



# CAMPLIN

Environmental Services, Inc.

August 15, 2017

Highland Middle School - Libertyville School District 70  
310 W. Rockland Road  
Libertyville, IL 60048

Attention: Megan Russell, Assistant Principal

Subject: Mold Evaluation and Testing  
Highland Middle School

Dear Megan,

On Wednesday, August 9, 2017, Jeffery Camplin, Senior Consultant for Camplin Environmental Services, Inc. (CESI) was contracted to evaluate areas at Highland Middle School that were impacted by recent flooding for the presence of elevated levels of mold spores. Testing was performed using "spore trap" air monitoring. This method collects non-viable airborne fungal spores. A total of 7 air samples were collected. Six samples were obtained from corridor areas where minor flooding had occurred in the building including near rooms 006/007, 110/112, 124, 138, 142, and 203. A final sample was obtained from outdoor air for statistical comparison purposes.

### Findings

All areas tested were found to have total mold spores counts below the "action level" of 1,300 colony forming units per cubic meter of air (cfu/m<sup>3</sup>) established by the National Association for Moisture Management (NAMM). Although the minor amounts of mold spores found inside of the building were similar to spores found in the outdoor air, any samples found above the "action level" would have warranted further investigation. No immediate actions are required at this time.

### Recommendations

A visual walkthrough of the building revealed carpeting in room 006 that had been impacted by the flooding. This was the only room noted in the area that had carpeting. The carpeting had evidence of rust beneath a file cabinet indicating the presence of moisture on at least one occasion. The carpeting had been cleaned and disinfected and there was no apparent mold issues revealed from the testing. Although there is no immediate concern, I am recommending the school consider a proactive measure to replace the flood impacted carpeting in room 006 with floor tile to further reduce the potential for mold concerns in the future.

The laboratory results are attached for your information. Please contact my office with any questions.

Cordially,



Jeffery Camplin, CSP, CPEA, CET  
President

## Laboratory Results



Report for:

**Mr. Jeffrey Camplin**  
**Camplin Environmental**  
9575 W. Higgins Rd.  
Suite 450  
Rosemont, IL 60018

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Regarding: Project: Libertyville SD 70; Highland School  
EML ID: 1774018

Approved by:

Dates of Analysis:  
Spore trap analysis: 08-11-2017



Regional Director  
Michael Berg

Service SOPs: Spore trap analysis (EM-MY-S-1038)  
AIHA-LAP, LLC accredited service, Lab ID #176641

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All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. Due to the nature of the analyses performed, field blank correction of results is not applied. The results relate only to the items tested.

EMLab P&K ("the Company") shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

EMLab P&K's LabServe® reporting system includes automated fail-safes to ensure that all AIHA-LAP, LLC quality requirements are met and notifications are added to reports when any quality steps remain pending.

Client: Camplin Environmental  
C/O: Mr. Jeffrey Camplin  
Re: Libertyville SD 70; Highland School

Date of Sampling: 08-09-2017  
Date of Receipt: 08-09-2017  
Date of Report: 08-11-2017

**SPORE TRAP REPORT: NON-VIABLE METHODOLOGY**

Location:	24156106: Corridor by 203		24156028: Corridor by 007		24156103: Corridor by 138		24156080: Corridor by 142	
Comments (see below)	None		A		None		None	
Lab ID-Version‡:	8288799-1		8288800-1		8288801-1		8288802-1	
Analysis Date:	08/11/2017		08/11/2017		08/11/2017		08/11/2017	
	raw ct.	spores/m3	raw ct.	spores/m3	raw ct.	spores/m3	raw ct.	spores/m3
Ascospores			1	53			1	53
Basidiospores	1	53	2	110			2	110
Chaetomium			2	27				
Cladosporium	1	53	21	320				
Curvularia								
Epicoccum								
Fusarium								
Myrothecium								
Nigrospora	2	27						
Other colorless								
Penicillium/Aspergillus types†			13	690	5	270		
Pithomyces					2	27		
Polythrincium								
Rusts							2	27
Smuts, Periconia, Myxomycetes								
Stachybotrys								
Stemphylium								
Torula								
Ulocladium								
Zygomycetes								
Background debris (1-4+)††	1+		2+		1+		1+	
Hyphal fragments/m3	< 13		13		< 13		13	
Pollen/m3	13		< 13		< 13		< 13	
Skin cells (1-4+)	1+		1+		1+		1+	
Sample volume (liters)	75		75		75		75	
<b>§ TOTAL SPORES/m3</b>		<b>130</b>		<b>1,200</b>		<b>290</b>		<b>190</b>

