

**DATE:** April 16, 2019

**TO:** Joanie Finch, Principal

**SUBJECT:** Arbor Creek MS - IAQ - Air Test Results - Room 112

On Thursday 4/11, Ensolum LLC Air tested Room 112. It is typically assumed that indoor spore levels in an area with filtered or air-conditioned air, and activity levels associated with school's average below the outdoor levels. Data from the airborne fungi sampling indicated that the total indoor concentration of mold/fungi in Room 112, was **5.4%** of the outdoor levels. Utilizing this theory, the indoor concentrations are well within the acceptable guidelines for areas with filtered air or air conditioning. If you have any questions, please call me.

Thanks,  
Paul

Paul Siddall  
Maintenance Energy Auditor (IAQ)  
Facility Services  
Lewisville ISD  
340 Lake Haven Rd  
Lewisville, TX 75057



# ENSOLUM

April 23, 2019

Lewisville Independent School District  
340 Lake Haven  
Lewisville, Texas 75057  
Attn: Mr. Paul Siddall

Re:

Limited Mold Assessment  
Arbor Creek Middle School – Room 112  
2109 Arbor Creek Drive  
Carrollton, Texas  
Ensolum Project No. 01A.1288.017

Ensolum, LLC (Ensolum) was retained to perform limited mold assessment services within Room 112 of the Arbor Creek Middle School located at 2109 Arbor Creek Drive in Carrollton, Texas. Enclosed is the report, including analytical data.

Ensolum appreciates this opportunity to be of service and looks forward to our continued work together. Please contact the undersigned with any questions or concerns you may have.

Sincerely,

Tod L. McLellan, MAC  
Mold Assessment License: MAC1361  
Exp. Date: 03/08/2020

Darren G. Bowden  
Principal  
MAC0321 EXP: 2/15/202

## 1.0 INTRODUCTION

Ensolum was retained by Mr. Paul Siddall, LISD, to complete a Limited Mold Assessment of Room 112 within Arbor Creek Middle School addressed at 2109 Arbor Creek Drive, Carrollton, Texas. The purpose of this investigation was to determine if elevated concentrations of airborne fungal spores and structures were present within the above-referenced room.

Mr. Tod McLellan completed the on-site investigation on April 11, 2019. The Limited Mold Assessment was performed in response to a complaint of possible indoor air quality issues within the classroom.

## 2.0 PROCEDURE

Ensolum visually inspected accessible areas of the office. Visible water damage was observed in the following locations:

VISIBLE WATER DAMAGE		
LOCATION	DATE	EXPLANATION
Room 112	4-11-2019	Desktop (currently dry)

It is possible that water-damaged building materials are present within the adjacent areas but were not reasonably accessible due to access limitations.

Following the inspection of potential water-damaged building materials, Ensolum conducted a moisture investigation in the identified areas to determine if nonvisible water-damaged materials and other building materials within the investigation area were present. The moisture investigation was completed with a GE Protimeter BLD5364 moisture meter on accessible porous and semi-porous building materials in each area of concern. At the time of investigation, monitored building materials did not exhibit elevated moisture concentrations in comparison with similar and non-affected building materials in the structure and standard scientific guidelines.

Representative Relative Humidity readings were collected and recorded using a Vaisala HM40 Humidity and Temperature Meter. Measurements recorded during the investigation are listed in the chart below:

TEMPERATURE, RELATIVE HUMIDITY & SPECIFIC HUMIDITY				
LOCATION	DATE	Temperature: F	Relative Humidity	Specific Humidity
Room 112	4-11-2019	69.6°	43.6%	46.99
Outdoor (West)	4-11-2019	64.2°	46.0%	41.08
Outdoor (South)	4-11-2019	61.3°	49.7%	40.03

Area air samples were collected with Allergenco-D spore trap cassettes and analyzed for airborne fungal spores and structures. Samples were collected at a rate of 15 liters per minute. Indoor air sample(s) were collected for a five (5) minute period of time (75 liters) at a height of approximately five (5) feet above finished floor (AFF). Outdoor air samples were collected for a five (5) minutes period of time (75 liters) at a height of approximately five (5) feet above level ground. American Conference of Governmental Industrial Hygienists (ACGIH) guidelines were followed for the sample collection. Fungal air samples were collected in the following areas:

<b>SPORE TRAP LOCATIONS</b>	
<b>SAMPLE NUMBER</b>	<b>LOCATION</b>
291555	Room 112
291549	Outdoor (West)
291550	Outdoor (South)

### 3.0 RESULTS

Currently, there are no regulatory standards for airborne fungal contamination. Therefore, results of the fungal analysis are compared against scientific guidelines. Bioaerosol samples are evaluated by comparing the indoor samples against the outdoor sample. The same types of fungi should be found in both the indoor and outdoor samples. Should higher fungal concentrations occur in the indoor sample(s) or complaint areas, this generally indicates there is a source of fungal growth in the area. The types of fungi are also evaluated-the same types/genus of fungi should be present in both the indoor/complaint and outdoor/non-complaint samples.

