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September 7, 2023

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**RE: Mold Indoor Air Quality Sampling  
Lundahl Middle School – Library**

Pepper Environmental Technologies, Inc. (PET) conducted a mold air sampling study for Pepper Construction Company at Crystal Lake Elementary School District 47's Lundahl Middle School, located at 560 Nash Road in Crystal Lake, Illinois. The sampling was performed on September 5, 2023. Mold air samples were collected inside of the Library. Control samples were collected within the building's main Cafeteria as well as Outdoors, for comparison purposes.

The mold sampling was conducted using a Calibrated High Volume Air Sampling Pump and Air-O-Cell cassettes. All samples were collected at 15 liters per minute rate for 5 minutes. All samples were transported to EMSL Analysis, Hillside, Illinois for 24-hour turnaround time (TAT) laboratory analysis.

The primary purpose of the sampling was to determine mold spore concentrations within the Library. Mold spores are like microscopic seeds. Virtually all molds produce spores. Each species of mold produces spores that are unique to its species. This morphology is used to identify and, in the case of air samples, identify the mold specie types and quantities that might be present. Spores are found both indoors and outdoors.

Currently there are no federal, state, or local standards regulating exposure to molds. In lieu of any standard, samples are usually evaluated in one of two ways. The first is by comparing the total airborne concentration of spores found inside the area of concern to those found outdoors or, within a control area inside the building, away from the area of concern. Typically, "inside" concentrations are less than the outdoor control sample concentrations. If the opposite occurs, it may be an indication of a concern. The second method is to evaluate the genus/species of the mold spores identified. This is typically done for both air and surface samples. In general, airborne mold specie types identified inside a building should be similar to those found on the control sample. If significant variations are observed, it may also be an indication of a potential mold problem.

Please see the results from this study on the next page and in the attached laboratory report.

## RESULTS

<b>AREA / ROOM SAMPLED</b>	<b>TOTAL FUNGAL SPORE COUNTS</b>	<b>SPORE COUNTS PER CUBIC METER OF AIR</b>	<b>IDENTIFICATIONS</b>
LMSL-1 IWA, Library/LMC Center West	45	1670	<i>Alternaria,</i> <i>Aspergillus/Penicillium,</i> <i>Basidiospores, Cladosporium,</i> <i>Epicoccum, Rust, Unidentifiable</i> <i>Spores (Unidentifiable Sp.)</i>
LMSL-2 IWA, Library/LMC Adj. Entrance	32	1320	<i>Alternaria,</i> <i>Aspergillus/Penicillium,</i> <i>Basidiospores, Cladosporium,</i> <i>Epicoccum, Pithomyces, Rust,</i> <i>Unidentifiable Sp.</i>
LMSL-3 OWA, Cafeteria Control Sample	78	3190	<i>Alternaria,</i> <i>Aspergillus/Penicillium,</i> <i>Basidiospores, Cladosporium,</i> <i>Ganoderma, Myxomycetes,</i> <i>Rust, Unidentifiable Sp.,</i> <i>Cercospora</i>
LMSL-4 Outdoors, Southeast of Building	473	20130	<i>Alternaria, Ascospores,</i> <i>Aspergillus/Penicillium,</i> <i>Basidiospores, Chaetomium,</i> <i>Cladosporium, Epicoccum,</i> <i>Ganoderma, Myxomycetes,</i> <i>Pithomyces, Unidentifiable Sp,</i> <i>Blakeslea/Choanephora,</i> <i>Cercospora, Paecilomyces</i>
LMSL-5 Outdoors, NW of Building	441	19140	<i>Alternaria, Ascospores,</i> <i>Aspergillus/Penicillium,</i> <i>Basidiospores, Cladosporium,</i> <i>Epicoccum, Fusarium,</i> <i>Ganoderma, Myxomycetes,</i> <i>Pithomyces, Rust, Unidentifiable</i> <i>Sp., Cercospora</i>



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## **CONCLUSIONS AND RECOMMENDATIONS**

There are no governmental standards for acceptable levels of mold spores. The American Conference of Governmental Industrial Hygienists (ACGIH) agrees that levels from 500 to 1,000 spores per cubic meter of air (sp/m<sup>3</sup>) could be a concern to those individuals that have a compromised respiratory system. Mold spore concentrations collected from inside the Library during this study ranged from 1,320 to sp/m<sup>3</sup> to 1,670 sp/m<sup>3</sup>. The control sample results, collected Cafeteria for comparison purposes, were 3,190 sp/m<sup>3</sup>. Outdoor mold spore concentrations at the time of this study ranged from 19,140 to sp/m<sup>3</sup> to 20,130 sp/m<sup>3</sup>.

At the time of air testing, no moldy or musty odors were noted in the areas sampled. Visual inspections at the time of testing did not show signs of moisture, standing water or water infiltration. All air samples collected in the Library showed lower total spore counts than the outdoor and control area concentrations, which is a normal finding. The mold specie types found inside the Library during this study were also similar to the specie types found on the outdoor samples, which is also a normal finding.

The average mold spore concentrations within the Library were 1,495 sp/m<sup>3</sup>. The average outdoor mold spore concentrations were 19,635 sp/m<sup>3</sup>. The average mold spore concentrations found outdoors were over 13 times higher than the Library average during the time of this study.

Based on the air monitoring results obtained at the time of this study, the Library at Lundahl Middle School does not appear to harbor an active mold-growth reservoir. Please find the attached laboratory report for your records.

If you have any questions, please let us know.

Sincerely,

A black rectangular redaction box covers the signature of Steve Soloma.