Comments: A) 20 of the raw count *Cladosporium* spores were present as a single clump.

Spore types listed without a count or data entry were not detected during the course of the analysis for the respective sample, indicating a raw count of <1 spore.

† The spores of *Aspergillus* and *Penicillium* (and others such as *Acremonium*, *Paecilomyces*) are small and round with very few distinguishing characteristics. They cannot be differentiated by non-viable sampling methods. Also, some species with very small spores are easily missed, and may be undercounted.

†† Background debris indicates the amount of non-biological particulate matter present on the trace (dust in the air) and the resulting visibility for the analyst. It is rated from 1+ (low) to 4+ (high). Counts from areas with 4+ background debris should be regarded as minimal counts and may be higher than reported. It is important to account for samples volumes when evaluating dust levels.

The analytical sensitivity is the spores/m<sup>3</sup> divided by the raw count, expressed in spores/m<sup>3</sup>. The limit of detection is the analytical sensitivity (in spores/m<sup>3</sup>) multiplied by the sample volume (in liters) divided by 1000 liters.

For more information regarding analytical sensitivity, please contact QA by calling the laboratory.

‡ A "Version" indicated by -"x" after the Lab ID# with a value greater than 1 indicates a sample with amended data. The revision number is reflected by the value of "x".

§ Total Spores/m<sup>3</sup> has been rounded to two significant figures to reflect analytical precision.

Client: Camplin Environmental  
C/O: Mr. Jeffrey Camplin  
Re: Libertyville SD 70; Highland School

Date of Sampling: 08-09-2017  
Date of Receipt: 08-09-2017  
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**SPORE TRAP REPORT: NON-VIABLE METHODOLOGY**

Location:	24155949: Corridor by 110/112		24156031: Corridor by 124		24156038: Outside	
Comments (see below)	None		None		None	
Lab ID-Version‡:	8288803-1		8288804-1		8288805-1	
Analysis Date:	08/11/2017		08/11/2017		08/11/2017	
	raw ct.	spores/m3	raw ct.	spores/m3	raw ct.	spores/m3
Ascospores	1	53			10	530
Basidiospores	3	160	1	53	46	2,500
Chaetomium			1	13		
Cladosporium			2	110	31	1,700
Curvularia						
Epicoccum					6	80
Fusarium						
Myrothecium						
Nigrospora						
Other colorless						
Penicillium/Aspergillus types†					5	270
Pithomyces			2	27	2	27
Polythrincium					1	13
Rusts			2	27	3	40
Smuts, Periconia, Myxomycetes						
Stachybotrys						
Stemphylium						
Torula						
Ulocladium						
Zygomycetes						
Background debris (1-4+)††	1+		1+		2+	
Hyphal fragments/m3	< 13		< 13		< 13	
Pollen/m3	< 13		< 13		27	
Skin cells (1-4+)	1+		1+		< 1+	
Sample volume (liters)	75		75		75	
<b>§ TOTAL SPORES/m3</b>		<b>210</b>		<b>230</b>		<b>5,100</b>

**Comments:**

Spore types listed without a count or data entry were not detected during the course of the analysis for the respective sample, indicating a raw count of <1 spore.

