August 24, 2018

Clemson University
310 Klugh Avenue
Clemson, South Carolina 29634

Attn: Mr. W. Robert Newberry, IV
E-mail: wnewber@clemson.edu

Re: Limited Mold and Allergen Investigation Report
Clemson University
Hardin Hall, Suite 126
Clemson, South Carolina
Terracon Project No. 86187072J

Dear Mr. Newberry:

Terracon Consultants, Inc. (Terracon) conducted a limited mold and allergen investigation in Suite 126 of Hardin Hall at Clemson University in Clemson, South Carolina. Reportedly, occupants have reported allergy type symptoms. This service was conducted in general accordance with our Master Service Agreement with Clemson University.

PROJECT DESCRIPTION

Scope of Services

At the request of Clemson University, Terracon conducted a limited mold and allergen investigation in Suite 126 of Hardin Hall on July 26, 2018. The occupants may also go to the basement area for storage and, therefore, was also included. Occupants have general complaints of allergy type symptoms and have also indicated construction activities are occurring adjacent to the building.

On our July 26th visit, Terracon made measurements of temperature and relative humidity and conducted airborne mold sampling which consisted of collecting spore trap air samples in seven locations inside suite and the collection of two additional samples outside for comparison. We also collected two composite microvac dust samples for mold and allergen analysis.

Standard of Care

This limited mold and allergen investigation was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession currently practicing under similar conditions in the same locale. Terracon did not attempt to identify every potential exposure or hazard present in the subject building. The results, findings, conclusions and recommendations expressed in this report are based on conditions observed during our sampling. Many factors, such as weather conditions, building occupancy, ventilation patterns and seasonal variations in fungal concentrations, can affect the conditions observed. The information contained in this report should not be relied upon to represent conditions that existed prior to or after this sampling. Terracon does not warrant the services of regulatory agencies, laboratories or other third parties supplying information that may have been used in the preparation of this report.

SAMPLING CRITERIA AND METHODS

Mold and Allergen Sampling

Total mold spore trap samples were collected using Air-O-Cell™ spore trap cassettes specifically designed for the collection of airborne mold spores. Air samples were collected using a calibrated Zefon Bio-Pump™ at a flow rate of 15 liters per minute (LPM) for 5 minutes at each location.

After collection, the spore trap samples were delivered by overnight courier to EMSL in Cinnaminson, New Jersey. EMSL is accredited by the AIHA® Laboratory Accreditation Programs, LLC under the Environmental Microbiology Laboratory Accreditation Program (EMLAP), Accreditation #100194. Air samples were analyzed by direct microscopic examination and results are reported in spores per cubic meter of air (spores/m^3).

To help interpret the mold sampling results, we compared indoor air and outdoor air measurements. High variability in airborne fungal spore concentrations can exist in different geographic locations, during different seasons, and weather patterns, and over the course of a given day. As a general rule, indoor air fungal spore concentrations in a heating, ventilation and air-conditioning (HVAC)-supplied building are typically less than, but qualitatively similar to, fungal spore concentrations found in the outside environment.

No state or federal exposure limits have been established for fungal aerosols. Regulatory standards, medically based threshold limit or dose-response relationships have not been established for exposure to airborne or surface concentrations of mold spores. Terracon relies upon experience, professional judgment, current scientific literature, guidelines and recommendations made by professional organizations and experts, and statistical methods in interpreting mold sampling results.

Two composite allergen dust samples were collected from carpeting in the suite using a high volume air sampling pump in conjunction with a 3-piece 37 millimeter dust sampling cassette preloaded with a 5.0 micrometer polyvinyl chloride (PVC) filter.

After composite dust sample collection, the allergen sample was shipped by overnight courier to EMSL in Cinnaminson, New Jersey. EMSL is accredited by the AIHA® Laboratory Accreditation Programs, LLC under the Environmental Microbiology Laboratory Accreditation Program (EMLAP), Accreditation #100194. Allergen samples were analyzed by direct microscopic examination for allergens from dust mites, mouse, rat, cat, dog, and cockroach. Allergen results are reported in micrograms per gram of dust (µg/g). Additionally the samples were analyzed for mold spores.

Temperature and Relative Humidity

Indoor air temperature and relative humidity are physical conditions important to the perception of comfort. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) has published recommendations regarding thermal comfort. ASHRAE Standard 55-2013, Thermal Environmental Conditions for Human Occupancy, identifies six primary factors that affect comfort: metabolic rate (affected by the activity being performed); clothing insulation; air temperature; radiant temperature; air speed; and humidity.

Although the relationships are complex, a temperature range between 73 and 79 degrees Fahrenheit (°F) with relative humidity between roughly 20 and 60 percent (%) are recommended for persons in a conditioned setting wearing light summer clothing. Higher temperatures require lower humidity for comfort. For persons in winter clothing, temperatures can range between 68 and 75°F, with relative humidity between 20% and 60%, with preferred conditions falling between 30% and 50% for both winter and summer temperatures. EPA recommends maintaining indoor humidity below 60%, ideally 30-50%, if possible.

Readings of temperature and relative humidity were collected with an Extech Model 445580 IAQ instrument which was calibrated by the manufacturer.

FINDINGS

General Observations

- No evidence of mold growth were observed.
- One area on interior exposed brick has indications of efflorescence in Office 126F.
- HVAC supply grilles, return grilles, and coils appeared clean.
- The rear hallway exits to an active construction area, consisting of landscaping and hardscaping with soil movement.
- Photographs from the assessment are attached.

