

Crystal Lake School District 47
Richard Bernotas Middle School
Crystal Lake, IL 60014
Mold Indoor Air Quality Study
Rooms 35, 42, Girls' Locker Room &
Girls' Pe Office

PREPARED FOR:

David Schuh
Crystal Lake Elementary School District 47 |
Director of Operations
221 Liberty Rd, Crystal Lake, IL 60014
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PREPARED ON: April 25, 2025

PREPARED BY:

Pepper Environmental
Technologies, Inc.
411 Lake Zurich Road
Barrington, Illinois 60010

Contents

1.	INTRODUCTION.....	2
2.	SAMPLING	2
3.	FINDINGS / AIR-O-CELL TEST RESULTS	2
4.	METHODOLOGIES / SUMMARY OF RESULTS.....	3
5.	CONCLUSION.....	4

1. INTRODUCTION

Pepper Environmental Technologies, Inc. (PET) is pleased to provide you with this letter summarizing the laboratory results from the indoor air quality testing for mold/fungus spores at Richard Bernotas Middle School, located at 170 N Oak St, Crystal Lake, Illinois 60014.

This study was performed on Thursday April 17, 2025. The building was occupied during the time of the study. Mold air samples were collected in Rooms 35, 42, Girls' Locker Room, and Girls' PE Office. Samples were also collected outdoors, for comparison purposes.

2. SAMPLING

The mold air sampling was conducted using a Calibrated High Volume Air Sampling Pump (Zefon Bio Pump Plus) and Air-O-Cell cassettes. Both indoor and outdoor samples were collected. All samples were collected at a flow rate of 15 liters per minute at a rate of 5 minutes each. Samples were hand delivered under a chain of custody to EMSL Laboratories in Hillside, Illinois, for laboratory analysis. The laboratory results can be found in Attachment A.

The primary purpose of the sampling was to determine mold spore concentrations within Rooms 35, 42, the Girls' Locker Room and the Girls' PE Office. 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 the mold specie types and quantities that may be present. Mold spores are found both indoors and outdoors.

Currently there are no federal, state, or local standards regulating exposure to molds. Mold air sample results from this study can be found on the following pages and in the attached laboratory report.

3. FINDINGS / AIR-O-CELL TEST RESULTS

AREA / ROOM SAMPLED	TOTAL FUNGAL SPORES RAW COUNTS	SPORE COUNTS PER CUBIC METER OF AIR	IDENTIFICATIONS
1 Room 35	50	2110	<i>Alternaria, Ascospores, Aspergillus/Penicillium, Basidiospores, Cladosporium</i>
2 Girls' Locker Room	6	300	<i>Aspergillus/Penicillium</i>

AREA / ROOM SAMPLED	TOTAL FUNGAL SPORES RAW COUNTS	SPORE COUNTS PER CUBIC METER OF AIR	IDENTIFICATIONS
3 Girls' PE Office	6	290	<i>Aspergillus/Penicillium, Basidiospores, Cladosporium</i>
4 Room 42	10	430	<i>Aspergillus/Penicillium, Basidiospores, Cladosporium</i>
5 Outdoors, Main Entrance Side (South Side) of Building	64	2700	<i>Aspergillus/Penicillium, Basidiospores, Bipolaris, Cladosporium, Curvularia, Myxomycetes</i>
6 Outdoors, Back Side (North Side) of Building	60	2480	<i>Alternaria, Aspergillus/Penicillium, Basidiospores, Cladosporium, Unidentifiable Spores, Nigrospora</i>

4. METHODOLOGIES / SUMMARY OF RESULTS

Currently, there are no governmental standards for acceptable levels of mold spores. In lieu of any standard, mold air samples are usually evaluated in one of two ways. The first is by comparing the total airborne concentration of spores found inside the building to those found outside the building. Typically, inside concentrations are less than outdoor 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. In general, airborne mold specie-types identified inside a building should be similar to those found outside the building. If significant variations are observed, it may also be an indication of a potential concern.

Mold concentrations found indoors during this study ranged from 290 to 2110 spores per cubic meter of air (sp/m³). The outdoor comparison samples ranged from 2480 to 2700 sp/m³. The highest indoor concentrations were found in Room 35 at a concentration of 2110 sp/m³.