† The spores of *Aspergillus* and *Penicillium* (and others such as *Acremonium*, *Paecilomyces*) are small and round with very few distinguishing characteristics. They cannot be differentiated by non-viable sampling methods. Also, some species with very small spores are easily missed, and may be undercounted.

†† Background debris indicates the amount of non-biological particulate matter present on the trace (dust in the air) and the resulting visibility for the analyst. It is rated from 1+ (low) to 4+ (high). Counts from areas with 4+ background debris should be regarded as minimal counts and may be higher than reported. It is important to account for samples volumes when evaluating dust levels.

The analytical sensitivity is the spores/m<sup>3</sup> divided by the raw count, expressed in spores/m<sup>3</sup>. The limit of detection is the analytical sensitivity (in spores/m<sup>3</sup>) multiplied by the sample volume (in liters) divided by 1000 liters.

For more information regarding analytical sensitivity, please contact QA by calling the laboratory.

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§ Total Spores/m<sup>3</sup> has been rounded to two significant figures to reflect analytical precision.

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Date of Sampling: 08-09-2017  
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**MoldRANGE™, Local Climate; Extended Outdoor Comparison**  
**Outdoor Location: 24156038, Outside**

Fungi Identified	Outdoor data	Typical Outdoor Data for: August in Illinois† EMLab Local Climate code¹ B Annual Temp, A Elev., B Rain, A Temp. Range (n‡=145)						Typical Outdoor Data for: The entire year in Illinois† EMLab Local Climate code¹ B Annual Temp, A Elev., B Rain, A Temp. Range (n‡=1253)					
		very low	low	med	high	very high	freq %	very low	low	med	high	very high	freq %
Project zip code 60048	spores/m3												
<b>Generally able to grow indoors*</b>													
Alternaria	-	25	50	130	370	590	87	13	13	53	190	310	57
Bipolaris/Drechslera group	-	10	13	13	27	28	22	7	12	13	27	50	8
Chaetomium	-	-	-	-	-	-	3	7	13	20	43	64	4
Cladosporium	1,700	630	1,200	2,800	8,200	13,000	99	53	160	690	3,100	5,900	88
Curvularia	-	9	13	13	22	27	18	7	13	13	27	51	6
Epicoccum	80	13	13	40	90	160	81	13	13	40	110	190	48
Nigrospora	-	9	13	27	43	89	45	7	13	21	53	99	23
Penicillium/Aspergillus types	270	53	100	290	670	1,600	47	41	53	110	370	730	40
Pithomyces	27	13	13	40	110	160	67	7	13	27	80	140	24
Polythrincium	13	-	-	-	-	-	12	7	13	13	29	65	5
Stachybotrys	-	-	-	-	-	-	< 1	13	13	33	67	180	2
Torula	-	11	13	25	67	83	17	7	13	21	44	62	6
<b>Seldom found growing indoors**</b>													
Ascospores	530	240	380	1,100	2,700	4,100	99	53	110	530	1,700	3,200	79
Basidiospores	2,500	480	880	2,000	6,100	11,000	> 99	53	160	800	3,100	6,100	86
Rusts	40	13	20	42	120	170	63	13	13	27	120	170	32
Smuts, Periconia, Myxomycetes	-	13	13	40	97	180	61	13	13	40	110	210	52
<b>§ TOTAL SPORES/m3</b>	<b>5,100</b>												

¹EMLab Local Climate codes are a climate classification scheme for statewide geographic areas. The MoldRANGE™ Local Climate report uses the sampling location zip code to identify the EMLab Local Climate code in that area. Using information available from the NOAA weather database, the EMLab Local Climate code sharpens the precision of the MoldRANGE™ reporting system, providing more reliable estimates of the range and average concentrations of the different airborne fungal spore types for each region. Additional information on the EMLab Local Climate code system can be found on the last page of this report.