The results of the fungal air samples collected were evaluated. Air testing performed using spore traps found that airborne mold spores in the room were considerably lower and were qualitatively similar to those measured outside of the building at the time the sampling was performed.

### 4.0 CONCLUSIONS

Based on the analytical results, the air concentration was within regulatory guidelines on the day of the assessment.

# APPENDIX A

## ANALYTICAL DATA



# IAQ Mold Report

## Summary

TDLR License No.: LAB0117

AIHA EMPAT ID: 102577

2051 Valley View Lane  
Farmers Branch, TX 75234 Phone: (972) 241-8460

<b>Client :</b> Ensolum, LLC	<b>Lab Job No. :</b> 19F-04125
<b>Project :</b> Lewisville ISD, Arbor Creek Middle School	<b>Report Date :</b> 04/15/2019 3:20 PM
<b>Project # :</b> 01A1288020	<b>Sample Date:</b> 04/11/2019
<b>Sample Type:</b> Spore Trap, Non-cultured	<b>Spore Trap Type:</b> Allergenco D
<b>Test Method:</b> Mold: ASTM D7391-17e1 - Standard Profile	Page 1 of 2

On 4/11/2019, three (3) samples were submitted by Tod McLellan of Ensolum, LLC (located at 2351 W. Northwest Hwy Suite #1203, Dallas, TX 75220) for Spore Trap, Non-cultured mold analysis. This report consists of three sections; a summary section, a data detail section, and an analytical notes section.

Sample Number	Volume (liters)	Sample Description	Identification	Concentration spores/cubic meter
291555	75	Room 112 * See Analytical Notes report for further details	Aspergillus / Penicillium	71 25%
			Cladosporium	57 20%
			Ascospores	43 15%
			Alternaria	43 15%
			Hyphal / Spore Fragments - Dematiaceous	28 10%
			Hyphal / Spore Fragments - Hyaline	14 5%
			Curvularia	14 5%
			Basidiospores	14 5%
			Total:	284 100%
			291549	75
Ascospores	597 11%			
Basidiospores	398 8%			
Alternaria	242 5%			
Aspergillus / Penicillium	185 4%			
Agaricales group	142 3%			
Drechslera / Bipolaris group	71 1%			
Torula	57 1%			
Arthrinium	43 <1%			
Cercospora / Pseudocercospora	14 <1%			
Sporidesmium	14 <1%			
Coprinus group	14 <1%			
Ulocladium / Stemphylium	14 <1%			
Myxomycete / Rust / Smut	14 <1%			
Total:	5218 100%			



# IAQ Mold Report

## Summary

TDLR License No.: LAB0117

AIHA EMPAT ID: 102577

2051 Valley View Lane  
Farmers Branch, TX 75234 Phone: (972) 241-8460

**Client :** Ensolum, LLC**Lab Job No. :** 19F-04125**Project :** Lewisville ISD, Arbor Creek Middle School**Report Date :** 04/15/2019 3:20 PM**Project # :** 01A1288020**Sample Date:** 04/11/2019**Sample Type:** Spore Trap, Non-cultured**Spore Trap Type:** Allergenco D**Test Method:** Mold: ASTM D7391-17e1 - Standard Profile

Page 2 of 2

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Sample Number	Volume (liters)	Sample Description	Identification	Concentration spores/cubic meter
291550	75	Outdoor (South) * See Analytical Notes report for further details	Cladosporium Basidiospores Ascospores Alternaria Hyphal / Spore Fragments - Dematiaceous Agaricales group Drechslera / Bipolaris group Hyphal / Spore Fragments - Hyaline Myxomycete / Rust / Smut Coprinus group Epicoccum Aspergillus / Penicillium Fusicladium Torula Chaetomium  Total:	2176 66% 299 9% 270 8% 156 5% 71 2% 71 2% 57 2% 43 1% 43 1% 28 <1% 28 <1% 28 <1% 14 <1% 14 <1% 14 <1% 3312 100%

Results may not be reported except in full. Data contained in this test report relates only to the samples tested. This report does not express or imply interpretation of the results contained herein. Interpretation should be made by a qualified professional.

Moody Labs assumes no responsibility for the manner in which these samples were collected or handled prior to being received at this laboratory. Moody Labs assumes no responsibility for the qualifications of personnel performing sampling and/or interpretations of this data.

Analyst(s): Phoebe Stell

Lab Director : Heather Lopez

Approved Signatory : \_\_\_\_\_

Lab Director : Bruce Crabb

Approved Signatory : \_\_\_\_\_

Thank you for choosing Moody Labs

SMLMS v13.13



# IAQ Mold Report

## Data Detail

TDLR License No.: LAB0117

AIHA EMPAT ID: 102577

2051 Valley View Lane  
Farmers Branch, TX 75234 Phone: (972) 241-8460

**Client :** Ensolum, LLC  
**Project :** Lewisville ISD, Arbor Creek Middle School  
**Project # :** 01A1288020  
**Sample Type:** Spore Trap, Non-cultured  
**Test Method:** Mold: ASTM D7391-17e1 - Standard Profile

**Lab Job No. :** 19F-04125  
**Report Date :** 04/15/2019 3:20 PM  
**Sample Date:** 04/11/2019  
**Spore Trap Type:** Allergenco D

This report consists of three sections; a summary section, a data detail section, and an analytical notes section. Results may not be reported except in full.