The mold specie-types found on the indoor samples during this study are similar to those found on the outdoor samples. According to the Centers for Disease Control (CDC), the most common indoor molds specie-types are *Cladosporium* and *Aspergillus/Penicillium*. These specie-types can also be found outdoors. The National Institute of Health reports the *Aspergillus* species is a

ubiquitous mold which can be found in many structures. Some literature suggests that airborne spores should generally be less than 1,500 sp/m³ and suggests that *Aspergillus/Penicillium* spores be on average less than 700 sp/m³. *Ascospore* concentrations of over 5,000 sp/m³ may be of a concern to a susceptible population.

Some of the above-referenced specie-types were above their associated theoretical thresholds. *Cladosporium* concentrations found in Room 35 were 700 sp/m³, which is higher than the outdoor concentrations. *Aspergillus/Penicillium* concentrations found in Room 35 were 1000 sp/m³, which is equal to the concentrations found outdoors on the Main Entrance side of the building.

5. CONCLUSION

At the time of air testing, no musty or damp odors and no standing water were noted in the test locations. In general, the mold specie types found inside the building during this study were similarly present in the specie types found outdoors, which is a normal finding. Indoor total concentrations were also lower than the outdoor total concentrations, which is also a normal finding. However, mold concentrations are elevated in Room 35 when compared to the rest of the indoor test locations. Room 35 is near the main entrance doors of the building and could be drawing-in more outside air compared to the other indoor test locations, which might explain this discrepancy. Though the total concentrations in Room 35 are lower than the outdoor total concentrations, PET recommends steam cleaning the carpets in Room 35 and verifying above ceiling conditions for signs of any moisture collection.

Please find the attached Laboratory Report (Attachment A), and Sample Location Maps (Attachment B) outlining the mold air sampling results and sampling locations, respectively. PET's Environmental Credentials can be found in Attachment C.

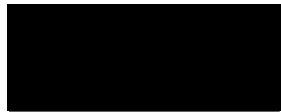
PET appreciates the opportunity to perform this study for Crystal Lake Elementary School District 47. If you have any questions or concerns, please do not hesitate to contact us.

Sincerely,

PEPPER ENVIRONMENTAL TECHNOLOGIES, INC.



Steve Soloma, PM-ASP
Senior Project Manager



Michael J. Grant, CIEC, CMI
Vice President

ATTACHMENT A

ANALYTICAL LABORATORY RESULTS



EMSL Analytical, Inc.

4140 Litt Drive Hillside, IL 60162
Tel/Fax: (773) 313-0099 / (773) 313-0139
<http://www.EMSL.com> / chicagolab@emsl.com

EMSL Order: 262503333
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: 04/17/2025
Received Date: 04/17/2025 09:15 AM
Analyzed Date: 04/23/2025

Project: 2400913 III

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:	262503333-0001			262503333-0002			262503333-0003		
	1	2	3	75	75	75	ROOM 35	GIRLS LOCKERS RM	GIRLS PE OFFICE
Spore Types	Raw Count†	Count/m³	% of Total	Raw Count†	Count/m³	% of Total	Raw Count†	Count/m³	% of Total
Alternaria (Ulocladium)	1	10*	0.5	-	-	-	-	-	-
Ascospores	3	100	4.7	-	-	-	-	-	-
Aspergillus/Penicillium++	24	1000	47.4	6	300	100	4	200	69
Basidiospores	6	300	14.2	-	-	-	2	90	31
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium++	-	-	-	-	-	-	-	-	-
Cladosporium	16	700	33.2	-	-	-	-	-	-
Curvularia	-	-	-	-	-	-	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium++	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	-	-	-	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	-	-	-
Total Fungi	50	2110	100	6	300	100	6	290	100
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	3	-	-	3	-	-	3	-
Fibrous Particulate (1-4)	-	2	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

† Due to method stopping rules, extrapolated raw counts are reported in parenthesis.
++ 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.

EMSL Analytical, Inc. 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 Analytical, Inc. EMSL Analytical, Inc. bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. Samples are within quality control criteria and met method specifications unless otherwise noted. 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). High levels of background particulate can obscure spores and other particulates, leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. 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 >= 100 are extrapolated based on the percentage analyzed.