†The Typical Outdoor Data represents the typical outdoor spore levels across the state for the time period and EMLab Local Climate code indicated. The last column represents the frequency of occurrence. The very low, low, med, high, and very high values represent the 10, 20, 50, 80, and 90 percentile values of the spore type when it is detected. For example, if the frequency of occurrence is 63% and the low value is 53, it would mean that the given spore type is detected 63% of the time and, when detected, 20% of the time it is present in levels above the detection limit and below 53 spores/m3. These values are updated periodically and if not enough data is available to make a statistically meaningful assessment, it is indicated with a dash.

‡ n is the sample size used to calculate the MoldRANGE™ Local Climate data summarized in the table.

\* The spores in this category are generally capable of growing on wet building materials in addition to growing outdoors. Building related growth is dependent upon the fungal type, moisture level, type of material, and other factors. *Cladosporium* is one of the predominant spore types worldwide and is frequently present in high numbers. *Penicillium/Aspergillus* species colonize both outdoor and indoor wet surfaces rapidly and are very easily dispersed. Other genera are usually present in lesser numbers.

\*\* These fungi are generally not found growing on wet building materials. For example, the rusts and smuts are obligate plant pathogens. However, in each group there are notable exceptions. For example, agents of wood decay are members of the basidiomycetes and high counts of a single morphological type of basidiospore on an inside sample should be considered significant.

§ Total Spores/m3 has been rounded to two significant figures to reflect analytical precision.

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### Understanding EMLab Local Climate Codes

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Outdoor airborne spore concentrations are strongly influenced by climate and weather patterns, often resulting in pronounced seasonal and diurnal cycles (Burge 1995). The seasonal climatic changes directly affect the growth cycle of plants, thereby influencing fungal growth, spore maturation, and release cycles. By evaluating outdoor spore concentrations across similar climatic zones rather than for the state as a whole, it is possible to provide a more representative estimate of typical outdoor spore levels and frequency of occurrence for different airborne fungal spore types in a given area.

The EMLab Local Climate code system is a novel and patent pending classification system that uses data from the NOAA - National Oceanic and Atmospheric Administration database to define unique climate regions by state. The following local climate variables, for each statewide zip code, are obtained from NOAA and assigned a letter code of A (above the statewide average for that variable) or B (below the statewide average for that variable):

1. Annual High Temperature
2. Elevation
3. Rainfall/Precipitation
4. Monthly Temperature Range

The result is a 4-character code assigned to each statewide zip code, referred to as the Local Climate Code. Below are some examples of decoded Local Climate Codes:

**AAAA** = Above avg. Annual High Temperature, Above avg. Elevation, Above avg. Rainfall/Precipitation, Above avg. Monthly Temperature Range  
**AABB** = Above avg. Annual High Temperature, Above avg. Elevation, Below avg. Rainfall/Precipitation, Below avg. Monthly Temperature Range  
**BBA** = Below avg. Annual High Temperature, Below avg. Elevation, Above avg. Rainfall/Precipitation, Above avg. Monthly Temperature Range

The actual outdoor air sample data from matching local climate codes in each state are then compiled in a manner relating typical spore concentrations and frequency of occurrence.

The NOAA local climate variables were selected by mapping data points from a subset of approximately 145,000 weather and geographic database entries to over 80,000 outdoor spore trap samples with known zip codes and assessing them using orthogonal array experimental design techniques. The results were then compared to the typical ranges of spore types found when grouping zip codes using the Koppen-Geiger climatic classification system; a commonly used climatic system that provides an objective numerical definition in terms of climatic elements such as temperature, rainfall, and other seasonal characteristics. The EMLab Local Climate codes showed improved granularity and refinement of the zip code groupings, implying a better representation of the expected range of spore types to be found within an individual zip code.

The values on this report were calculated by obtaining the four variables listed above from the over 585 million data points of weather and geographic information available in the NOAA database, and determining the frequencies and percentile values of spore types by utilizing over 180,000 EMLab P&K outdoor spore trap samples with known zip codes.