Sample ID:	291555					291549					291550				
Location:	Room 112					Outdoor (West)					Outdoor (South)				
Media Expires On:	Feb 2020					Feb 2020					Feb 2020				
Notes Included:						See Analytical Notes					See Analytical Notes				
Volume:	75					75					75				
	raw ct.	RL	spores/m <sup>3</sup>	%total	spores/m <sup>3</sup> SF	raw ct.	RL	spores/m <sup>3</sup>	%total	spores/m <sup>3</sup> SF	raw ct.	RL	spores/m <sup>3</sup>	%total	spores/m <sup>3</sup> SF
Agaricales group						10	14	142	3%	140	5	14	71	2%	70
Alternaria	3	14	43	15%	40	17	14	242	5%	240	11	14	156	5%	160
Arthrinium						3	14	43	<1%	40					
Ascospores	3	14	43	15%	40	42	14	597	11%	600	19	14	270	8%	270
Aspergillus / Penicillium	5	14	71	25%	70	13	14	185	4%	180	2	14	28	<1%	30
Basidiospores	1	14	14	5%	10	28	14	398	8%	400	21	14	299	9%	300
Cercospora / Pseudocercospora						1	14	14	<1%	10					
Chaetomium											1	14	14	<1%	10
Cladosporium	4	14	57	20%	60	104	33	3413	65%	3400	102	21	2176	66%	2200
Coprinus group						1	14	14	<1%	10	2	14	28	<1%	30
Curvularia	1	14	14	5%	10										
Drechslera / Bipolaris group						5	14	71	1%	70	4	14	57	2%	60
Epicoccum											2	14	28	<1%	30
Fusicladium											1	14	14	<1%	10
Hyphal / Spore Fragments - Dematiace	2	14	28	10%	30						5	14	71	2%	70
Hyphal / Spore Fragments - Hyaline	1	14	14	5%	10						3	14	43	1%	40
Memnoniella															
Myxomycete / Rust / Smut						1	14	14	<1%	10	3	14	43	1%	40
Sporidesmium						1	14	14	<1%	10					
Stachybotrys															
Torula						4	14	57	1%	60	1	14	14	<1%	10
Ulocladium / Stemphylium						1	14	14	<1%	10					
<b>TOTALS</b>	<b>20</b>		<b>284</b>	<b>100%</b>	<b>280</b>	<b>231</b>		<b>5218</b>	<b>100%</b>	<b>5200</b>	<b>182</b>		<b>3312</b>	<b>100%</b>	<b>3300</b>
Analyst	Phoebe Stell					Phoebe Stell					Phoebe Stell				
Analysis Date	4/15/2019					4/15/2019					4/15/2019				
Debris Rating	5					4					4				
Debris Composition															
Fibers	1/5					1/5					1/5				
Inorganic/Other	2/5					3/5					2/5				
Insect Parts	2/5					1/5					3/5				
Pollen	2/5					4/5					4/5				
Skin/Dander	5/5					1/5					1/5				

End of Data Detail section  
19F-04125



# IAQ Mold Report

## Analytical Notes

TDLR License No.: LAB0117

AIHA EMPAT ID: 102577

2051 Valley View Lane

Farmers Branch, TX 75234 Phone: (972) 241-8460

**Client :** Ensolum, LLC

**Lab Job No. :** 19F-04125

**Project :** Lewisville ISD, Arbor Creek Middle School

**Report Date :** 04/15/2019 3:20 PM

**Project # :** 01A1288020

**Sample Date :** 04/11/2019

**Sample Type:** Spore Trap, Non-cultured

**Spore Trap Type:** Allergenco D

**Test Method:** Mold: ASTM D7391-17e1 - Standard Profile

Page 1 of 3

This report consists of three sections; a summary section, a data detail section, and an analytical notes section. Results may not be reported except in full.

### Samples Analyzed

Sample No 291555 : Room 112

Notes: 50% Occluded.

Sample No 291549 : Outdoor (West)

Notes: Please note: the minimum detection limit for Cladosporium is 33 spores / cubic meter. When comparing results to other samples, use calculated results, not raw numbers.

Sample No 291550 : Outdoor (South)

Notes: Please note: the minimum detection limit for Cladosporium is 21 spores / cubic meter. When comparing results to other samples, use calculated results, not raw numbers.

### Field Blanks

No discernable field blanks were submitted with this set of samples.