Pepper Environmental Technologies. Inc.  
Steve Soloma  
Senior Project Manager



# EMSL Analytical, Inc.

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**EMSL Order:** 262308013  
**Customer ID:** PEPE25  
**Customer PO:**  
**Project ID:**

**Attention:** Steve Soloma  
Pepper Environmental  
411 Lake Zurich Road  
Barrington, IL 60010


**Phone:** (630) 710-3834  
**Fax:**  
**Collected Date:** 09/05/2023  
**Received Date:** 09/05/2023 04:55 PM  
**Analyzed Date:** 09/06/2023

**Project:** 2301502AAA/9CC D47 LMS LIBRARY 1AQ

### Test Report: Air-O-Cell™ Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L): Sample Location:	262308013-0001 LMSL-1 75 IWA-LMC CENTER			262308013-0002 LMSL-2 75 IWA-@LMC WEST ENTRANCE			262308013-0003 LMSL-3 75 OWA - CAFETERIA		
	Spore Types	Raw Count	Count/m <sup>3</sup>	% of Total	Raw Count	Count/m <sup>3</sup>	% of Total	Raw Count	Count/m <sup>3</sup>
Alternaria (Ulocladium)	7*	90*	5.4	2	90	6.8	4*	50*	1.6
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium	17	740	44.3	17	740	56.1	17	740	23.2
Basidiospores	7	300	18	1	40	3	11	480	15
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium++	-	-	-	-	-	-	-	-	-
Cladosporium	11	480	28.7	7	300	22.7	38	1700	53.3
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	1*	10*	0.6	2*	30*	2.3	-	-	-
Fusarium++	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	2	90	2.8
Myxomycetes++	-	-	-	-	-	-	1*	10*	0.3
Pithomyces++	-	-	-	1	40	3	-	-	-
Rust	1	40	2.4	1	40	3	1*	10*	0.3
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	1*	10*	0.6	1	40	3	3	100	3.1
Zygomycetes	-	-	-	-	-	-	-	-	-
Blakeslea/Choanephora	-	-	-	-	-	-	-	-	-
Cercospora++	-	-	-	-	-	-	1*	10*	0.3
Paecilomyces++	-	-	-	-	-	-	-	-	-
<b>Total Fungi</b>	<b>45</b>	<b>1670</b>	<b>100</b>	<b>32</b>	<b>1320</b>	<b>100</b>	<b>78</b>	<b>3190</b>	<b>100</b>
Hypthal Fragment	3*	40*	-	1	40	-	1	40	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	2	90	-	3*	40*	-	1*	10*	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	3	-	-	3	-	-	3	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	2	-	-	1	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.

  
Andrei Poluchowicz, Microbiology Technical Manager  
or other Approved Signatory

No discernable field blank was submitted with this group of samples.

Skin Fragment and Fibrous Particulate ratings are based on the percent of non-fungal material they represent: 1 (1-25%), 2 (26-50%), 3 (51-75%), or 4 (76-100%). Background ratings are based on the total area covered by non-fungal particles: 1 (1-25%), 2 (26-50%), 3 (51-75%), 4 (76-99%), or 5 (100%; overloaded, prohibiting accurate detection and quantification). High levels of background will obscure spores and other particulates, leading to underestimation. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. \*\*\* Denotes particles found at 300X. \*- Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above, and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. When the information supplied by the customer can affect the validity of the result, it will be noted on the report.

Samples analyzed by EMSL Analytical, Inc. Hillside, IL AIHA LAP, LLC-EMLAP Accredited #102992

Initial report from: 09/06/2023 04:31 PM

For information on the fungi listed in this report, please visit the Resources section at [www.emsl.com](http://www.emsl.com)



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### Test Report: Air-O-Cell™ Analysis of Fungal Spores & Particulates by Optical Microscopy (Methods MICRO-SOP-201, ASTM D7391)

Lab Sample Number: Client Sample ID: Volume (L): Sample Location:	262308013-0004 LMSL-4 75 OUTDOORS, SE OF BLDG			262308013-0005 LMSL-5 75 OUTDOORS, NW OF BLDG					
	Spore Types	Raw Count	Count/m³	% of Total	Raw Count	Count/m³	% of Total		
Alternaria (Ulocladium)	8	300	1.5	21	920	4.8	-	-	-
Ascospores	8	300	1.5	17	740	3.9	-	-	-
Aspergillus/Penicillium	24	1000	5	21	920	4.8	-	-	-
Basidiospores	76	3300	16.4	75	3300	17.2	-	-	-
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium++	1*	10*	0	-	-	-	-	-	-
Cladosporium	319	13900	69.1	289	12600	65.8	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	3*	40*	0.2	1	40	0.2	-	-	-
Fusarium++	-	-	-	1*	10*	0.1	-	-	-
Ganoderma	2	90	0.4	2	90	0.5	-	-	-
Myxomycetes++	1	40	0.2	3	100	0.5	-	-	-
Pithomyces++	1*	10*	0	1	40	0.2	-	-	-
Rust	-	-	-	1	40	0.2	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	3	100	0.5	1	40	0.2	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Blakeslea/Choanephora	3*	40*	0.2	-	-	-	-	-	-
Cercospora++	16	700	3.5	8	300	1.6	-	-	-
Paecilomyces++	8	300	1.5	-	-	-	-	-	-
<b>Total Fungi</b>	<b>473</b>	<b>20130</b>	<b>100</b>	<b>441</b>	<b>19140</b>	<b>100</b>	-	-	-
Hyphal Fragment	2	90	-	6	300	-	-	-	-
Insect Fragment	1*	10*	-	-	-	-	-	-	-
Pollen	-	-	-	5	200	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	-	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	-	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	-	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	-	-
Background (1-5)	-	2	-	-	1	-	-	-	-

++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.



Andrei Poluchowicz, Microbiology Technical Manager  
or other Approved Signatory

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