

**FOLLOW-UP POST-REMEDIATION AIRBORNE MOLD
SAMPLING PROJECT REPORT**

**DOVE HILL ELEMENTARY SCHOOL
1460 COLT WAY
SAN JOSE, CA 95121**

CLASSROOMS 15, 17, 23, AND 25

**DOVE HILL ES WATER DAMAGED
CLASSROOMS REPAIR PROJECT – PART IV**

**Prepared for:
EVERGREEN ELEMENTARY SCHOOL DISTRICT
3188 QUIMBY ROAD
SAN JOSE, CA 95121**

MAY 24, 2018

HazMat Doc Project # 18-033

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HazMat Doc

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OVERVIEW

HazMat Doc (HMD) has completed a Follow-up Post-Remediation Airborne Mold Sampling Project at Moreland Middle School (MMS), located at 4600 Student Lane, San Jose, CA 95130. This Follow-Up Post-Remediation Project is for Part IV of the Dove Hill ES Water Damaged Classrooms Repair Project, and was response to a request by Mr. Rick Navarro, Director of Operations for the Evergreen Elementary School District (EESD). The work for Follow-up Post Remediation Project is further to the work included in the Part III Mold Remediation Post Clean-up Sampling and Management Project Report dated September 16, 2016, (HMD Project #16-041 Part III). Mr. Navarro and Mr. Michael Butler, EESD Construction Manager, our Site Contacts, made all the arrangements for access.

Part IV of the Project was for the follow-up air sampling that was recommended in the Part III Mold Remediation Post Clean-up Sampling and Management Report. Site work for Part IV was performed on February 21, 2018. This Sampling was for Classrooms 15 and 17 of the Classrooms 12-19 Building, and Classrooms 23 and 25 of the Classrooms 20-26 Building. The Classrooms 12-19 Building is in the center of the Campus and the Classrooms 20-26 Building is on the South-West side of the Campus.

ON-SITE OBSERVATIONS

Our technician made the following observations on-site on February 21, 2018:

- Chill, clear morning with moderate wind movement.
- No discernable odors were perceived in Classrooms 15, 17, 23, and 25.
- School was on break and maintenance staff were in process of cleaning the Classrooms.

WORK PERFORMED

On Site Direct Read

Our technician proceeded to perform indicator tests (i.e., Carbon Dioxide [CO₂] and Carbon Monoxide [CO]) for ventilation by way of an on-site, direct read *Vulcain™ SafetyPalm™* SP-IAQ4 instrument (Serial Number SP4-760). Temperature and relative humidity readings were also collected. Per the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) ANSI/ASHRAE Standard 62.1-2004 (Ventilation for Acceptable Air Quantity), the inside/outside variation should be within 400 parts per million. No anomalous readings were recorded. Please refer to the attached report.

Air-O-Cell™ Samples

A total of eight (8) samples were collected as part of this sampling as follows:

- (a) Interior sample collected in Classroom 15, North side, by the Sink counter;
- (b) Interior sample collected in Classroom 17, North side, by the Sink counter;
- (c) Interior sample collected in Classroom 23, East side, by the Sink counter;
- (d) Interior sample collected in Classroom 25, East side, by the Sink counter;
- (e) Exterior sample collected on the North-East side of Classroom 12;
- (f) Exterior sample collected on the South-West side of Classroom 19 (East of Classroom 26);
- (g) Exterior sample collected on the North side of Classroom 20; and
- (h) Exterior sample collected on South-East side of Classroom 32.

WORK PERFORMED (continued)**Air-O-Cell™ Samples (continued)**

HazMat Doc personnel performed air sampling by collecting air samples on spore traps for airborne fungal matter. The samples were collected using Zefon™ Air-O-Cell™ samplers. Air is drawn in at 15 liters per minute through an Air-O-Cell™ cassette for a 10-minute period. The particulate laden air enters the cassette, meets the sampling substance upon which it is impacted. The sampling substance is a special glass slide coated with an adherence medium. These cassettes are designed for the rapid collection and analysis of a wide range of airborne aerosols. These include mold spores, pollen, insect parts, skin cell fragments, fibers (e.g., asbestos, fiberglass, cellulose, clothing fibers) and inorganic particulate (e.g., ceramic, fly ash, combustion particles, copy toner).

Air-O-Cell™ Samples – Spore Trap Report

Inside and outside sampling is performed to detect the interior amplification (if any) of airborne fungal contaminants. Samples were collected from the outside location to account for any materials/spores that may be brought in by the HVAC unit.

Air-O-Cell™ Samples – Other Biological Particles Report

In addition to the Spore Trap report, the eight (8) air samples were also submitted to the laboratory for a report on other biological particles. A variety of pollen particles were isolated from the samples, however the heaviest concentration of materials isolated were epithelial (skin) cells. Please see the attached report.

SPECIES IDENTIFICATION

The following is a list and a definition of the species identified in the Spore Trap air samples:

Alternaria Species are cosmopolitan fungi of plants either as pathogens or as saprobes and from soil. *Alternaria* is a common and important allergen, including Type I allergies (hay fever, asthma) and Type III hypersensitivity pneumonitis (Woodworker's lung, Apple store hypersensitivity). *Alternaria Species* are occasional agents of onychomycosis, of ulcerated cutaneous infection and of sinusitis. Rare cases of infection have been reported in immunocompromised patients. (“*Significant Species*”)

- **These species were detected ONLY in the Interior air sample collected in Classroom 23.**
- **These species were NOT detected in the Interior air samples collected in Classrooms 15, 17, and 25, or in any of the Exterior air samples.**

Ascospores are ubiquitous and found everywhere in nature. *Ascospores* are produced by morels, truffles, cup fungi, ergot and many micro-fungi. They are frequently found growing indoors on damp substrates. Their allergenicity is highly variable, dependent on genus and species. *Ascospores* are a potential opportunist or pathogen dependent on species; however, the vast majority of these organisms do not cause disease. It should be noted that these organisms have been poorly studied. (“*Significant Species*”)

- **These species were detected in REDUCED levels in ALL the Interior air samples collected as compared to the Exterior air samples.**

SPECIES IDENTIFICATION (continued)

Aspergillus Species are cosmopolitan, saprobic fungi of soils (especially cultivated soils) and decomposing plant material. Some twenty species of *Aspergillus* have been recognized as opportunistic pathogens. In humans, the most common forms of aspergillosis are pulmonary in nature, although other deep infections are also encountered, particularly in immunocompromised patients. (“*Significant Species*”)

- **These species were detected in REDUCED levels in ALL the Interior air samples collected as compared to the Exterior air samples.**

Basidiospores are 'mushroom' spores. These spores are cosmopolitan and ubiquitous and consist of approximately 1,200 genera. Some forms (asexual) *Basidiospores* may cause rare and opportunistic infections. *Basidiospores* are commonly found in gardens, forests and woodlands. (“*Significant Species*”)

- **These species were detected in REDUCED levels in the Interior air samples collected in Classrooms 15, 17, and 23 as compared to the Exterior air samples.**
- **These species were NOT detected in the Interior air sample collected in Classroom 25.**

Cercospora Species are cosmopolitan mitosporic fungi, which use wind to disseminate dry spore. They are parasites of higher plants, causing leaf spot with approximately 2,000 form species described, according to plant host. The allergenicity of this species has not been studied, nor is the potential toxin production known. There is one report of human infection attributed to this species, in Indonesia, 1957. This species has not been seen growing indoors, although its presence is common outdoors in agricultural areas, especially during harvest. (“*Non-Significant Species*”)

- **These species were detected ONLY in the Interior air sample collected in Classroom 25.**
- **These species were NOT detected in the Interior air samples collected in Classrooms 15, 17, and 23, or in any of the Exterior air samples.**

Cladosporium Species are cosmopolitan fungi of soil, plant debris and leaf surfaces. *Cladosporium* is very frequently isolated from air, especially during seasons in which humidity is elevated. *Cladosporium* is generally non-pathogenic, but is a common and important allergen, including Type I allergies (hay fever, asthma) and Type III hypersensitivity pneumonitis (Hot tub lung, Moldy wall hypersensitivity). (“*Non-Significant Species*”)