# IAQ Mold Report

## Analytical Notes

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**Spore Trap Type:** Allergenco D

**Test Method:** Mold: ASTM D7391-17e1 - Standard Profile

Page 2 of 3

This report consists of three sections; a summary section, a data detail section, and an analytical notes section. Results may not be reported except in full.

### Methods

Method: ASTM D7391-17e1: Categorization and Quantification of Airborne Fungal Structures in an Inertial Impaction Sample by Optical Microscopy.

Samples are read at 100% unless noted. Partial readings may be employed when concentrations are elevated. Use final spore concentrations, not raw spore counts, for interpretation of results.

Calculation: Spores/cubic meter = (Raw spore count)\*(RL)

Note: RL (Reporting Limit) is based upon 1 raw spore count.

Moody Labs recommends two significant figures for calculated values based on ASTM D7391-17e1.

This report must not be used by the customer to claim product certification, approval, or endorsement by AIHA, ISO, or any agency of the Federal Government.

### Debris Rating Key

0 - No linear trace detected

1 - Trace particulate/debris

2 - Light particulate/debris

3 - Moderate particulate/debris.

4 - Substantial particulate/debris

5 - Extensive particulate/debris

6 - Field blank

10 - Hold Sample

11 - Modified Analysis per Client Instructions

NOTE: Particulate/debris are defined as skin, fibers, pollen grains, insect parts, fungal and/or other non-fungal particles.



# IAQ Mold Report

## Analytical Notes

TDLR License No.: LAB0117

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2051 Valley View Lane

Farmers Branch, TX 75234 Phone: (972) 241-8460

**Client :** Ensolum, LLC

**Project :** Lewisville ISD, Arbor Creek Middle School

**Project # :** 01A1288020

**Sample Type:** Spore Trap, Non-cultured

**Test Method:** Mold: ASTM D7391-17e1 - Standard Profile

**Lab Job No. :** 19F-04125

**Report Date :** 04/15/2019 3:20 PM

**Sample Date :** 04/11/2019

**Spore Trap Type:** Allergenco D

Page 3 of 3

This report consists of three sections; a summary section, a data detail section, and an analytical notes section. Results may not be reported except in full.



End of Analytical Notes section  
19F-04125

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Moody Labs  
2051 Valley View Lane  
Farmers Branch, TX 75234 Phone: (972) 241-8460