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

Initial report from: 04/23/2025 02:30 PM

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com



EMSL Analytical, Inc.

4140 Litt Drive Hillside, IL 60162
Tel/Fax: (773) 313-0099 / (773) 313-0139
<http://www.EMSL.com/chicagolab@emsl.com>

EMSL Order: 262503333
Customer ID: PEPE25
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Attention: Steve Soloma
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Project: 2400913 III

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:	262503333-0004			262503333-0005			262503333-0006		
	Raw Count†	Count/m³	% of Total	Raw Count†	Count/m³	% of Total	Raw Count†	Count/m³	% of Total
	ROOM 42			OUTDOORS MAIN ENT SIDE OF BLDG			OUTDOORS BACK SIDE OF BLDG		
Spore Types									
Alternaria (Ulocladium)	-	-	-	-	-	-	2	30*	1.2
Ascospores	-	-	-	-	-	-	-	-	-
Aspergillus/Penicillium++	7	300	69.8	36	1600	59.3	45	2000	80.6
Basidiospores	2	90	20.9	24	1000	37	8	300	12.1
Bipolaris++	-	-	-	1	40	1.5	-	-	-
Chaetomium++	-	-	-	-	-	-	-	-	-
Cladosporium	1	40	9.3	1	40	1.5	3	100	4
Curvularia	-	-	-	1	10*	0.4	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium++	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	-	-	-	1	10*	0.4	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	1	40	1.6
Zygomycetes	-	-	-	-	-	-	-	-	-
Nigrospora	-	-	-	-	-	-	1	10*	0.4
Total Fungi	10	430	100	64	2700	100	60	2480	100
Hyphal Fragment	-	-	-	-	-	-	1	10*	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	2	30*	-	1	40	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	3	-	-	1	-	-	1	-
Fibrous Particulate (1-4)	-	2	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

† Due to method stopping rules, extrapolated raw counts are reported in parenthesis.
++ Includes other spores with similar morphology; see EMSL's fungal glossary for each specific category.



Andrei Poluchowicz, Microbiology Technical Manager
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Initial report from: 04/23/2025 02:30 PM

For information on the fungi listed in this report, please visit the Resources section at www.emsl.com



Microbiology Chain of Custody Form

EMSL Order Number / Lab Use Only

EMSL Analytical, Inc.
200 Route 130-North
Cinnaminson, NJ 08077

262503333

PHONE: (800) 220-3675

EMAIL: CinnMicroLab@emsl.com

EMSL ANALYTICAL, INC.
TESTING LABS • PRODUCTS • TRAINING

Customer Information	Customer ID:	PEPE 025		Billing Information	Billing ID:			
	Company Name:	Pepper Env. Tech Inc			Company Name:			
	Contact Name:	Steve Soloma			Billing Contact:			
	Street Address:	411 Lake Zurich Rd			Street Address:			
	City, State, Zip:	Barrington, IL 60010	Country:		USA	City, State, Zip:		
	Phone:	630-740-3834			Phone:			
Email(s) for Report:	Soloma@peppereenvironmental.com		Email(s) for Invoice:					

Project Name/No:		2400913TII		Purchase Order:	
EMSL LIMS Project ID:	State Samples Collected:	Zip Code Samples Collected:	State of Connecticut (CT) must select project location:		
(If applicable, EMSL will provide)	IL	60014	<input type="checkbox"/> Commercial (Taxable)	<input type="checkbox"/> Residential (Non-taxable)	
Sampled By Name:	Sampled By Signature:		No. of Samples in Shipment:		6
Steve Soloma	[Signature]				

Sterile, Sodium Thiosulfate Preserved Bottle Used: **Rigide Used in Source (specify)**

Public Water Supply Samples: **Note: All results may automatically be reported to DOH if required by State.**

Turn-Around-Time (TAT) Please call ahead for large projects and/or turnaround times 6 Hours or Less. *32 Hour TAT available for select tests only, samples must be submitted by 11:30am.