- **These species were detected in REDUCED levels in ALL the Interior air samples collected as compared to the Exterior air samples.**

Myxomycetes - are ubiquitous and cosmopolitan and are of the taxonomical fungal category - slime molds. Most of these spore types are not seen with culturable methods (Anderson Sampling), although some may appear as non-sporulating fungi. *Myxomycetes* are found on decaying wood and dead leaves particularly in forested regions. *Myxomycetes* are a constituent of Type I allergies which include hay fever and asthma. *Myxomycetes* do not produce any potential toxins. (“*Non-Significant Species*”)

- **These species were detected in ELEVATED levels in the Interior air sample collected in Classroom 25 as compared to the Exterior air samples.**
- **These species were detected in EQUIVALENT levels in the Interior air samples collected in Classrooms 15 and 17 as compared to the Exterior air samples.**
- **These species were NOT detected in the Interior air sample collected in Classroom 23.**

SPECIES IDENTIFICATION (continued)

Other Brown types are spores with no distinct morphology. Health effects cannot be quantified. (“*Non-Significant Species*”)

- These species were detected in ELEVATED levels in the Interior air sample collected in Classroom 15 as compared to the Exterior air samples.
- These species were detected in EQUIVALENT levels in the Interior air sample collected in Classroom 25 as compared to the Exterior air samples.
- These species were NOT detected in the Interior air samples collected in Classrooms 17 and 23.

Penicillium Species are cosmopolitan predominant in regions of temperate climate. *Penicillia* figure among the most common types of fungi isolated from the environment, some are commonly implicated in the deterioration of food products. (“*Significant Species*”)

- These species were detected in REDUCED levels in ALL the Interior air samples collected as compared to the Exterior air samples.

Periconia Species are cosmopolitan predominant in soil, rotting vegetative matter, it is almost always associated with other fungi. Most of these spore types are not seen with culturable methods (Anderson Sampling), although some may appear as non-sporulating fungi. The allergenicity has not been studied of this species however; rare cases of mycotic keratitis have been reported. *Periconia Species* are rarely found growing indoors. (“*Significant Species*”)

- These species were detected in ELEVATED levels in the Interior air sample collected in Classroom 25 as compared to the Exterior air samples.
- These species were detected in EQUIVALENT levels in the Interior air samples collected in Classrooms 15 and 17 as compared to the Exterior air samples.
- These species were NOT detected in the Interior air sample collected in Classroom 23.

Rusts are ubiquitous and cosmopolitan with approximately 14 families and 105 genera and 5,000 species. *Rusts* are found on grasses, flowers, trees and other living plants. *Rusts* are a constituent for Type I allergies which include hay fever and asthma. The potential toxin production of *Rusts* is unknown; however, no cases of infection have been recorded in humans or animals. *Rusts* are plant pathogens. (“*Non-Significant Species*”)

- These species were detected ONLY in the Interior air samples collected in Classrooms 17 and 25.
- These species were NOT detected in the Interior air samples collected in Classrooms 15 and 23, or in any of the Exterior air samples.

Smuts – Most of these spore types are not seen with culturable methods (Anderson Sampling), although some may appear as non-sporulating fungi. *Smuts* are a constituent of Type I allergies which include hay fever and asthma. There have been no reports of human infection by the plant parasitic forms. (“*Non-Significant Species*”)

- These species were detected in ELEVATED levels in the Interior air sample collected in Classroom 25 as compared to the Exterior air samples.
- These species were detected in EQUIVALENT levels in the Interior air samples collected in Classrooms 15 and 17 as compared to the Exterior air samples.
- These species were NOT detected in the Interior air sample collected in Classroom 23.

SAMPLING SUMMARY

Air Sampling – Spore Trap

Significant mold genera are those that have known historical incidents of acute allergenicity or infection in humans. Non-significant mold genera are those that have no known historical incidents of allergenicity or infection in humans. Please note: all of the species identified in the air sampling may have some level of allergenicity.

Significant Mold Genera:

Six (6) significant mold genera were identified during this sampling:

- ❖ Two (2) significant mold genera identified, (*Alternaria Sp.*, *Periconia Sp.*), indicated ELEVATIONS in two (2) Classrooms as compared to the Exterior air samples; the other locations either indicated a reduction or were not detected in the samples. (*Alternaria Sp. Elevated in Classroom 23 only; Periconia Sp. Elevated in Classroom 25 only, and Equivalent in Classrooms 15 and 17 only*)
- ❖ Four (4) significant mold genera identified, (*Ascospores Sp.*, *Aspergillus Sp.*, *Basidiospores Sp.*, *Penicillium Sp.*), indicated a REDUCTION in the Interior air samples as compared to Exterior air sample or were NOT detected on the Interior air samples. (*Ascospores Sp. Reduced in Classrooms 15, 17, 23, and 25 only; Aspergillus Sp. Reduced in Classrooms 15, 17, 23, and 25 only; Basidiospores Sp. Reduced in Classrooms 15, 17, and 23 only; Penicillium Sp. Reduced in Classrooms 15, 17, 23, and 25 only.*)

Non-Significant Mold Genera

Six (6) non-significant mold genera were identified during this sampling:

- ❖ Five (5) non-significant mold genera identified, (*Cercospora Sp.*, *Myxomycetes Sp.*, *Other Brown Sp.*, *Rust Sp.*, and *Smuts Sp.*), indicated ELEVATIONS in two (2) Classrooms as compared to the Exterior air samples; the other locations either indicated a reduction or were not detected in the samples. (*Cercospora Sp. Elevated in Classroom 25 only; Myxomycetes Sp. Elevated in Classroom 25 only, and Equivalent in Classrooms 15 and 17 only; Other Brown Sp. Elevated in Classroom 15 only, and Equivalent in Classroom 15 only; Rusts Sp. Elevated in Classrooms 17 and 25 only; Smuts Sp. Elevated in Classroom 25 only, and Equivalent in Classrooms 15 and 17 only*)
- ❖ One (1) non-significant mold genera identified, (*Cladosporium Sp.*), indicated a REDUCTION in the Interior air samples as compared to Exterior air samples. (*Cladosporium Sp. Reduced in Classrooms 15, 17, 23, 25 only*)

Air Sampling – Other Biologicals

Twelve (12) Other Biological Particles were identified.

SAMPLING SUMMARY

Air Sampling – Other Biologicals (continued)

- ❖ Four (4) of the Other Biological Particles identified, [OTHER PARTICLES: ANIMAL-Epithelial(Skin); OTHER PARTICLES: NON-BIOLOGICAL-Cellulose fibers; OTHER PARTICLES: NON-BIOLOGICAL-Starch particles, and OTHER PARTICLES: NON-BIOLOGICAL-Synthetic fibers], indicated an ELEVATION in the Interior air samples as compared to the Exterior air samples. (*OTHER PARTICLES: ANIMAL-Epithelial(Skin); OTHER Elevated in Classrooms 15, 17, 23, and 25 only; OTHER PARTICLES: NON-BIOLOGICAL-Cellulose fibers Elevated in Classrooms 15, 17, 23, and 25 only; OTHER PARTICLES: NON-BIOLOGICAL-Starch particles Elevated in Classroom 17 only; and OTHER PARTICLES: NON-BIOLOGICAL-Synthetic fibers Elevated in Classrooms 15, 17, 23, and 25 only*)
- ❖ Five (5) Other Biological Particles identified, [POLLEN: Other; OTHER PLANT: Other (wood, trichomes, etc.); OTHER PARTICLES: FUNGI-Hyphal Fragments; OTHER PARTICLES: NON-BIOLOGICAL-Glass fiber; and OTHER PARTICLES: NON-BIOLOGICAL-Starch particles], were either detected in REDUCED/EQUIVALENT levels the Interior air samples collected, or were NOT detected in the Interior air samples. (*POLLEN: Other Equivalent in Classroom 25 only; OTHER PLANT: Other (wood, trichomes, etc.) Reduced in Classrooms 15, 17, 23, and 25 only; OTHER PARTICLES: FUNGI-Hyphal Fragments Reduced in Classrooms 15, 23, and 25 only; OTHER PARTICLES: NON-BIOLOGICAL-Glass fiber Reduced in Classroom 15 and Equivalent in Classroom 25 only; and OTHER PARTICLES: NON-BIOLOGICAL-Starch particles Reduced in Classroom 15 only*)
- ❖ Four (4) of the Other Biological Particles identified, [POLLEN: Oak (Quercus); POLLEN: Pine (Pinac); OTHER PLANT: Algae; and OTHER PARTICLES: ANIMAL-Insect Parts], were ONLY detected in the Exterior air samples collected, and were NOT detected in the Interior air samples.