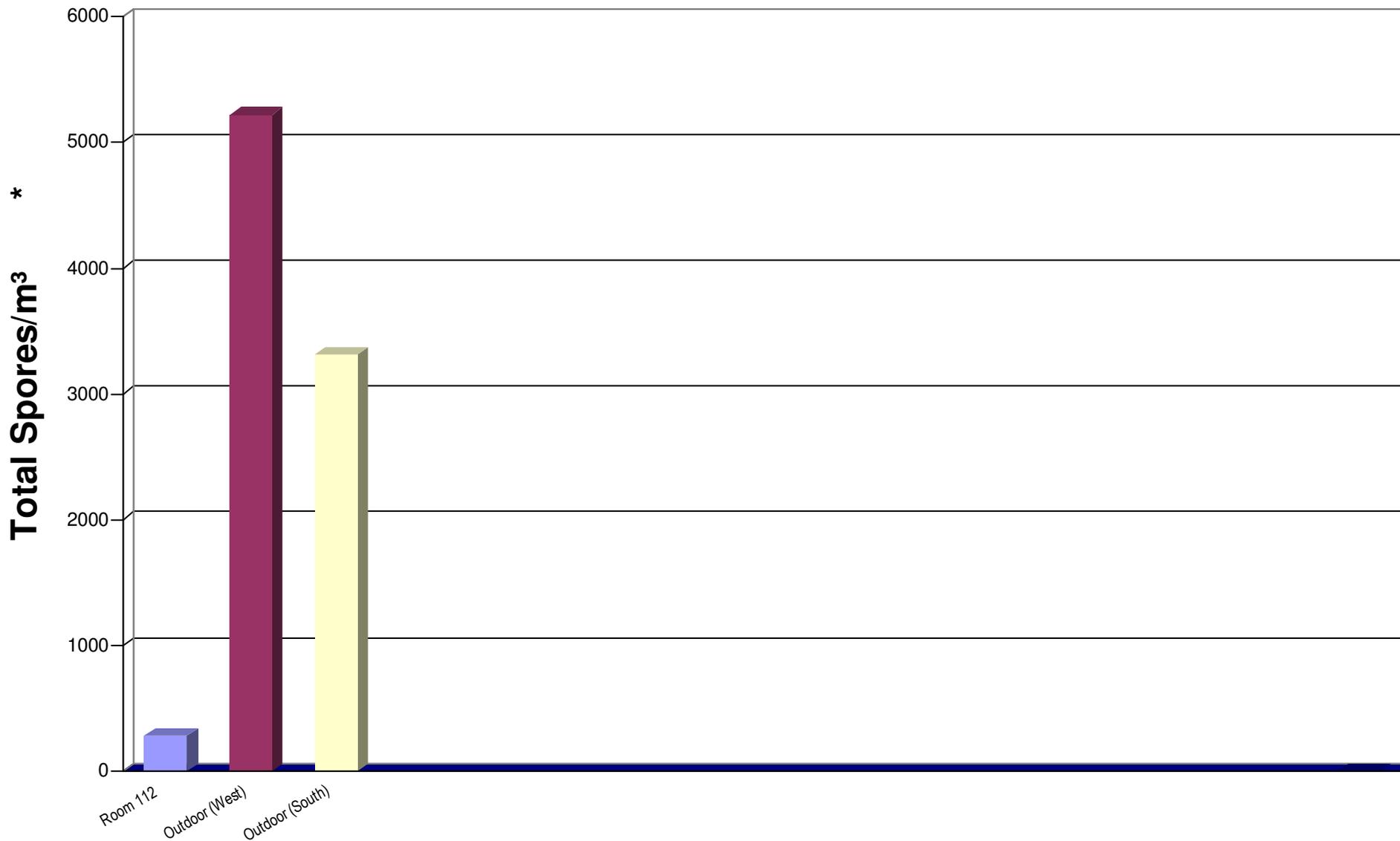
# IAQ Mold Report

## Supplemental Overview

TDLR License No.: LAB0117  
AIHA EMPAT ID: 102577

**Client :** Ensolum, LLC  
**Project :** Lewisville ISD, Arbor Creek Middle School  
**Project # :** 01A1288020

**Lab Job No.** 19F-04125  
**Report Date** 04/15/2019 3:20 PM  
**Sample Date :** 04/11/2019





# IAQ Mold Report Supplemental Overview

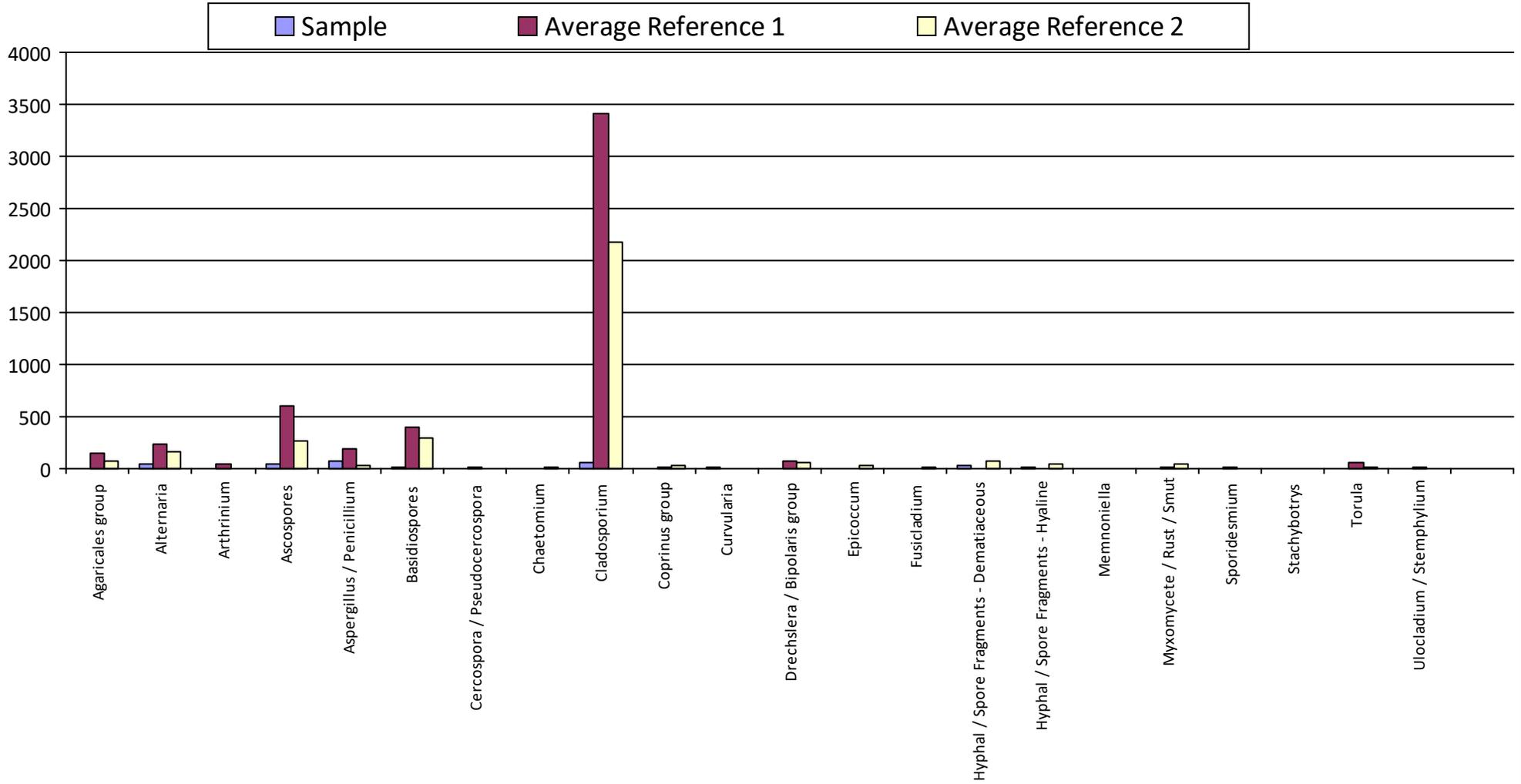
TDLR License No.: LAB0117  
AIHA EMPAT ID: 102577