This report groups statewide zip codes in relation to these EMLab Local Climate codes and summarizes MoldRANGE™ data by month and year within each EMLab Local Climate code.

#### References:

Burge, Harriet, A. Bioaerosols: Boca Raton: Lewis Publishers, pp. 163-171, 1995.

Interpretation of the data contained in this report is left to the client or the persons who conducted the field work. This report is provided for informational and comparative purposes only and should not be relied upon for any other purpose. "Typical outdoor data" are based on the results of the analysis of samples delivered to and analyzed by EMLab P&K and assumptions regarding the origins of those samples. Sampling techniques, contaminants infecting samples, unrepresentative samples and other similar or dissimilar factors may affect these results. In addition, EMLab P&K may not have received and tested a representative number of samples for every region or time period. EMLab P&K hereby disclaims any liability for any and all direct, indirect, punitive, incidental, special or consequential damages arising out of the use or interpretation of the data contained in, or any actions taken or omitted in reliance upon, this report.

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 Re: Libertyville SD 70; Highland School

Date of Sampling: 08-09-2017  
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**MoldSTAT™: Supplementary Statistical Spore Trap Report**

**Outdoor Summary: 24156038: Outside**

Species detected	Outdoor sample spores/m3				Typical outdoor ranges (North America)	Freq. %
	<100	1K	10K	>100K		
Ascospores				530	13 - 210 - 6,300	77
Basidiospores				2,500	13 - 450 - 23,000	91
Cladosporium				1,700	27 - 480 - 9,500	90
Epicoccum				80	7 - 27 - 350	23
Penicillium/Aspergillus types				270	13 - 180 - 2,600	67
Pithomyces				27	7 - 27 - 520	14
Polythrincium				13	7 - 13 - 180	3
Rusts				40	7 - 27 - 370	20
Smuts, Periconia, Myxomycetes				< 13	7 - 53 - 1,000	64
<b>Total</b>				<b>5,100</b>		

The "Typical outdoor ranges" and "Freq. %" columns show the typical low, medium, and high spore counts per cubic meter and the frequency of occurrence for the given spore type. The low, medium, and high values represent the 2.5, 50, and 97.5 percentile values when the spore type is detected. For example, if the low value is 53 and the frequency of occurrence is 63%, it would mean that we typically detect the given spore type on 63 percent of all outdoor samples and, when detected, 2.5% of the time it is present in levels below 53 spores/m3.

**Indoor Samples**

**Location: 24156106: Corridor by 203**

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 2%	dF: 5 Result: 3.6429 Critical value: 11.0705 Inside Similar: Yes	Result: 0.3636	dF: 9 Result: 0.5000 Critical value: 0.5833 Outside Similar: No	Score: 111 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
	Basidiospores				53
	Cladosporium				53
	Nigrospora				27
	<b>Total</b>				<b>130</b>

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**MoldSTAT™: Supplementary Statistical Spore Trap Report**

**Location:** 24156028: Corridor by 007

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 23%	dF: 5 Result: 3.6429 Critical value: 11.0705 Inside Similar: Yes	Result: 0.6154	dF: 9 Result: 0.6750 Critical value: 0.5833 Outside Similar: Yes	Score: 194 Result: Medium	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
Ascospores					53
Basidiospores					110
Chaetomium					27
Cladosporium					320
Penicillium/Aspergillus types					690
<b>Total</b>					1,200

**Location:** 24156103: Corridor by 138

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 5%	dF: 5 Result: 3.6429 Critical value: 11.0705 Inside Similar: Yes	Result: 0.4000	dF: 8 Result: 0.0536 Critical value: 0.6190 Outside Similar: No	Score: 140 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
Penicillium/Aspergillus types					270
Pithomyces					27
<b>Total</b>					290