RECOMMENDATIONS

While the total spore count for the samples collected inside the Classrooms are lower than the samples collected from the Exterior and no visible signs of water damage or suspect “mold growth” were present at the time of the Site Visit, we are concerned with:

- a. the “anomalous” readings of Significant Mold General in Classrooms 23 and 25;
- b. the “anomalous” reading of Non-Significant Mold Genera in Classroom 15; and
- c. the overall levels of Other Biological Particles found throughout all of the Classrooms included in this Sampling.

To address these concerns, would we like to recommend the following:

1. Weather permitting, these Classrooms should be given a good airing out to help disperse any accumulated odors inside the Classrooms.
2. The ventilation system should be kept on a “continuous flow” cycle at all times during working hours. The fresh air damper of the unit should be set to maximize the fresh air intake into the work areas. The American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) ANSI/ASHRAE Standard 62.1 – 2016, Ventilation for Acceptable Air Quantity, recommends at least 15 cfm per person (8 liters per second per person) of outside air be delivered, in all occupied classroom areas.

RECOMMENDATIONS *(continued)*

3. If the District is not already doing so, while these rooms are occupied, the HVAC system should be examined to ensure that it is operating at the Manufacturer's suggested capacity for the installation on a regular maintenance cycle. The filters should be checked to make sure there is no impediment to adequate air flow for the system. This recommendation is being made to address items a-c above.
4. If the District is not already doing so, while these rooms are occupied, the HVAC filters should be replaced on a regular cycle, at a minimum in accordance with the HVAC unit manufacturer's recommended replacement cycle. At the time of replacement on the manufacturer's cycle, if it is found that the filters are heavily clogged, the District may want to increase the frequency of replacement to compensate. This recommendation is being made to address items a-c above.
5. The housekeeping of the Classrooms, while visibly acceptable, could benefit from additional cleaning, especially while these rooms are occupied. This recommendation is being made because of the level of mold spores and particulates detected on the Interior air samples. For any areas with elevated levels of mold spores and/or particulates, if not already employing such units, the District may consider using a HEPA filter equipped vacuum cleaner. This could prevent the airborne dissipation of material collected by regular vacuuming. This recommendation is being made to address items a-c above.
6. After all the Classrooms on Campus have been given a thorough deep cleaning during the summer break of 2018, Classrooms 23 and 25 should be re-sampled to help assess if the detected anomalous Significant Mold Genera was cause by passive transference of the room occupants, and/or carried in through open doors/windows, or if there is actual concealed Interior source.
7. Although Classroom 15 only indicated anomalous readings for Non-Significant Mold Genera, (Mold Genera with no history of infections in humans), the District may consider having this room re-sampled as well after the summer break of 2018 deep cleaning, again to help assess if the detected anomalous Non-Significant Mold Genera was cause by passive transference of the room occupants, and/or carried in through open doors/windows, or if there is actual concealed Interior source.

DISCLAIMER & LIMITATIONS

Reasonable effort is made by HazMat Doc personnel to locate and sample suspect fungal/mold growth. However, for any facility the existence of unique or concealed fungal/mold growth is a possibility. Conditions of fungal/mold growth can change in short periods of time due to water intrusion, environmental conditions and other factors. In addition, sampling and laboratory analysis constraints typically hinder the investigation. Results of this report represent the conditions at the time of the investigation and sampling only. HazMat Doc does not warrant, guarantee or profess to have the ability to locate or identify all mold and fungi in a facility. Guarantees or assurances against errors and omissions are not expressed or implied

HazMat Doc

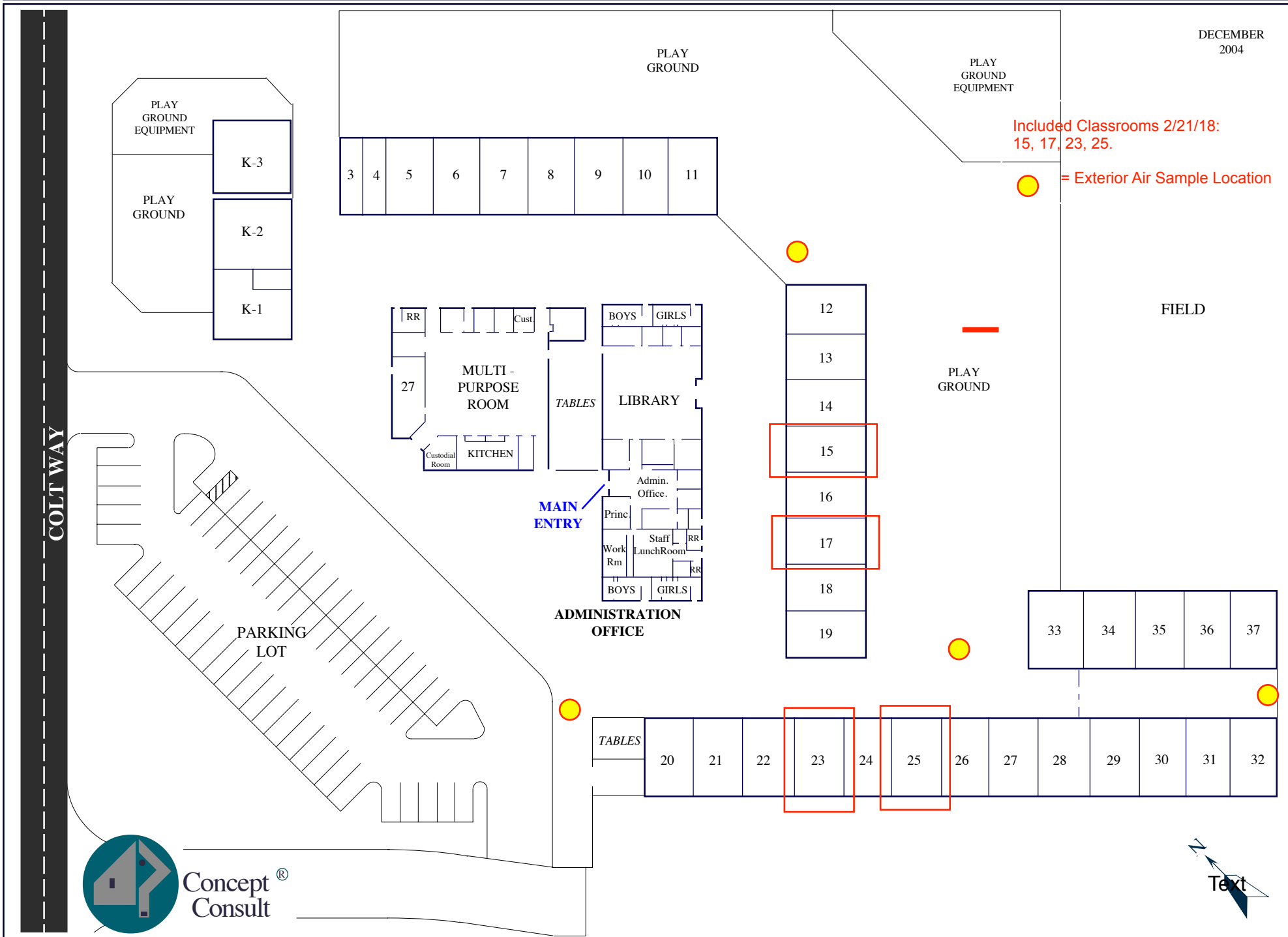


**Zen Doctor,
Project Manager**

References: (1) Identifying Filamentous Fungi. Guy St-Germain & Richard Summerbell,
© Star Publishing Co.
(2) Environmental Microbiology Laboratory, Inc., San Bruno, CA

PART – II

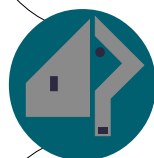
DECEMBER
2004



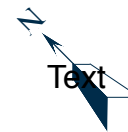
Included Classrooms 2/21/18:
15, 17, 23, 25.