2051 Valley View Lane  
Farmers Branch, TX 75234 Phone: (972) 241-8460

**Client :** Ensolum, LLC  
**Project :** Lewisville ISD, Arbor Creek Middle School  
**Project # :** 01A1288020

Room 112

**Lab Job No.** 19F-04125  
**Report Date** 04/15/2019 3:20 PM  
**Sample Date :** 04/11/2019



Average Reference 1 = Outdoor (West)

Average Reference 2 = Outdoor (South)



# IAQ Mold Report

## Supplemental Overview

TDLR License No.: LAB0117

AIHA EMPAT ID: 102577

2051 Valley View Lane

Farmers Branch, TX 75234 Phone: (972) 241-8460

**Client :** Ensolum, LLC

**Project :** Lewisville ISD, Arbor Creek Middle School

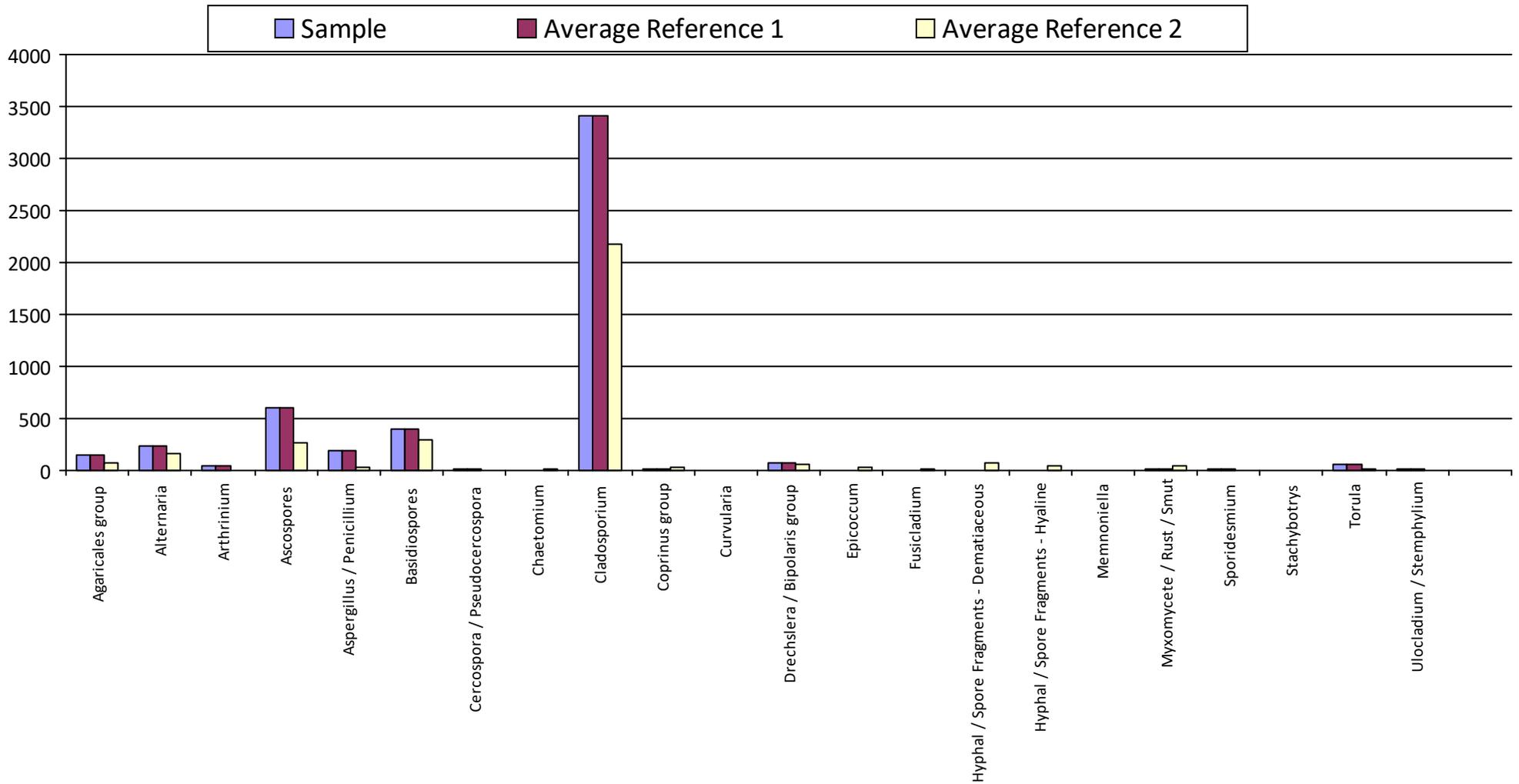
**Project # :** 01A1288020

**Lab Job No.** 19F-04125

**Report Date** 04/15/2019 3:20 PM

**Sample Date :** 04/11/2019

Outdoor (West)



