	43	43
Basidiospores	2	28.6%	43	87					1	20.0%	43	43
Cladosporium sp.	5	71.4%	43	217					2	40.0%	43	87
Aspergillus /Penicillium sp.									1	20.0%	43	43
Rust sp.												
Myxomycetes/Periconia/Smut sp.												
Total	7			304	1			44	5			217
Hyphal Fragments *												
Pollen												
Dust/Debris*	1 - Less than 5% load				1 - Less than 5% load				1 - Less than 5% load			

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* Hyphal Fragments and Pollen are not included in calculations

Analyst Signature: _____ Date of Report: 8/26/2025

Reviewer Signature: _____ Date of Report: 8/26/2025

PELLaboratories

Client:	Nova Environmental	Report Version No.:	1
Project Name:	Saline Middle School	PEL Work Order No.:	22508139
Project Address:	Various	Date Received:	8/26/2025
Project No.:	CI0511/MS194	Date Analyzed:	8/26/2025
Project Contact:	Meghan McCarthy	Sample Date :	8/26/2025
Sample Type:	Spore Trap - Air-O-Cell	Received By:	Kaylee Guzi
T/A Time:	Rush	Analyzed By:	Ryan Shannon

PEL Sample No.:	**13**				**14**							
Sample ID/No.:	**A13**				**A14**							
Sample Description:	**Orchestra Room**				**Exterior**							
Volume (liters):	**74.3**				**74.5**							
FUNGAL IDENTIFICATION	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3	Raw Count	%	LOD /m^3	Count/m^3
Ascospores	1	1.3%	44	44	10	19.6%	43	434				
Basidiospores	1	1.3%	44	44	10	19.6%	43	434				
Cladosporium sp.	6	8.1%	44	261	26	51.1%	43	1130				
Aspergillus /Penicillium sp.	66	89.2%	44	2880								
Rust sp.												
Myxomycetes/Periconia/Smut sp.												
Epicoccum sp.					1	2.0%	43	43				
Ganoderma sp.					3	5.9%	43	130				
Pithomyces sp.					1	2.0%	43	43				
Total	74			3230	51			2210				
Hyphal Fragments *												
Pollen												
Dust/Debris*	1 - Less than 5% load				4 - 75% to 90% load							

* The presence of dust/debris on an air cassette may mask the presence of fungal spores thereby creating negative quantitation bias. In accordance with ASTM d7391-17, PEL Laboratories categorizes percentages of dust/debris as follows: **0** - No particulate matter present. Indicates either a blank or improper sampling. **1** - 0%-5% total loading. Results minimally affected. 2 - 5%-25% total loading, 3 - 25%-75% total loading, 4 - 75%-90% total loading. Negative bias is expected, increasing with the percent occluded. 5 - 90% plus total loading. Overloaded - quantification not possible.

* Hyphal Fragments and Pollen are not included in calculations

Analyst Signature: _____ Date of Report: 8/26/2025

Reviewer Signature: _____ Date of Report: 8/26/2025

Appendix C

PHOTO DOCUMENTATION


SMS
XPECTATIONS
ESPECTFUL
room for others.
space.

Appendix D

FUNGAL GLOSSARY

Mold Glossary - Genera

Acremonium sp. - *Acremonium* species are found growing in plant-decaying matter, plant debris, soils, and decaying organic matter. Some species are found indoors. Due to the high water requirements of *acremonium* (water activity 0.90 – 0.98), they are considered a tertiary colonizer and marker of advanced water damage when found amplified indoors. Reported to be allergenic. Common type I and III allergen. It can produce mycetomas, infections of the nails, onychomycosis, corneal ulcers, eumycotic mycetoma, endophthalmitis, meningitis, and endocarditis.
References: De Hoog, G.S., J. Guarro, J. Gene, and M.J. Figueras. Atlas of Clinical Fungi, 2nd Edition. The Netherlands: CBS,
2000.

Alternaria sp. - *Alternaria* is a ubiquitous fungal genus that includes saprobic, endophytic and pathogenic species. Commonly found in soil, on plants and frequently found indoors, most commonly in poorly ventilated attics and other very warm, consistently damp spaces. With a water activity between 0.84-0.90, Alternaria is an early indicator of worsening water damage. In It is an important airborne allergen and common agent for hay fever, asthma, and other allergy related symptoms. ***References:*** *J.H.C. Woudenberg, J.Z. Groenewald, M. Binder, and P.W. Crous. Alternaria Redefined. 2013 CBS-KNAW Fungal Biodiversity Centre.*