○ = Exterior Air Sample Location

COLT WAY



Concept
Consult®



ONSITE DIRECT READ RESULTS

PROJECT #: 18-033

DATE: 2/21/18

LOCATION: DOVE HILL ES - CLASSROOMS 15, 17, 23, AND 25

AREA	TEST TYPE	RESULT (ppm)	TEMP (° C)	TEMP (° F)	HUMID (%)	COMMENTS
12-19 Building, CR 15, Interior, North Side by Sink Counter, Ambient	CO ₂	801	14.5	58.1	38	HVAC Off, Door Open and Windows Closed, 1 Adult, 0 Children Present
	CO	0				
12-19 Building, CR 17, Interior, North Side by Sink Counter, Ambient	CO ₂	819	13.8	56.8	41	HVAC Off, Door Open and Windows Closed, 1 Adult, 0 Children Present
	CO	0				
20-26 Building, CR 23, Interior, East Side by Sink Counter, Ambient	CO ₂	829	10.2	50.4	52	HVAC Off, Door Open and Windows Closed, 1 Adult, 0 Children Present
	CO	0				
20-26 Building, CR 25, Interior, East Side by Sink Counter, Ambient	CO ₂	806	9.9	49.8	50	HVAC Off, Door Open and Windows Closed, 1 Adult, 0 Children Present
	CO	0				
12-19 Building, Exterior, North-East of CR 12	CO ₂	771	12.2	54.0	40	Chill, Clear Morning, Moderate Breeze
	CO	0				
12-19 Building, Exterior, South-West of CR 19/ East of CR 26	CO ₂	789	11.3	52.3	44	Chill, Clear Morning, Moderate Breeze
	CO	0				

ONSITE DIRECT READ RESULTS

PROJECT #: 18-033

DATE: 2/21/18

LOCATION: DOVE HILLES - CLASSROOMS 15, 17, 23, AND 25

AREA	TEST TYPE	RESULT (ppm)	TEMP (° C)	TEMP (° F)	HUMID (%)	COMMENTS
20-26 Building, Exterior, North of CR 20	CO ₂	809	11.0	51.8	42	Chill, Clear Morning, Moderate Breeze
	CO	0				
27-32 Building, Exterior, South-East of CR 32	CO ₂	785	17.4	63.3	33	Chill, Clear Morning, Moderate Breeze
	CO	0				



Report for:

Ms. Maheen B. Doctor
HazMat Doc
3080 Olcott Street #D-135
Santa Clara, CA 95054

Regarding: Project: 18-033; Dove Hill ES
EML ID: 1882785

Approved by:

Dates of Analysis:
Spore trap analysis: 02-23-2018

Technical Manager
Murali Putty

Service SOPs: Spore trap analysis (EM-MY-S-1038)
AIHA-LAP, LLC accredited service, Lab ID #102856

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: HazMat Doc
C/O: Ms. Maheen B. Doctor
Re: 18-033; Dove Hill ES

Date of Sampling: 02-21-2018
Date of Receipt: 02-22-2018
Date of Report: 02-23-2018

SPORE TRAP REPORT: NON-VIABLE METHODOLOGY

Location:	25447701: INT., CR 15, east side, center		25447648: INT., CR 17, east side, center		25447643: INT., CR 23, north side, center		25447647: INT., CR 25, north side, center	
Comments (see below)	A		A		A		A	
Lab ID-Version‡:	8837033-1		8837035-1		8837037-1		8837039-1	
Analysis Date:	02/23/2018		02/23/2018		02/23/2018		02/23/2018	
	raw ct.	spores/m3	raw ct.	spores/m3	raw ct.	spores/m3	raw ct.	spores/m3
Alternaria					1	7		
Ascospores	2	53	2	53	4	110	4	110
Basidiospores	3	80	2	53	1	27		
Cercospora							1	7
Chaetomium								
Cladosporium	4	110	8	210	10	270	12	320
Fusarium								
Myrothecium								
Nigrospora								
Other brown	2	13					1	7
Other colorless								
Penicillium/Aspergillus types†	10	270	9	240	11	290	10	270
Pithomyces								
Rusts			1	7			3	20
Smuts, Periconia, Myxomycetes	1	7	1	7			3	20
Stachybotrys								
Stemphylium								
Torula								
Ulocladium								
Zygomycetes								
Background debris (1-4+)††	2+		2+		3+		3+	
Hyphal fragments/m3	7		< 7		7		7	
Pollen/m3	< 7		< 7		< 7		7	
Skin cells (1-4+)	1+		< 1+		< 1+		< 1+	
Sample volume (liters)	150		150		150		150	
§ TOTAL SPORES/m3		530		570		700		750

Comments: A) Secondary data review is delayed.

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/m³ divided by the raw count, expressed in spores/m³. The limit of detection is the analytical sensitivity (in spores/m³) 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/m³ has been rounded to two significant figures to reflect analytical precision.

Client: HazMat Doc
C/O: Ms. Maheen B. Doctor
Re: 18-033; Dove Hill ES

Date of Sampling: 02-21-2018
Date of Receipt: 02-22-2018
Date of Report: 02-23-2018

SPORE TRAP REPORT: NON-VIABLE METHODOLOGY

Location:	25447667: EXT., 12-19 Bldg., east of CR 12	25448119: EXT., 12-19 Bldg., south-west of CR 19/south-east of CR 26	25447171: EXT., 20-32 Bldg., north of CR20	25447658: EXT., 20-32 Bldg., south-east of 32				
Comments (see below)	A	B	C	A				
Lab ID-Version‡:	8837041-1	8837043-1	8837045-1	8837047-1				
Analysis Date:	02/23/2018	02/23/2018	02/23/2018	02/23/2018				
	raw ct.	spores/m3	raw ct.	spores/m3	raw ct.	spores/m3	raw ct.	spores/m3
Alternaria								
Ascospores	6	160	1	27	2	53	4	110
Basidiospores	5	130	3	80	2	53	9	240
Cercospora								
Chaetomium								
Cladosporium	9	240	8	210	14	370	13	350
Other brown	1	7			1	7		
Penicillium/Aspergillus types†	20	530	58	930	60	1,100	23	610
Pithomyces								
Rusts								
Smuts, Periconia, Myxomycetes	1	7			1	7		
Stachybotrys								
Stemphylium								
Torula								
Ulocladium								
Zygomycetes								
Background debris (1-4+)††	3+		3+		3+		3+	
Hyphal fragments/m3	33		7		< 7		20	
Pollen/m3	27		13		7		7	
Skin cells (1-4+)	< 1+		< 1+		< 1+		< 1+	
Sample volume (liters)	150		150		150		150	
§ TOTAL SPORES/m3		1,100		1,200		1,600		1,300

Comments: A) Secondary data review is delayed. B) 31 of the raw count *Penicillium/Aspergillus* type spores were present as a single clump. Secondary data review is delayed. C) 27 of the raw count *Penicillium/Aspergillus* type spores were present as a single clump. Secondary data review is delayed.

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/m³ divided by the raw count, expressed in spores/m³. The limit of detection is the analytical sensitivity (in spores/m³) 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/m³ has been rounded to two significant figures to reflect analytical precision.