Average Reference 1 = Outdoor (West)

Average Reference 2 = Outdoor (South)



# IAQ Mold Report

## Supplemental Overview

TDLR License No.: LAB0117

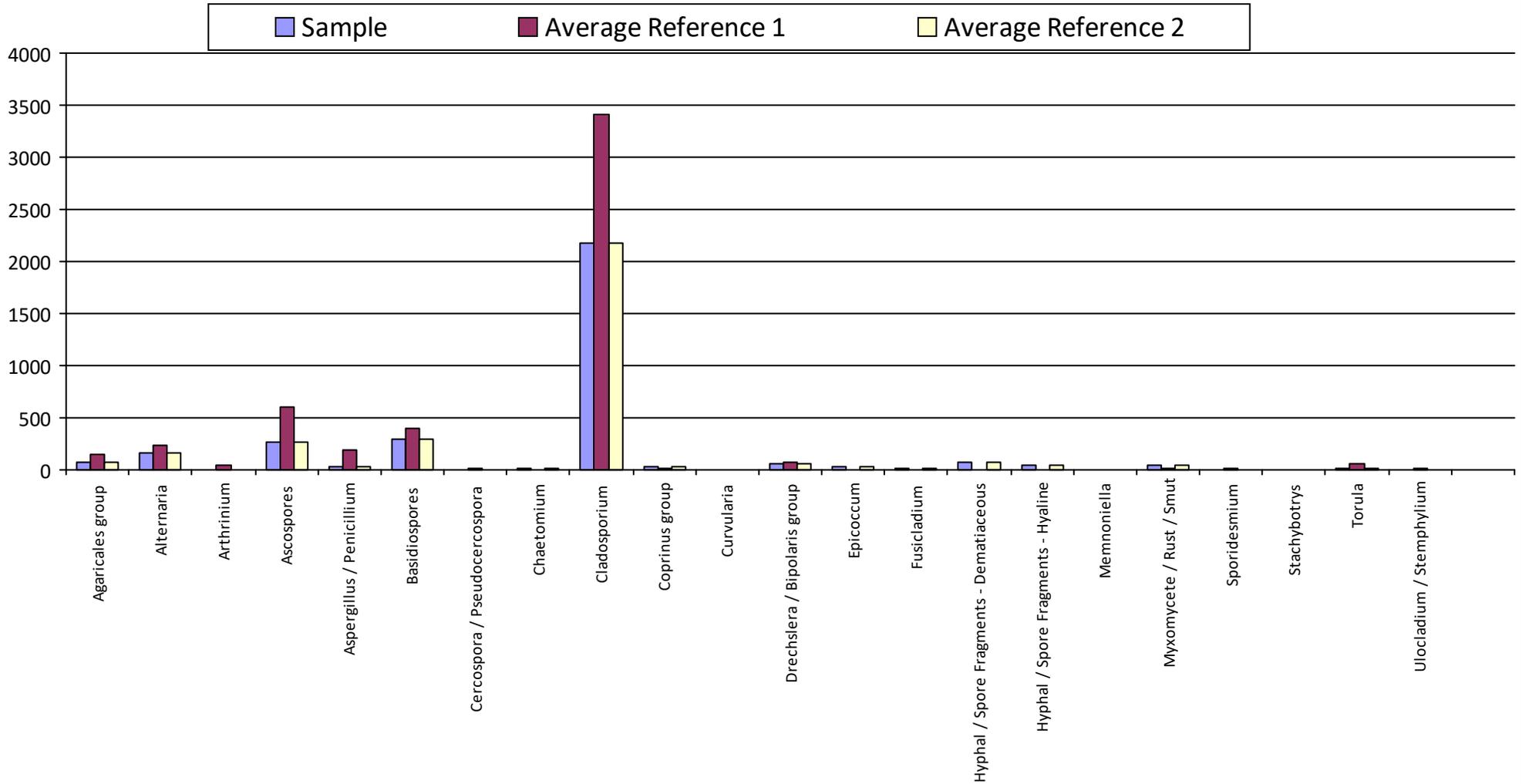
AIHA EMPAT ID: 102577

2051 Valley View Lane  
Farmers Branch, TX 75234 Phone: (972) 241-8460

**Client :** Ensolum, LLC  
**Project :** Lewisville ISD, Arbor Creek Middle School  
**Project # :** 01A1288020

**Lab Job No.** 19F-04125  
**Report Date** 04/15/2019 3:20 PM  
**Sample Date :** 04/11/2019

Outdoor (South)



Average Reference 1 = Outdoor (West)

Average Reference 2 = Outdoor (South)

# APPENDIX B

## DEFINITIONS AND LIMITATIONS



# ENSOLUM

## Mold Services Definitions & Limitations

Ensolum performed services in accordance with generally accepted practices of the profession undertaken in similar services at the same time and in the same geographical area. No other warranties, express or implied, apply to the services hereunder or the final report.