**Location:** 24156080: Corridor by 142

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 3%	dF: 5 Result: 3.6429 Critical value: 11.0705 Inside Similar: Yes	Result: 0.5455	dF: 8 Result: 0.5714 Critical value: 0.6190 Outside Similar: No	Score: 102 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
Ascospores					53
Basidiospores					110
Rusts					27
<b>Total</b>					190

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**MoldSTAT™: Supplementary Statistical Spore Trap Report**

**Location:** 24155949: Corridor by 110/112

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 4%	dF: 5 Result: 3.6429 Critical value: 11.0705 Inside Similar: Yes	Result: 0.4000	dF: 8 Result: 0.7083 Critical value: 0.6190 Outside Similar: Yes	Score: 106 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
Ascospores					53
Basidiospores					160
<b>Total</b>					210

**Location:** 24156031: Corridor by 124

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 4%	dF: 5 Result: 3.6429 Critical value: 11.0705 Inside Similar: Yes	Result: 0.6154	dF: 9 Result: 0.3708 Critical value: 0.5833 Outside Similar: No	Score: 121 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
Basidiospores					53
Chaetomium					13
Cladosporium					110
Pithomyces					27
Rusts					27
<b>Total</b>					230

\* The Friedman chi-square statistic is a non-parametric test that examines variation in a set of data (in this case, all indoor spore counts). The null hypothesis (H0) being tested is that there is no meaningful difference in the data for all indoor locations. The alternative hypothesis (used if the test disproves the null hypothesis) is that there is a difference between the indoor locations. The null hypothesis is rejected when the result of the test is greater than the critical value. The critical value that is displayed is based on the degrees of freedom (dF) of the test and a significance level of 0.05.

\*\* An agreement ratio is a simple method for assessing the similarity of two samples (in this case the indoor sample and the outdoor summary) based on the spore types present. A score of one indicates that the types detected in one location are the same as that in the other. A score of zero indicates that none of the types detected indoors are present outdoors. Typically, an agreement of 0.8 or higher is considered high.

\*\*\* The Spearman rank correlation is a non-parametric test that examines correlation between two sets of data (in this case the indoor location and the outdoor summary). The null hypothesis (H0) being tested is that the indoor and outdoor samples are unrelated. The alternative hypothesis (used if the test disproves the null hypothesis) is that the samples are similar. The null hypothesis is rejected when the result of the test is greater than the critical value. The critical value that is displayed is based on the degrees of freedom (dF) of the test and a significance level of 0.05.