Report for:

Ms. Maheen B. Doctor
HazMat Doc
3080 Olcott Street #D-135
Santa Clara, CA 95054

Regarding: Project: 18-033; Dove Hill ES
EML ID: 1882785

Approved by:

Technical Manager
Murali Putty

Dates of Analysis:

Spore trap analysis other particles-Supplement: 02-23-2018

Service SOPs: Spore trap analysis other particles-Supplement (EM-MY-S-1038)
AIHA-LAP, LLC accredited service, Lab ID #102856

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: HazMat Doc
C/O: Ms. Maheen B. Doctor
Re: 18-033; Dove Hill ES

Date of Sampling: 02-21-2018
Date of Receipt: 02-22-2018
Date of Report: 02-23-2018

OTHER BIOLOGICAL PARTICLES REPORT: NON-VIABLE METHODOLOGY

Location:	25447701: INT., CR 15, east side, center		25447648: INT., CR 17, east side, center		25447643: INT., CR 23, north side, center		25447647: INT., CR 25, north side, center	
Comments (see below)	A		A		A		A	
Lab ID-Version‡:	8837034-1		8837036-1		8837038-1		8837040-1	
	raw ct.	particles/m3	raw ct.	particles/m3	raw ct.	particles/m3	raw ct.	particles/m3
POLLEN								
Grass (Poaceae)								
Mulberry (Morus)								
Oak (Quercus)								
Other							1	7
Pine (Pinaceae)								
Ragweed (Ambrosieae)								
Sycamore (Platanus)								
OTHER PLANT								
Algae								
Diatoms								
Fern, moss, etc. spores								
Other (wood, trichomes, etc.)	4	27	5	33	3	20	2	13
OTHER PARTICLES:								
ANIMAL								
Epithelial (skin) cells	33	880	16	430	18	480	22	590
Hair								
Insect parts								
Mites								
FUNGI								
Hyphal fragments	1	7			1	7	1	7
NON-BIOLOGICAL								
Cellulose fibers	24	160	28	190	22	150	13	87
Glass fiber	1	7					2	13
Starch particles	1	7	3	20				
Synthetic fibers	8	53	19	130	9	60	3	20
Background debris (1-4+)†	2+		2+		3+		3+	
Sample volume (liters)	150		150		150		150	

Comments: A) Secondary data review is delayed.

The analytical sensitivity is the spores/m3 divided by the raw count. The limit of detection is the analytical sensitivity multiplied by the sample volume divided by 1000.

Carbonaceous particles include soot and other combustion products. In most instances a detailed analysis of soot can be accomplished using scanning electron microscopy.

Note: Interpretation is left to the company and/or persons who conducted the field work.

† Background debris is an indication of the amounts of non-biological particulate matter present on the slide (dust in the air) and is graded from 1+ to 4+ with 4+ indicating the largest amounts. To evaluate dust levels it is important to account for differences in sample volume.

‡ 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".

Client: HazMat Doc
C/O: Ms. Maheen B. Doctor
Re: 18-033; Dove Hill ES

Date of Sampling: 02-21-2018
Date of Receipt: 02-22-2018
Date of Report: 02-23-2018

OTHER BIOLOGICAL PARTICLES REPORT: NON-VIABLE METHODOLOGY

Location:	25447667: EXT., 12-19 Bldg., east of CR 12		25448119: EXT., 12-19 Bldg., south-west of CR 19/south-east of CR 26		25447171: EXT., 20-32 Bldg., north of CR20		25447658: EXT., 20-32 Bldg., south-east of 32	
Comments (see below)	A		A		A		A	
Lab ID-Version‡:	8837042-1		8837044-1		8837046-1		8837048-1	
	raw ct.	particles/m3	raw ct.	particles/m3	raw ct.	particles/m3	raw ct.	particles/m3
POLLEN								
Oak (Quercus)	1	7	1	7	1	7	1	7
Other			1	7				
Pine (Pinaceae)	3	20						
Ragweed (Ambrosieae)								
Sycamore (Platanus)								
OTHER PLANT								
Algae	1	7						
Diatoms								
Fern, moss, etc. spores								
Other (wood, trichomes, etc.)	5	33	3	20	6	40	2	13
OTHER PARTICLES:								
ANIMAL								
Epithelial (skin) cells	4	27	6	40	12	80	11	73
Hair								
Insect parts	1	7						
Mites								
FUNGI								
Hyphal fragments	5	33	1	7			3	20
NON-BIOLOGICAL								
Cellulose fibers	7	47	5	33	4	27	6	40
Glass fiber			2	13				
Starch particles	2	13	2	13			1	7
Synthetic fibers	3	20	2	13	1	7	2	13
Background debris (1-4+)†	3+		3+		3+		3+	
Sample volume (liters)	150		150		150		150	

Comments: A) Secondary data review is delayed.

The analytical sensitivity is the spores/m3 divided by the raw count. The limit of detection is the analytical sensitivity multiplied by the sample volume divided by 1000.

Carbonaceous particles include soot and other combustion products. In most instances a detailed analysis of soot can be accomplished using scanning electron microscopy.

Note: Interpretation is left to the company and/or persons who conducted the field work.

† Background debris is an indication of the amounts of non-biological particulate matter present on the slide (dust in the air) and is graded from 1+ to 4+ with 4+ indicating the largest amounts. To evaluate dust levels it is important to account for differences in sample volume.

‡ 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".
EMLab P&K, LLC

Client: HazMat Doc
C/O: Ms. Maheen B. Doctor
Re: 18-033; Dove Hill ES

Date of Sampling: 02-21-2018
Date of Receipt: 02-22-2018
Date of Report: 02-23-2018

MoldRANGE™, California Climate: Extended Outdoor Comparison

(Patent Pending)

Outdoor Location: 25447171, EXT., 20-32 Bldg., north of CR20

Fungi Identified	Outdoor data	Typical Outdoor Data for: February in California† Köppen-Geiger climate code! "Csb" Mediterranean/cool summer (n‡=884)						Typical Outdoor Data for: The entire year in California† Köppen-Geiger climate code! "Csb" Mediterranean/cool summer (n‡=10221)					
		very low	low	med	high	very high	freq %	very low	low	med	high	very high	freq %
Project zip code 95121	spores/m3												
Generally able to grow indoors*													
Alternaria	-	13	13	13	53	72	30	13	13	27	63	110	51
Bipolaris/Drechslera group	-	7	13	13	13	27	5	7	11	13	27	40	8
Chaetomium	-	8	13	13	27	37	8	7	13	13	27	50	19
Cladosporium	370	110	160	520	1,500	2,700	94	110	250	750	2,000	3,400	97
Curvularia	-	-	-	-	-	-	< 1	7	13	13	22	48	3
Nigrospora	-	11	13	13	13	25	4	7	13	13	27	53	8
Other brown	7	11	13	13	38	53	29	10	13	13	40	53	38
Penicillium/Aspergillus types	1,100	53	110	270	750	1,300	83	53	110	270	750	1,200	82
Stachybotrys	-	-	-	-	-	-	2	7	13	13	27	67	4
Torula	-	13	13	13	40	85	5	7	13	13	40	53	12
Seldom found growing indoors**													
Ascospores	53	53	100	390	1,200	2,200	87	50	53	210	700	1,400	82
Basidiospores	53	110	270	1,300	4,200	7,300	98	53	110	460	2,100	4,400	95
Cercospora	-	-	-	-	-	-	2	7	13	13	27	40	2
Rusts	-	7	13	13	40	80	16	8	13	25	53	110	34
Smuts, Periconia, Myxomycetes	7	13	13	27	67	110	60	13	13	40	120	210	71
§ TOTAL SPORES/m3	1,600												

†Köppen-Geiger climate codes are based upon a climate classification scheme for large geographic areas. The "MoldRANGE, California Climate" report uses the sampling location zipcode to identify the Köppen-Geiger climate code in that area. Because California has such diverse climates, this approach 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 Köppen-Geiger climate classification system can be found on the last page of this report.