Ascospore sp. – One of the most common spore types. There are over 30,000 different species in the *ascospore* category, most of which cannot be differentiated by direct microscopy. Found everywhere in nature. Spores are predominantly forcibly discharged during periods of high humidity or rain. Ascospores are rarely found amplified indoors, except occasionally on houseplants and in buildings in obviously poor condition. *Reference: Manstretta V, Rossi V. Effects of Temperature and Moisture. Perithecia in Maize Stalk Residues. Appl Environ Microbiol. 2015;82(1):184–191. Published 2015 Oct 16. doi:10.1128/AEM.02436-15*

Aspergillus sp. – One of the most common fungal genera found worldwide with about 180 species. Commonly found in soil and decaying vegetation and indoors in dust, food, and various building materials. One of the most common molds found amplified indoors. Many common food molds are *Aspergillus*. *Aspergillus* spores usually cannot be distinguished from *Penicillium* on air samples. Various species of *Aspergillus* are reported to be allergenic, to cause certain infections in compromised individuals, and some species do produce toxins thought to be unhealthy to humans. With various species having water activities as low as 0.6 and as high as 0.8, *Aspergillus* is the most common primary colonizer. Many species can grow in moist areas even without significant condensation.

Basidiospore sp. – One of the most common spore types. There are over 40,000 species in the basidiospore category, most of which cannot be distinguished by direct microscopy. Basidiospores are in general the spores of what we commonly call mushrooms. This group of spores is ubiquitous in nature and can be found anywhere there is moisture and an organic food source. Basidiospores are moisture driven as their spores disseminate during rain or in times of high humidity. Indoor amplification of undifferentiated basidiospores in uncommon, and will generally be identifiable by the mushroom growth. *Reference: John Webster and Roland Weber. Introduction to Fungus. Third Edition Pg. 550*

Bipolaris/Drechslera/Exserohilum/Helminthosporium Group*:* They belong to the group hyphomycetes and have about 50 different species. They are found in soil, plant debris, wood, and paper. *Bipolaris* has indeterminate conidiophores which extend sympodially producing a succession of large dark and transversely septate spores. Spores are basically fusoid in shape and germinate only from the end. Large spores can be deposited in the upper respiratory tract and may cause allergic fungal sinusitis, asthma, and hay fever. It is also known to produce mycotoxin (sterigmatocystin) that can damage liver and kidney in animals. The fungus may also cause keratitis and osteomyelitis on humans. The water activity of this group is generally between 0.80 and 0.85, and as such they are considered primary/secondary colonizers, and can propagate in high moisture areas without active water damage.

Chaetomium – Very commonly found amplified indoors. Considered one of the major contributors to "sick building syndrome". In nature, found growing in soil and fruiting on cellulose-rich substrata such as seeds, textiles in contact with soil, straw, sacking and dung. Wood infected by *Chaetomium* may undergo a superficial decay known as soft rot. Indoors, *Chaetomium* produces several mycotoxins including chaetoglobosins A and C, which cause a host of issues in immunocompromised individuals, and are thought to cause permanent neurological issues due to causing erosion of the myelin sheath on neurons. Due to relatively high water activity (0.91-0.94), considered a 'tertiary colonizer', and will only amplify in significant water damage.

Lillard S (2004). *Chaetomium*

Cladosporium - The most commonly identified outdoor and indoor fungus. The outdoor numbers are reduced in the winter and are often high in the summer, often well over 10000/m^3. 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. One of the most common molds found amplified indoors. Cladosporium has a water activity of 0.86-0.88, and is considered a secondary colonizer. It generally needs a source of water beyond ambient moisture, but any amount of condensed humidity is sufficient for growth. *Cladosporium* is thought to be one of the main causes of 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.

Curvularia – Very similar to *Bipolaris* group, and is beginning to be included in this group by experts. It is common in outdoor environment and can be found in soil, leaves, and plant debris. Indoors, *Curvularia* species can be found on any cellulose containing product, although it is relatively uncommonly amplified indoors. With water activity 0.80-0.85, *Curvularia* is considered to be a secondary colonizer, and can amplify anywhere there is condensation. *Curvularia* is thought to be a common allergen. Some people may experience hay fever, asthma and allergic fungal sinusitis. It may also cause corneal infections, onychomycosis or nail infection, pneumonia, and mycetoma, primarily in immunocompromised individuals.

***Epicoccum* -** Saprophytic fungus that occurs worldwide. Very commonly identified outdoors, but relatively uncommonly found amplified indoors. It is considered a common allergen but rarely causes systemic diseases in humans. With water activity of around 0.97, Epicoccum is very much a tertiary colonizer that requires significant water damage to propagate.

Erysiphe/Oidium - A group of two closely-related species of plant pathogens commonly found on leaves, stems, flowers, and fruits. They are sometimes referred to as "powdery" or "downy" mildew. Commonly identified outdoors, but uncommon to find indoors except on houseplants and fruits/vegetables.