Ensolum's services and any report have been prepared on behalf of and for the exclusive use of the Client solely for its use and reliance in assessing the presence of mold in the Investigation Areas of the site. The Client was the only party to which Ensolum explained the risks and limitations of the services and was solely involved in shaping the scope of services. Accordingly, reliance on this report by any other party may involve assumptions leading to an unintended interpretation of findings and opinions. With the consent of the Client, Ensolum may offer reliance to third parties or contract with other parties to develop findings and opinions related to such party's unique risk management concerns. Notwithstanding the foregoing, reliance by any and all third parties upon this deliverable, Ensolum's services or any subsequent report shall be limited in the aggregate to the fair market value of the services provided by Ensolum.

"Limited Mold Assessment". This deliverable uses the term "Limited Mold Assessment" to denote that Ensolum's mold assessment services are limited: (i) to certain portions of the building structure (e.g., the Investigation Areas), by non-destructive sampling methodologies, and/or by access limitations to building materials or components within the Investigation Area(s). In contrast to a "Limited Assessment" is a comprehensive assessment would involve destructive sampling methods with the assessment to be conducted throughout the entire building structure.

Time sensitive. One must keep in mind that mold assessments are essentially a "snap shot in time," and the results are only relevant at the time of site reconnaissance. Because mold, when biologically active, is a living organism, its presence is influenced and controlled by environmental conditions. Mold assessments, therefore, are "time sensitive" in that the presence and concentration of mold and similar organisms in building structures or in the air is directly influenced by environmental conditions (such as humidity, moisture, nutrients and substrates), whether natural or caused by man, which conditions may vary significantly over relatively short periods of time.

Methodologies. Currently, mold assessment methodologies and protocols in Texas are governed by persuasive guidelines (rather than promulgated federal/state or local regulations). Presently, there is no data that supports a threshold limit or dose-response relationship for exposure to mold aeroallergens, individual pathogens, opportunistic pathogens and/or mycotoxins. The Occupational Safety and Health Administration (OSHA), the National Institute of Occupational Safety and Health (NIOSH) and other non-governmental associations, have not yet established permissible exposure limits (PELs), recommended exposure limits (RELs), or other limit values for fungi. Because no limit values presently exist. Ensolum will not and cannot represent that the site contains no harmful microbes, mold, fungi, or their metabolites, or other latent conditions beyond those identified by the limited scope of this mold assessment.



Findings limited. Findings in an LMA are limited due to the nature of the information obtained such as a visual reconnaissance of readily accessible areas of building structures, interview information, anecdotal information, and limited sampling data derived from one or more specific sampling events. Ensolum cannot warrant the accuracy of prior or subsequent information/data, reports and services performed by other firms at the Site. Ensolum assumes no responsibility or liability for errors in information or data provided by or through the client or third party sources. Ensolum's services are not to be construed as legal or medical interpretation or advice.

Moisture Intrusion Limitation. Ensolum performs mold assessment services and is not a moisture intrusion, HVAC, plumbing or building envelope specialist. However, during the course of conducting its mold assessment services, Ensolum will report observed areas of apparent moisture intrusion. Ensolum does not and will not investigate the cause or causes of such observed moisture intrusion. In the event apparent moisture intrusion is observed, Ensolum will recommend that the client contact a specialist (i.e., plumbing contractor, building envelope specialist, HVAC contractor, water intrusion specialist, etc.) to assist the client in determining the specific cause or causes of the moisture intrusion and remedial options.

Certificate of Mold Damage Remediation (CMDR). For mold remediation projects (above certain size thresholds), applicable Texas law (i.e., Texas Occupation Code Section 1958.54 and T.A.C. Section 295.397 (the Texas Mold Assessment and Remediation Rules), requires that a "Certificate of Mold Damage Remediation" be issued by the Mold Remediation Contractor upon successful completion of the project. This certificate must be provided to property owners no later than the 10<sup>th</sup> day after the date on which the mold remediation is completed at a property. The Mold Remediation Certificate issued by the Mold Remediation Contractor must include a certification by the Mold Assessor that the mold remediation project has been successfully completed in accordance with the mold remediation protocol.

Be advised that Ensolum's issuance of a CMDR upon successful completion of a Mold Remediation project does not mean, warrant or otherwise guarantee that mold will not be subsequently found in any portion of an Investigation Area or the Site. In the event that Ensolum is engaged to render services in connection with a mold remediation project, ENSOLUM will require Client to provide to Ensolum written documentation that all sources of moisture which contributed to the presence of mold in the Investigation Area have been fully remediated and corrected prior to achieving clearance.