‡The Typical Outdoor Data represents the typical outdoor spore levels across North America for the time period and 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 enough data is not available to make a statistically meaningful assessment, it is indicated with a dash.

‡ n is the sample size used to calculate the MoldRange, California 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.

Client: HazMat Doc
C/O: Ms. Maheen B. Doctor
Re: 18-033; Dove Hill ES

Date of Sampling: 02-21-2018
Date of Receipt: 02-22-2018
Date of Report: 02-23-2018

MoldRANGE™, California Climate: Extended Outdoor Comparison

(Patent Pending)

Outdoor Location: 25447658, EXT., 20-32 Bldg., south-east of 32

Fungi Identified	Outdoor data	Typical Outdoor Data for: February in California† Köppen-Geiger climate code! "Csb" Mediterranean/cool summer (n‡=884)						Typical Outdoor Data for: The entire year in California† Köppen-Geiger climate code! "Csb" Mediterranean/cool summer (n‡=10221)					
		very low	low	med	high	very high	freq %	very low	low	med	high	very high	freq %
Project zip code 95121	spores/m3												
Generally able to grow indoors*													
Alternaria	-	13	13	13	53	72	30	13	13	27	63	110	51
Bipolaris/Drechslera group	-	7	13	13	13	27	5	7	11	13	27	40	8
Chaetomium	-	8	13	13	27	37	8	7	13	13	27	50	19
Cladosporium	350	110	160	520	1,500	2,700	94	110	250	750	2,000	3,400	97
Curvularia	-	-	-	-	-	-	< 1	7	13	13	22	48	3
Nigrospora	-	11	13	13	13	25	4	7	13	13	27	53	8
Other brown	-	11	13	13	38	53	29	10	13	13	40	53	38
Penicillium/Aspergillus types	610	53	110	270	750	1,300	83	53	110	270	750	1,200	82
Stachybotrys	-	-	-	-	-	-	2	7	13	13	27	67	4
Torula	-	13	13	13	40	85	5	7	13	13	40	53	12
Seldom found growing indoors**													
Ascospores	110	53	100	390	1,200	2,200	87	50	53	210	700	1,400	82
Basidiospores	240	110	270	1,300	4,200	7,300	98	53	110	460	2,100	4,400	95
Cercospora	-	-	-	-	-	-	2	7	13	13	27	40	2
Rusts	-	7	13	13	40	80	16	8	13	25	53	110	34
Smuts, Periconia, Myxomycetes	-	13	13	27	67	110	60	13	13	40	120	210	71
§ TOTAL SPORES/m3	1,300												

†Köppen-Geiger climate codes are based upon a climate classification scheme for large geographic areas. The "MoldRANGE, California Climate" report uses the sampling location zipcode to identify the Köppen-Geiger climate code in that area. Because California has such diverse climates, this approach 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 Köppen-Geiger climate classification system can be found on the last page of this report.

‡The Typical Outdoor Data represents the typical outdoor spore levels across North America for the time period and 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 enough data is not available to make a statistically meaningful assessment, it is indicated with a dash.

‡ n is the sample size used to calculate the MoldRange, California 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.

Client: HazMat Doc
C/O: Ms. Maheen B. Doctor
Re: 18-033; Dove Hill ES

Date of Sampling: 02-21-2018
Date of Receipt: 02-22-2018
Date of Report: 02-23-2018

Understanding Köppen-Geiger Climate Codes

Outdoor airborne fungal 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 cycles of plants, thereby influencing fungal growth, spore maturation and release cycles. By evaluating outdoor spore concentration across similar climatic zones, rather than for the state as a whole, it is possible to provide a more precise and reliable estimate of typical outdoor spore levels and the frequency of occurrence for different airborne fungal spore types in a given area.

A widely used system for classifying climate was developed in the late nineteenth century by the climatologist Wladimir Köppen. He later collaborated with another climatologist Rudolf Geiger in making modifications to his original system. As new climatic data has become available other individuals have submitted revisions and modifications to this system which are commonly referred to as modified Köppen-Geiger climate classification systems.

The Köppen-Geiger climate classification system is a widely used system that provides an objective numerical definition of climate types in terms of climatic elements such as temperature, rainfall, and other seasonal characteristics. The modified Köppen-Geiger climate classification system adopted here includes 6 major climate categories designated by a capital letter:

- A Tropical
- B Dry
- C Mediterranean (Temperate)
- D Continental (Temperate)
- E Polar
- H Timberline

In order to represent the main climatic types, additional letter designations are added. Except for the Dry climates and Polar climates the second letter refers to rainfall regime. The second letter for Dry climates differentiates Dry Steppe climates from Dry Desert climates. The second letter for Polar climates differentiates Polar Tundra climates from Polar Ice climates. For all 6 major climate categories the third letter refers to temperature characteristics, and the fourth to special features of the climate.

California is unique in that it has a more diverse array of climate types than any other state. Based upon data mapped by the California Department of Fish and Game (2003), California displays 11 distinct climate types as defined by a modified Köppen-Geiger climate classification system:

- BSh Semi-arid, steppe hot
- BSk Semi-arid, steppe
- BSkn Semi-arid, steppe w/summer fog
- BWh Arid low latitude desert hot
- BWk Arid mid latitude desert
- Csa Mediterranean/hot summer
- Csb Mediterranean/cool summer
- Csbn Mediterranean/summer fog
- Dsb Cool continental/dry summer
- Dsc Cold winter/dry summer
- H Highland/Timberline

This report groups California zip codes in relation to these climate codes and summarizes the MoldRANGE™ data by month and by year within each climate code.

REFERENCES

California Department of Fish and Game, Atlas of the Biodiversity of California, p. 15, 2003.
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.

Client: HazMat Doc
 C/O: Ms. Maheen B. Doctor
 Re: 18-033; Dove Hill ES

Date of Sampling: 02-21-2018
 Date of Receipt: 02-22-2018
 Date of Report: 02-23-2018

MoldSTAT™: Supplementary Statistical Spore Trap Report

Outdoor Summary: 25447171: EXT., 20-32 Bldg., north of CR20

Species detected	Outdoor sample spores/m3				Typical outdoor ranges (North America)	Freq. %
	<100	1K	10K	>100K		
Ascospores					13 - 230 - 6,400	77
Basidiospores					13 - 470 - 23,000	91
Cladosporium					27 - 510 - 9,400	90
Other brown					7 - 20 - 150	26
Penicillium/Aspergillus types					13 - 190 - 2,600	67
Smuts, Periconia, Myxomycetes					7 - 53 - 1,100	65
Total						

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: 25447701: INT., CR 15, east side, center

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)
Result: 33%	dF: 5 Result: 5.5238 Critical value: 11.0705 Inside Similar: Yes	Result: 1.0000	dF: 6 Result: 0.9714 Critical value: 0.7714 Outside Similar: Yes	Score: 107 Result: Low
Species Detected	Spores/m3			
	<100	1K	10K	>100K
Ascospores				
Basidiospores				
Cladosporium				
Other brown				
Penicillium/Aspergillus types				
Smuts, Periconia, Myxomycetes				
Total				

Client: HazMat Doc
 C/O: Ms. Maheen B. Doctor
 Re: 18-033; Dove Hill ES

Date of Sampling: 02-21-2018
 Date of Receipt: 02-22-2018
 Date of Report: 02-23-2018

MoldSTAT™: Supplementary Statistical Spore Trap Report

Location: 25447648: INT., CR 17, east side, center

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 35%	dF: 5 Result: 5.5238 Critical value: 11.0705 Inside Similar: Yes	Result: 0.8333	dF: 7 Result: 0.9196 Critical value: 0.6786 Outside Similar: Yes	Score: 107 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
Ascospores					53
Basidiospores					53
Cladosporium					210
Penicillium/Aspergillus types					240
Rusts					7
Smuts, Periconia, Myxomycetes					7
Total					570