Fusarium – A contaminant / opportunistic pathogen, found on fruit, grains and is common in soil. Commonly identified outdoors, rarely found amplified indoors. One of the most common fungal infection agents in hospitals and other places with immunocompromised people. With water activity of about 0.86, fusarium is a secondary colonizer, and can propagate in condensation.

***Ganoderma* –** Commonly called "shelf fungus", very commonly seen growing on tree trunks. Ganoderma are frequently used in traditional Asian medicines, and reishi mushroom tea is *Ganoderma* based. Very uncommon to find amplified indoors.

Helicomyces - This group includes genera Helicoma, Helicomyces, and Helicosporium, all of which are closely related helical-spored fungi. They are common on dead and decaying wood and bark lying on the ground. Fungi in the helicomyces group are not known human pathogens. Very, very rarely found amplified.

***Mucor* -** Characterized by rapid growth. Rare infections in severely debilitated patients have occurred (Mucorosis). Rarely identified in samples indoors or outdoors.

***Nigrosporum* -** Often found growing in soil and decaying plant material. It seldom found growing indoors. No report of mycotoxin production is known. Some people may experience hay fever and asthma if large numbers of spores are inhaled. Very rarely found in air samples indoors or outdoors in quantities of more than a spore or two.

Penicillium/Aspergillus Group - the two genera of mold *Penicillium* and *Aspergillus* cannot be distinguished in air samples, but can usually be separated in lift/swab samples due to their distinct hyphal morphologies. Please see the entry for each,

Penicillium - One of the most common fungal genera found worldwide with about 300 species. Commonly found in soil and decaying vegetation and indoors in dust, food, and various building materials. One of the most common molds found amplified indoors. Common bread mold is a species of Penicillium, as are many fruit molds. Spores usually cannot be distinguished from Aspergillus on non-cultured samples (like tape-lifts and air cassettes). It is reported to be allergenic, to cause certain infections in compromised individuals, and some species do produce toxins thought to be unhealthy to humans. With various species having water activities as low as 0.7 and as high as 0.85, *Penicillium* is a very common primary and secondary colonizer. Many species can grow in moist areas even without significant condensation.

Pithomyces – Saprophytic fungus, generally found outdoors on decaying plant material. Very common outdoors, especially in spring/summer. Very unlikely to be found indoors, except in severe water damage cases where the framing wood has rotted.

Pollen – Plant reproductive agent. Very common seasonal allergy trigger.

Rust - A plant pathogen that is commonly found on leaves, stems, fruits, and seeds of various plants. Rarely found amplified indoors except on certain houseplants.

Smut, Periconia, Myxomycetes – Similar genera commonly referred to as "slime molds", *Myxomycetes/Periconia* are among the few mold types that prefer colder climates to tropical climates. Fairly uncommon amplified indoors, but not unheard of, especially in buildings with extremely poor/no housekeeping. Some allergenic properties reported, but generally pose no health concerns to humans or animals. Smuts are ubiquitous parasitic plant pathogens, which require a living host to complete their life cycle and are not usually found growing indoors, other than indoor farms of the like. Smuts are most often found on corn, grass, weeds, flowering plants and other fungi; they are usually disseminated by wind. They are called smuts because they form black powdery spore masses that resemble soot or smut. *Myxomycetes/Periconia* are ubiquitous outdoor molds, and are commonly found in forested areas where bark, soil, dung, and leaf litter are present.

Stachybotrys – "Black mold". This organism is rarely found in outdoor samples, but is frequently found in indoor samples. It is one of the major contributors to "sick building" syndrome. It can produce a trichothecene mycotoxin, Satratoxin H, which is a poisonous by inhalation. Individuals with chronic exposure to the toxin reported cold and flu symptoms, sore throats, diarrhea, headaches, fatigue, dermatitis, intermittent local hair loss and generalized malaise. The toxins produced by this fungus can suppress the immune system affecting the lymphoid tissue and the bone marrow. With a water activity of 0.88, *Stachybotrys* is a tertiary colonizer, and requires active water damage in order to propagate. Stachybotrys is the most common fungus found on the cellulose outer faces of drywall, and is rare anywhere other than on drywall indoors.

Reference: Department of Environmental Health and Safety-Stachybotrys spp.
https://dehs.umn.edu/stachybotrys-spp

Spegazzinia – Saphrophytic fungus. Uncommon fungus, but spores are very large/distinctive, so one or two will be sometimes be identified in outdoor samples. Extremely rare to find any indoor amplification.

Stemphylium – A saprophytic fungus that generally infects certain crops such as carrot, tomato, asparagus, and soybeans. Uncommon to find outdoors in quantities of more than one of two, and very uncommon to find amplified indoors.

Torula - A common outdoor yeast-like mold that can be found on soil, dung, plant debris, sugar beet roots, oats, fresh and sea water. Rarely found amplified indoors. It produces simple or branched chains of dark spores which arise more or less directly from the vegetative hyphae. The spores are round, ellipsoidal or sub-spherical, brown or olivaceous in color. Dried torula is a common food additive used for its "smoky, umami" flavor.