3 Hour
 6 Hour
 24 Hour
 32* Hour
 48 Hour
 72 Hour
 96 Hour
 1 Week
 2 Week

MICROBIOLOGY TEST CODES			
M001 Ab-Q-Cell	M174 MoldSnap	M012 Pseudomonas aeruginosa (PIA***)	M115 Sewage Screen - Water (PIA***)
M030 MICRO 5	M032 Allergenco-D	M024 Pseudomonas aeruginosa (MFT*)	M116 Sewage Screen - Water (MPN**)
M041 Fungal Direct Examination		M015 Heterotrophic Plate Count	M117 Sewage Screen - Swab (PIA***)
M169 Pollen ID & Enumeration		M017 Total Coliform & E. Coli (Colilert PIA***)	M013 Sewage Screen - Swab (MFT*)
M280 Dust Characterization Level-1		M018 Total Coliform & E. Coli (MFT*)	M730 Methicillin-resistant Staph. aureus (MRSA)
M281 Dust Characterization Level-2		M114 Total Coliform & E. Coli Enumeration (Colilert MPN**)	M031 Rapid-growing non-TB Mycobacteria Detection & Enumeration
M005 Viable Fungi-Air Samples (Genus ID & Count)		M019 Fecal Coliform (MFT*)	M014 Endotoxin Analysis
M006 Viable Fungi-Air Samples (Includes Penicillium, Aspergillus, Cladosporium, Stachybotrys Species ID & Count)		M029 Enterococci (MFT*)	M044 Group Allergen (Cat, Dog, Cockroach, Dust Mite)
M007 Culturable Fungi-Surface Samples (Genus ID & Count)		M129 Enterococci (Enterolert PIA***)	M095 Bacteroides
M008 Culturable Fungi-Surface Samples (Includes Penicillium, Aspergillus, Cladosporium, Stachybotrys Species ID & Count)		M180 Real Time qPCR-ERMI 36 Panel	Other - See Analytical Price Guide for Test Code
M009 Bacteria Culture Gram Stain & Count		M025 Sewage Screen - Water (MFT*)	Legionella Analysis Please use EMSL Legionella COC
M010 Bacteria Count & ID - 3 Most Prominent			
M011 Bacteria Count & ID - 5 Most Prominent			

Sample #	Sample Location/Description	Sample Type (Matrix)	Potable / Non-Potable (Only for Water)	Test Code	Volume/Area	Date / Time Collected	Temperature (Lab Use Only)
Example: Sample 1	Kitchen	Water	Potable	M017	1,000 ml	1/1/2021 3:30pm	
1	Room 35	Air	---	M001	75L	4/17/25 ~6:30AM	
2	Girls Locker Rm		---		75L	~6:25AM	
3	Girls PE office		---		75L	~6:40	
4	Room 42		---		75L	~6:55	
5	Outdoors, mainent side of bldg		---		75L	~7:00	
6	Outdoors, back side of bldg		---		75L	~7:05	

Special Instructions and/or Regulatory Requirements (Sample Specifications, Processing Methods, Limits of Detection, etc.)

Method of Ship:		Relinquished by:		Received by:	
		Date/Time:	4/17/25	Date/Time:	4/17/25 9:15am