Client: Camplin Environmental  
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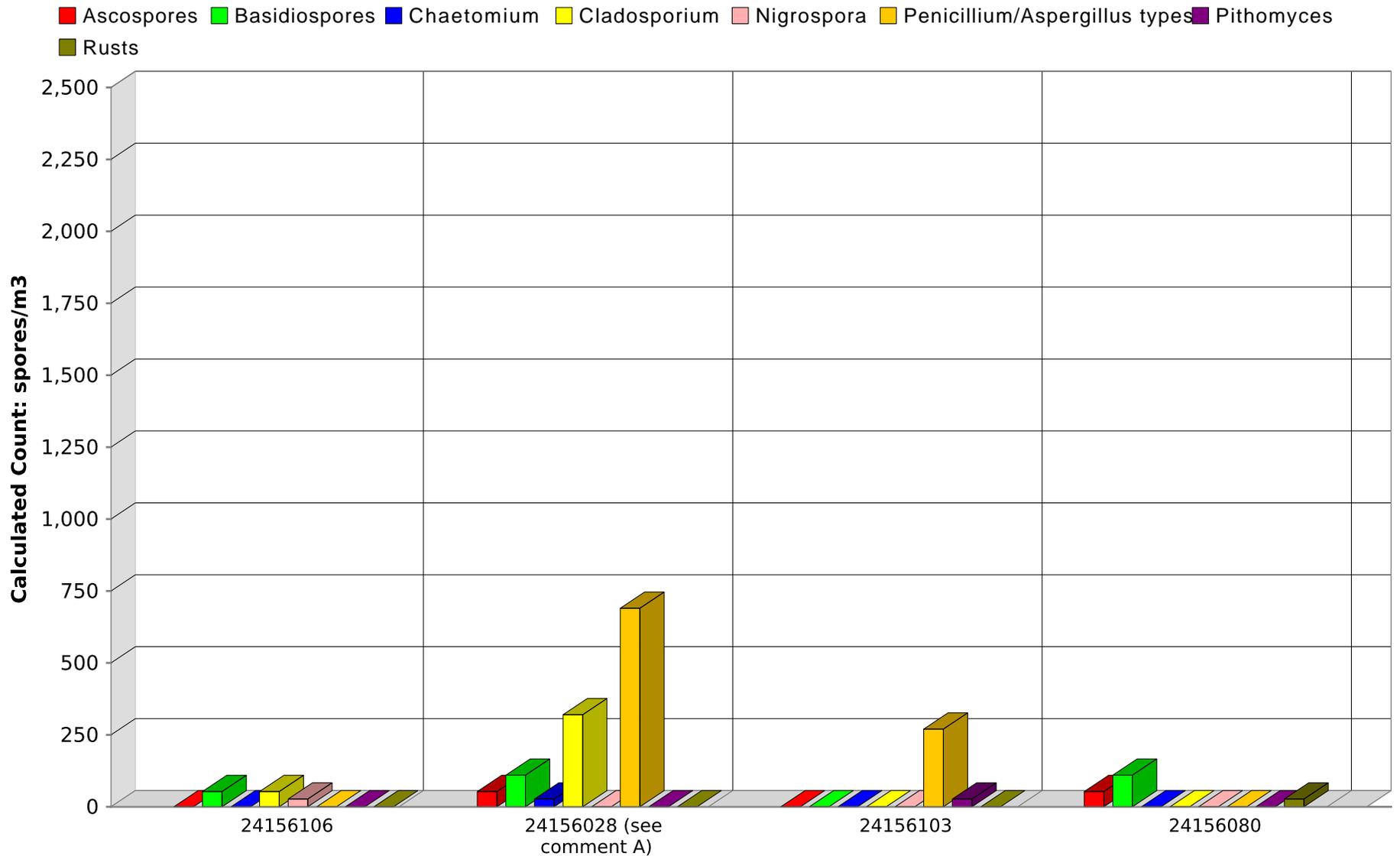
Date of Sampling: 08-09-2017  
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**MoldSTAT™: Supplementary Statistical Spore Trap Report**

\*\*\*\* MoldSCORE™ is a specialized method for examining air sampling data. It is a score between 100 and 300, with 100 indicating a greater likelihood that the airborne indoor spores originated from the outside, and 300 indicating a greater likelihood that they originated from an inside source. The Result displayed is based on the numeric score given and will be either Low, Medium, or High, indicating a low, medium, or high likelihood that the spores detected originated from an indoor source. EMLab P&K reserves the right to, and may at anytime, modify or change the MoldScore algorithm without notice.

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**SPORE TRAP REPORT: NON-VIABLE METHODOLOGY**