Ulocladium – Very similar to *Alternaria*, many references now include *Ulocladium* with *Alternaria*. *Ulocladium* is saprophytic and is found both outdoors and indoors, with indoor amplification not uncommon. With water activity of 0.89 to 0.90, it is a late secondary/early tertiary colonizer, and generally requires active water intrusion to propagate. *Ulocladium* is considered on of, if not the, most allergenic molds, with *Ulocladium botrytis* in common use in skin-prick tests for mold allergies.

Quick Guide:

Spore Name	Indoor	Outdoor	Ubiquitous
Acremonium		X	
Alternaria			X
Ascospore		X	
Aspergillus			X
Basidiospore		X	
Bipolaris+			X
Chaetomium	X		
Cladosporium			X
Curvularia			X
Epicoccum			X
Erysiphe/Oidium		X	
Fusarium		X	
Ganoderma		X	
Geotrichum		X	
Helicomyces		X	
Mucor		X	
Nigrospora		X	
Pen/Asp Group			X
Penicillium			X
Pollen		X	
Rust		X	
Smut/Periconia/Myxo			X
Stachybotrys	X		
Stemphylium		X	
Torula		X	
Ulocladium			X

Indoor – Spores primarily found indoor only. While obviously all molds present inside come from outside originally, these spores are rarely found in outdoor air samples.

Outdoor – Spores primarily found outdoors only. While these spores can be found inside in small quantities from having blown in, they will rarely be found amplified inside except in cases of water damage severe enough that the framing wood has become rotten.

Ubiquitous – Spores commonly found both outside and amplified inside.

Do I have mold?

Easy question, harder to answer. Unless you live in a certified clean room, you have mold spores all around you. Your household dust is likely at least 5% mold spores. The vast majority of people (other than the immunocompromised) do not have any reaction whatsoever beyond minor occasional allergies to normal mold levels.

The real question is: Do I have significantly more or different molds inside than outside? The main goal of any mold survey is to identify any particular amplification of mold indoors. Amplification refers to a mold that is present indoors at 10x, 100x, even 1000x more than outdoors, which strongly implies indoor growth. Zero mold is not a reasonable goal. Even with absolutely perfect housekeeping, you are letting tens of thousands of mold spores in every time you open your front door in mid-summer. When looking at your spore trap results, make sure you are looking not only at the total spore concentration, but also checking for any mold types present indoor in significant numbers that are not present outside, or in very small quantities outside.

Why do I have mold, and what should I do?

All mold requires three things to grow: an organic food source, an appropriate amount of water, and an acceptable temperature. It is not reasonable to try to eliminate all household organic food sources nor to make the household temperature too hot or cold for molds. Therefore, the controllable “cause” is water/moisture. The mold was able to propagate because of the presence of extremely humid conditions, small condensation pools, or active water damage, depending on the type of mold. Therefore, the solution is to take care of the water issue. Depending on the severity, this may be a major rebuild to take care of foundation leaks, replacing doors and windows, fixing gutters and/or water piping, or just running a dehumidifier. A professional with a moisture meter can give you a good idea of the severity you’re likely facing, and possible solutions.

While cleaning up the currently present mold with bleach or an antifungal of some type is also important, it must be paired with a correction to the moisture issue, or the mold will just recur.

Should I be worried?

Nobody other than your physician can give you any medical advice of any kind. Rest assured you are not the first person to have an indoor mold problem, and most of time the situation ends up resolved with no major known consequences. Looking around the internet will introduce you to a variety of scaremongers who will tell you every health problem you have is from mold, and only they have the solution. You will also find people who will tell you that everything mold is overblown, if you have a working immune system you won't have any issues, and mold remediation is just an insurance scam.

The truth is, we don't really know. Whereas you can say, for example, that asbestos definitively causes mesothelioma and asbestosis, there does not exist that simple equivalency for environmental mold. There are a wealth of stories of ill health effects from mold, but the related science is lacking. Most species of mold have not been extensively studied for health effects, and those that have are mostly focused on hospitals and immunocompromised individuals, not the home/office environment with generally healthy people. Many molds are known to have the ability to produce certain mycotoxins, but we don't really have a good idea of what chemicals any particular mold in the home situation is going to make or not make based on the nature of the food, amount of water, other species present, etc. There are just too many variables. That said, it is very unlikely that any mold present in your house is providing you benefit, so there is no risk (other than financial) to removing the mold, fixing the water issue, and seeing if you feel better.

But again, nobody other than your physician can provide medical advice of any kind. If you want answers to whether your house is safe to inhabit, whether children should leave for the duration of the work, or anything else similar, those questions can only be answered by a medical professional.