Location: 25447643: INT., CR 23, north side, center

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 44%	dF: 5 Result: 5.5238 Critical value: 11.0705 Inside Similar: Yes	Result: 0.7273	dF: 7 Result: 0.8839 Critical value: 0.6786 Outside Similar: Yes	Score: 109 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
Alternaria					7
Ascospores					110
Basidiospores					27
Cladosporium					270
Penicillium/Aspergillus types					290
Total					700

Client: HazMat Doc
 C/O: Ms. Maheen B. Doctor
 Re: 18-033; Dove Hill ES

Date of Sampling: 02-21-2018
 Date of Receipt: 02-22-2018
 Date of Report: 02-23-2018

MoldSTAT™: Supplementary Statistical Spore Trap Report

Location: 25447647: INT., CR 25, north side, center

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 47%	dF: 5 Result: 5.5238 Critical value: 11.0705 Inside Similar: Yes	Result: 0.7692	dF: 8 Result: 0.5893 Critical value: 0.6190 Outside Similar: No	Score: 112 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
Ascospores					110
Cercospora					7
Cladosporium					320
Other brown					7
Penicillium/Aspergillus types					270
Rusts					20
Smuts, Periconia, Myxomycetes					20
Total					750

Location: 25447667: EXT., 12-19 Bldg., east of CR 12

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 67%	dF: 5 Result: 5.5238 Critical value: 11.0705 Inside Similar: Yes	Result: 1.0000	dF: 6 Result: 0.9857 Critical value: 0.7714 Outside Similar: Yes	Score: 111 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
Ascospores					160
Basidiospores					130
Cladosporium					240
Other brown					7
Penicillium/Aspergillus types					530
Smuts, Periconia, Myxomycetes					7
Total					1,100

Client: HazMat Doc
 C/O: Ms. Maheen B. Doctor
 Re: 18-033; Dove Hill ES

Date of Sampling: 02-21-2018
 Date of Receipt: 02-22-2018
 Date of Report: 02-23-2018

MoldSTAT™: Supplementary Statistical Spore Trap Report

Location: 25448119: EXT., 12-19 Bldg., south-west of CR 19/south-east of CR 26

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 78%	dF: 5 Result: 5.5238 Critical value: 11.0705 Inside Similar: Yes	Result: 0.8000	dF: 6 Result: 0.9857 Critical value: 0.7714 Outside Similar: Yes	Score: 139 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
Ascospores					27
Basidiospores					80
Cladosporium					210
Penicillium/Aspergillus types					930
Total					1,200

* 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.

**** 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.

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 ranges" 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. With the statistical analysis provided, as with all statistical comparisons and analyses, false-positive and false-negative results can and do occur. EMLab P&K hereby disclaims any liability for any and all direct, indirect, punitive, incidental, special or consequential damages arising out of the data contained in, or any actions taken or omitted in reliance upon, this report.

Client: HazMat Doc
 C/O: Ms. Maheen B. Doctor
 Re: 18-033; Dove Hill ES

Date of Sampling: 02-21-2018
 Date of Receipt: 02-22-2018
 Date of Report: 02-23-2018

MoldSTAT™: Supplementary Statistical Spore Trap Report

Outdoor Summary: 25447658: EXT., 20-32 Bldg., south-east of 32

Species detected	Outdoor sample spores/m3				Typical outdoor ranges (North America)	Freq. %
	<100	1K	10K	>100K		
Ascospores				110	13 - 230 - 6,400	77
Basidiospores				240	13 - 470 - 23,000	91
Cladosporium				350	27 - 510 - 9,400	90
Penicillium/Aspergillus types				610	13 - 190 - 2,600	67
Smuts, Periconia, Myxomycetes				<7	7 - 53 - 1,100	65
Total				1,300		

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: 25447701: INT., CR 15, east side, center

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)
Result: 40%	dF: 5 Result: 5.5238 Critical value: 11.0705 Inside Similar: Yes	Result: 0.8000	dF: 6 Result: 0.9857 Critical value: 0.7714 Outside Similar: Yes	Score: 117 Result: Low

Species Detected	Spores/m3			
	<100	1K	10K	>100K
Ascospores				53
Basidiospores				80
Cladosporium				110
Other brown				13
Penicillium/Aspergillus types				270
Smuts, Periconia, Myxomycetes				7
Total				530

Client: HazMat Doc
 C/O: Ms. Maheen B. Doctor
 Re: 18-033; Dove Hill ES

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Location: 25447648: INT., CR 17, east side, center

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 43%	dF: 5 Result: 5.5238 Critical value: 11.0705 Inside Similar: Yes	Result: 0.8000	dF: 6 Result: 0.9857 Critical value: 0.7714 Outside Similar: Yes	Score: 111 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
	Ascospores				53
	Basidiospores				53
	Cladosporium				210
	Penicillium/Aspergillus types				240
	Rusts				7
	Smuts, Periconia, Myxomycetes				7
	Total				570

Location: 25447643: INT., CR 23, north side, center

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 53%	dF: 5 Result: 5.5238 Critical value: 11.0705 Inside Similar: Yes	Result: 0.8889	dF: 5 Result: 0.9000 Critical value: 0.8000 Outside Similar: Yes	Score: 112 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
	Alternaria				7
	Ascospores				110
	Basidiospores				27
	Cladosporium				270
	Penicillium/Aspergillus types				290
	Total				700

Client: HazMat Doc
 C/O: Ms. Maheen B. Doctor
 Re: 18-033; Dove Hill ES

Date of Sampling: 02-21-2018
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MoldSTAT™: Supplementary Statistical Spore Trap Report

Location: 25447647: INT., CR 25, north side, center

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 57%	dF: 5 Result: 5.5238 Critical value: 11.0705 Inside Similar: Yes	Result: 0.5455	dF: 8 Result: 0.5714 Critical value: 0.6190 Outside Similar: No	Score: 112 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
Ascospores					110
Cercospora					7
Cladosporium					320
Other brown					7
Penicillium/Aspergillus types					270
Rusts					20
Smuts, Periconia, Myxomycetes					20
Total					750

Location: 25447667: EXT., 12-19 Bldg., east of CR 12

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 81%	dF: 5 Result: 5.5238 Critical value: 11.0705 Inside Similar: Yes	Result: 0.8000	dF: 6 Result: 0.9429 Critical value: 0.7714 Outside Similar: Yes	Score: 132 Result: Low	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
Ascospores					160
Basidiospores					130
Cladosporium					240
Other brown					7
Penicillium/Aspergillus types					530
Smuts, Periconia, Myxomycetes					7
Total					1,100

Client: HazMat Doc
 C/O: Ms. Maheen B. Doctor
 Re: 18-033; Dove Hill ES

Date of Sampling: 02-21-2018
 Date of Receipt: 02-22-2018
 Date of Report: 02-23-2018

MoldSTAT™: Supplementary Statistical Spore Trap Report

Location: 25448119: EXT., 12-19 Bldg., south-west of CR 19/south-east of CR 26

% of outdoor total spores/m3	Friedman chi-square* (indoor variation)	Agreement ratio** (indoor/outdoor)	Spearman rank correlation*** (indoor/outdoor)	MoldSCORE**** (indoor/outdoor)	
Result: 95%	dF: 5 Result: 5.5238 Critical value: 11.0705 Inside Similar: Yes	Result: 1.0000	dF: 4 Result: 1.0000 Critical value: N/A Outside Similar: N/A	Score: 184 Result: Medium	
Species Detected		Spores/m3			
		<100	1K	10K	>100K
Ascospores					27
Basidiospores					80
Cladosporium					210
Penicillium/Aspergillus types					930
Total					1,200