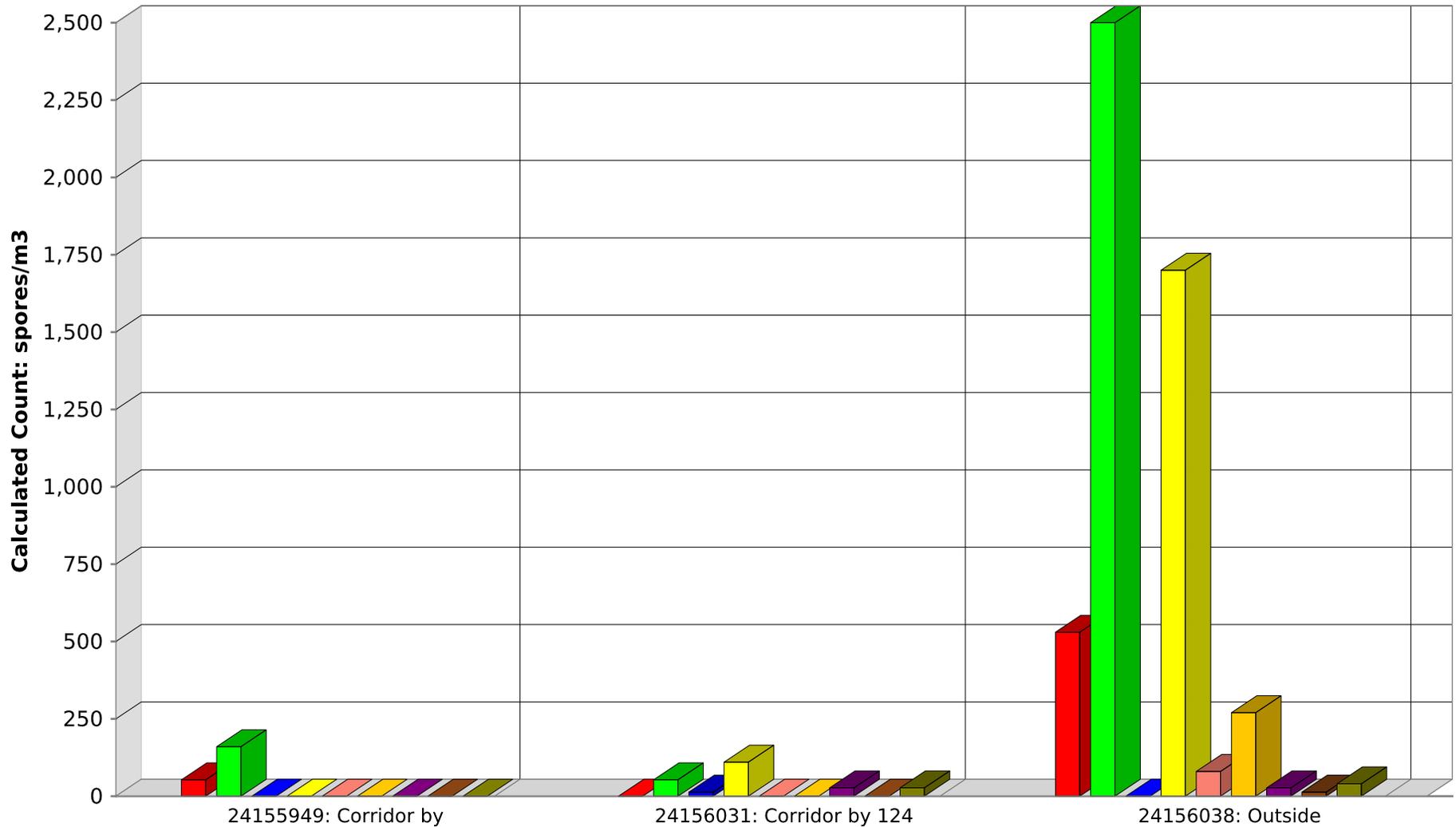


**Comments:** A) 20 of the raw count *Cladosporium* spores were present as a single clump.

Note: Graphical output may understate the importance of certain "marker" genera.  
 EMLab P&K, LLC

**SPORE TRAP REPORT: NON-VIABLE METHODOLOGY**

- Ascospores
- Basidiospores
- Chaetomium
- Cladosporium
- Epicoccum
- Penicillium/Aspergillus types
- Pithomyces
- Polythrincium
- Rusts



**Comments:**

Note: Graphical output may understate the importance of certain "marker" genera.  
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