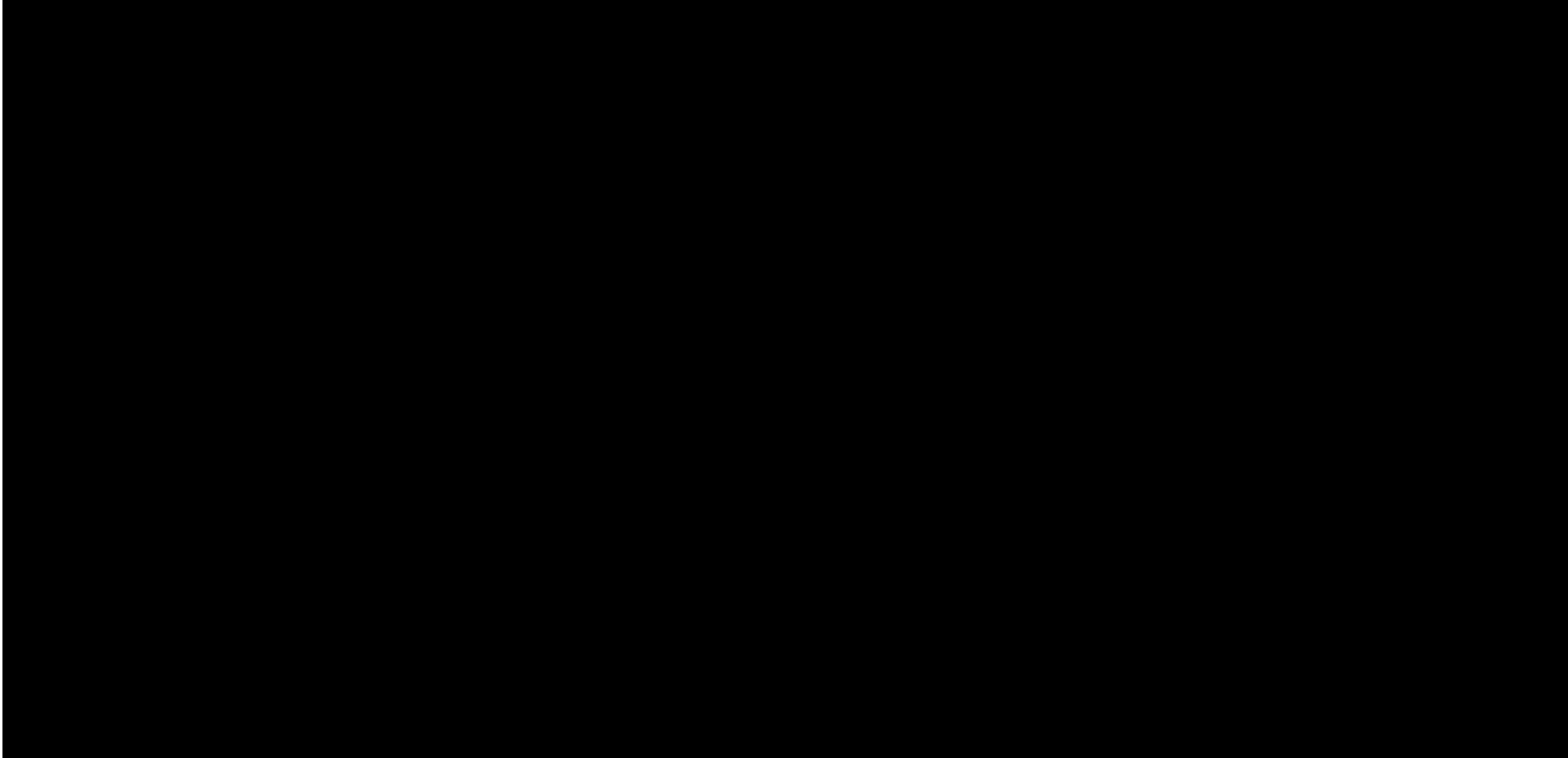
ATTACHMENT B

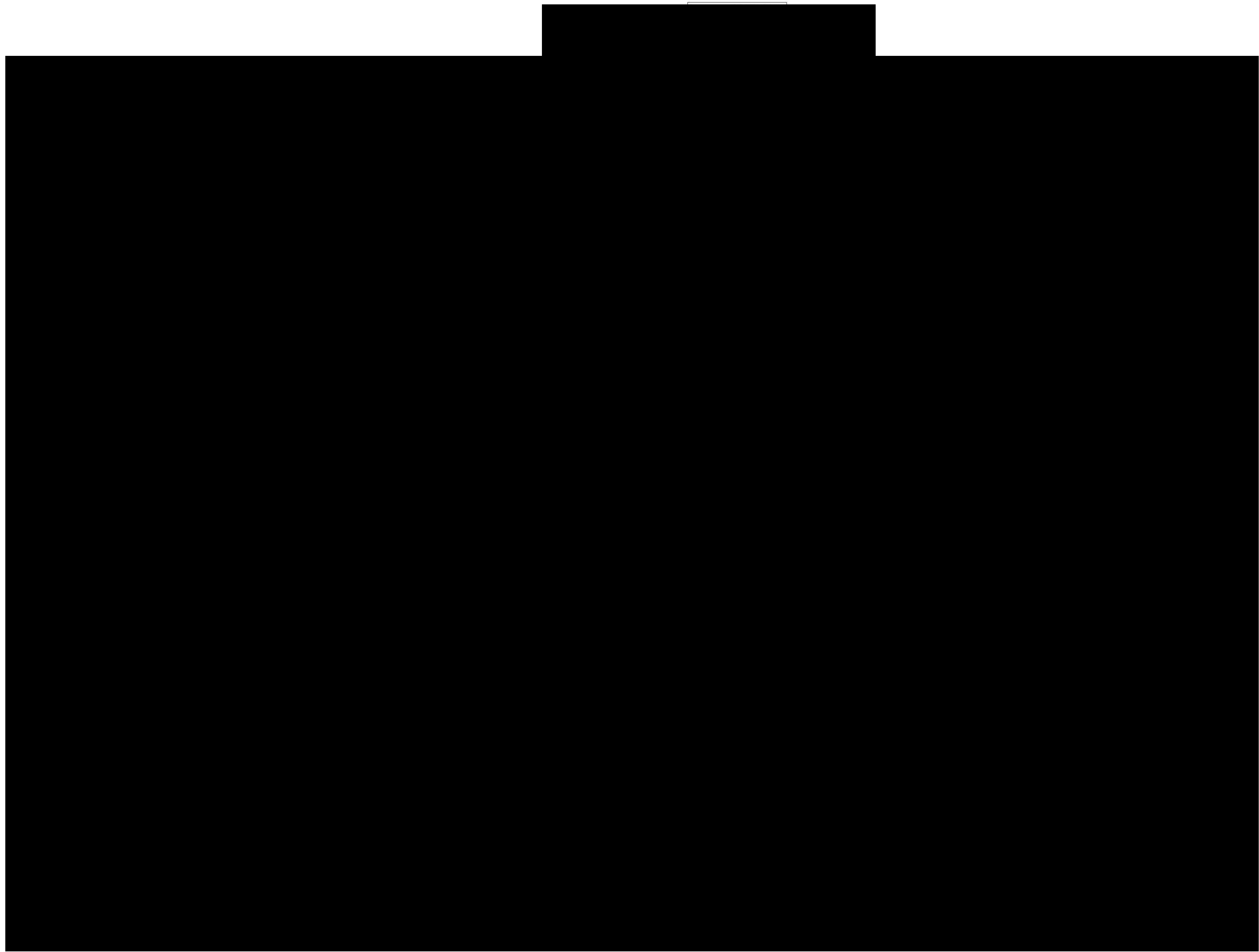
SAMPLE LOCATIONS



7

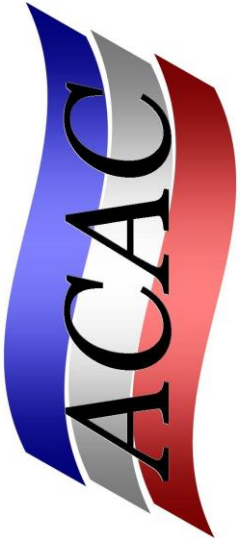
8





ATTACHMENT C

ENVIRONMENTAL CREDENTIALS



American Council for Accredited Certification

hereby certifies that

Michael J. Grant

has met all the specific standards and qualifications of the re-certification process,
including continued professional development, and is hereby re-certified as a



**Council-certified
Indoor Environmental Consultant**

This certificate expires on August 31, 2025

1108018

Certificate Number

This certificate remains the property of the American Council for Accredited Certification.

CERTIFICATE OF COMPLETION

THIS CERTIFICATE DEMONSTRATES THAT

MICHAEL GRANT

COMPLETED THE FOLLOWING COURSE TAUGHT BY INDOOR SCIENCES INC.:

CERTIFIED MICROBIAL INVESTIGATOR (CMI)

THE COURSE WAS ATTENDED ON **AUGUST 20 – 21, 2012** AND
INCLUDED **16 HOURS** OF INDOOR AIR QUALITY TRAINING.



IndoorSciences



IAN CULL, PE, CIEC
PRESIDENT
INDOOR SCIENCES, INC.

8/22/2012

DATE