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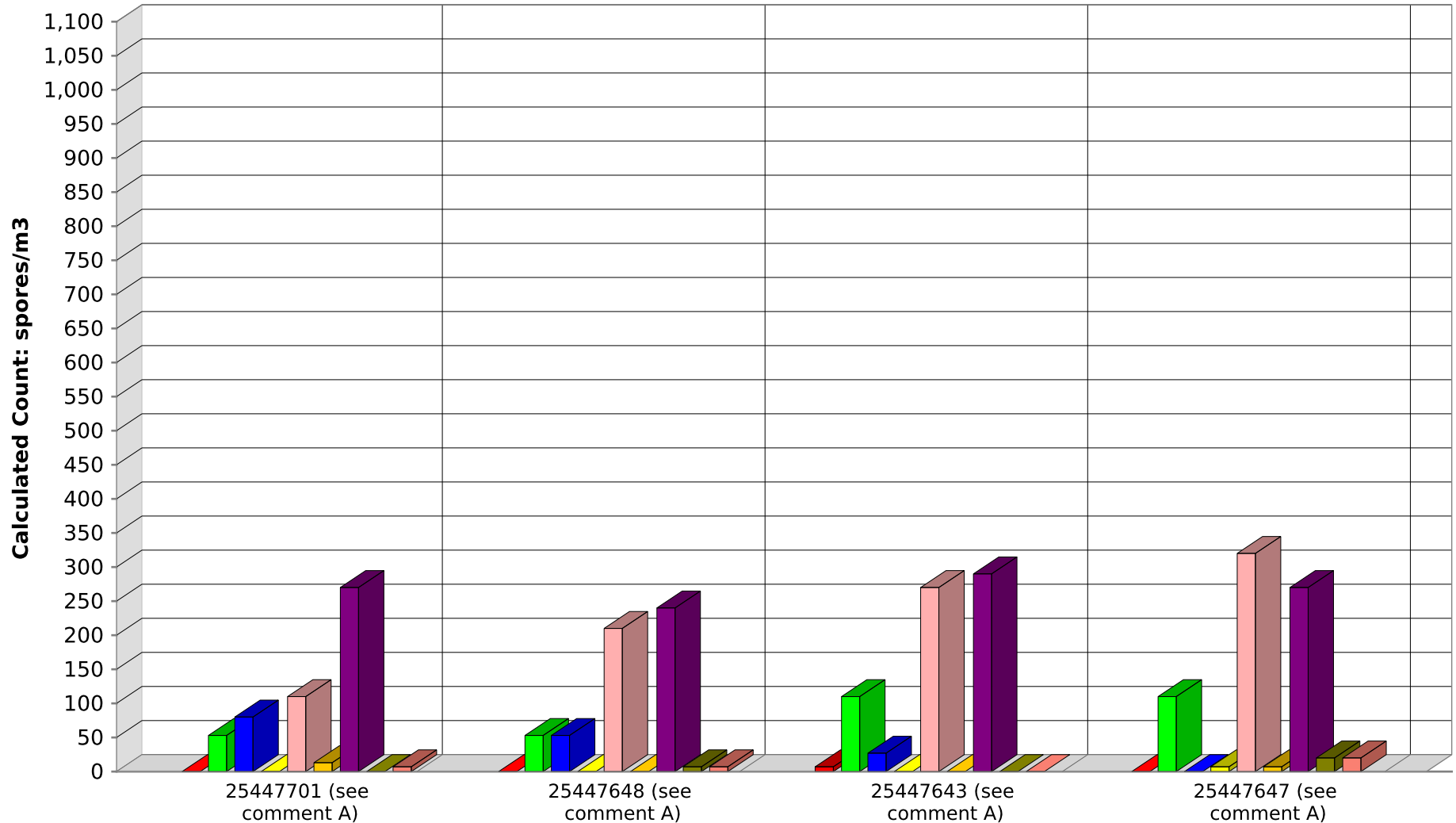
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SPORE TRAP REPORT: NON-VIABLE METHODOLOGY

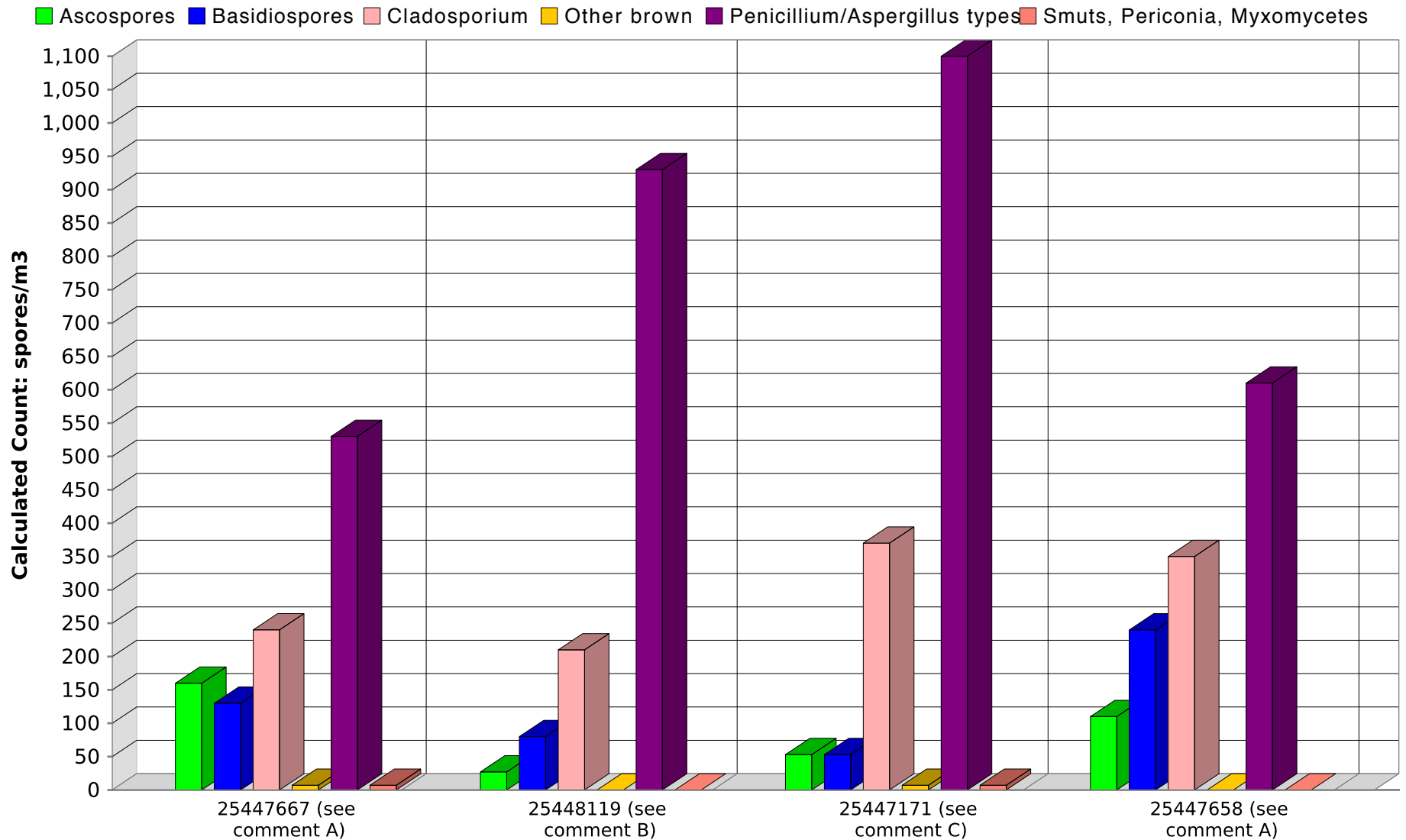
■ Alternaria ■ Ascospores ■ Basidiospores ■ Cercospora ■ Cladosporium ■ Other brown ■ Penicillium/Aspergillus types ■ Rusts
■ Smuts, Periconia, Myxomycetes



Comments: A) Secondary data review is delayed.

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

SPORE TRAP REPORT: NON-VIABLE METHODOLOGY



Comments: A) Secondary data review is delayed. B) 31 of the raw count *Penicillium/Aspergillus* type spores were present as a single clump. Secondary data review is delayed. C) 27 of the raw count *Penicillium/Aspergillus* type spores were present as a single clump. Secondary data review is delayed.

PART – III



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