Mold Air Sampling

On the afternoon of July 26, 2018, Terracon collected eight mold spore trap samples inside the building and two samples in outdoor locations for comparison. The results of the total spore count samples analyses are summarized in Table 1 below:

Table 1: Summary of Total Spore Count Analyses – July 26, 2018

Sample #	HH-1	HH-2	HH-3	HH-4	HH-5	HH-6	HH-7	HH-8	HH-9 & 10
Location Description	**Basement Behind Auditorium**	**Basement Hallway**	**Rear Stairwell**	**1ST Flr. Hallway**	**Suite 126**	**Office 126E**	**Office 126F**	**Office 126B**	**Outdoor Average**
Spore Type	**Spores/m³**	**Spores/m³**	**Spores/m³**	**Spores/m³**	**Spores/m³**	**Spores/m³**	**Spores/m³**	**Spores/m³**	**Spores/m³**
Alternaria (Ulocladium)									90
Ascospores		40	30		200		40	90	440-1,100
Aspergillus/ Penicillium	200	40	40		200	40	100	40	200-300
Basidiospores	40	40	880	200	660	200	620	300	8,180-15,400
Bipolaris				10					
Cladosporium			90		40		40	90	930-1,600
Curvularia			10		10		40	10	30-40
Epicoccum									10
Ganoderma			10						100-100
Myxomycetes			10	10	10		30		40-80
Pithomyces							10		10
Rust				10					
Unidentifiable Spores									30-100
Cercospora									10-40
Torula-like									10-30
Triadelphia			10						
Total	**240**	**120**	**1,080**	**230**	**1,120**	**240**	**880**	**530**	**10,150-18,720**
Temperature (degrees F.)	71	69	80	72	72	73	74	73	92
Relative Humidity (%)	54	60	49	55	55	54	53	54	36

The total mold spore levels indoors were lower than the outdoor levels. In general, the predominant mold type identified outdoors and indoors was Basidiospores. The weather on the day we sampled was very warm (92ºF) with a slight breeze. The laboratory analytical report is attached.

Temperature and Relative Humidity

The indoor temperature ranged from 69 to 80ºF and the relative humidity ranged from 49-60%. The outdoor temperature was 92ºF and the relative humidity was 36%.

Allergen Sampling

On the afternoon of July 26, 2018, Terracon collected two dust samples from the carpeting, suite at Hardin Hall. The samples were analyzed for allergens from dust mites, mouse, rat, cat, dog, and cockroach.

Allergens were identified in the samples. Table 2 below summarizes the laboratory results. The laboratory analytical report is attached and references additional information.

Table 2: Summary of Allergen Analyses – July 26, 2018

Sample #	HH-11		HH-12	
Location Description	**Composite from floor near door**		**Composite from floor near window**	
Allergen Type/Antigen	**Concentration (ug/g)**	**Laboratory assigned risk factor**	**Concentration (ug/g)**	**Laboratory assigned risk factor**
Dust Mites / Der fl	0.02	Low	ND	Low
Dust Mites / Der pl	0.02	Low	ND	Low
Mouse / Mus ml	ND	Low	ND	Low
Rat / Rat nl	ND	NA	ND	NA
Cat / Fel dl	0.93	Low	ND	Low
Dog / Can fl	1.88	Low	0.22	Low
Cockroach / Bla G2	ND	Low	ND	Low

Note: ug = microgram (10^{-6} grams), NA = Not Applicable, ND = not detected

Additionally the dust samples were analyzed for mold spores. Rare amounts a various mold spores were detected. These mold spores were also observed in the air samples. The laboratory analytical report is attached and references additional information.

CONCLUSIONS

The following conclusions are provided based on our assessment:

- Based upon visual observations, Suite 126 and the adjacent hallways overall appeared to be clean and showed no signs of moisture damage/mold growth. HVAC supply grilles, return grilles, and coils appeared clean. Office 126E did appear to be cluttered with books and other small items that appeared to be collecting dust. General increased housekeeping will reduce dust levels.
- Construction activities at the rear of Hardin Hall have a potential in increase mold spores in the soil. Limiting access into the building near the construction area should help reduce the potential for mold spores to enter the building.
- Temperature and humidity analysis showed the indoors was generally within the ASHRAE recommended ranges for summer heating and cooling cycles. These ranges can vary due to comfort levels of the individuals occupying the building.

The rear stairwell had higher than recommended temperatures; however, this could be a factor of occupants entering and leaving the building.

- Results of the spore trap sampling, showed that the indoors had mold spores at a lower concentration compared to the outdoors. Additionally the mold spores appeared to be of the same type (*Basidiospores*) in both the indoor and outdoor samples and don't indicate moisture or water damage in the interior of the space.
- Carpet vacuum samples indicated that dog and cat allergens were observed within the building, but both are reported at low levels according to the laboratory and generally are not considered an allergen concern to the general occupants. Additionally, rare levels of mold spores were detected in the carpeting.
- The interior exposed brick has indications of efflorescence in some locations. Efflorescence can occur when moisture is driven through masonry and dissolves minerals. Once the moisture reaches the other side the water evaporates and the mineral salts remain. Clemson should have Facilities observe building shell to verify excessive moisture is not infiltrating.

Terracon appreciates the opportunity to provide this service to Clemson University. If you have any questions regarding this limited mold and allergen investigation report, please contact the undersigned at 864-292-2901.

Sincerely,
Terracon Consultants, Inc.

Stephen N. Ellis
Project Industrial Hygienist

Jeffrey A. Gurrie
Senior Industrial Hygienist

Attachments: Photographs
Laboratory Results

Photographs



Photo #1 General view of the main floor hallway outside of Suite 126.

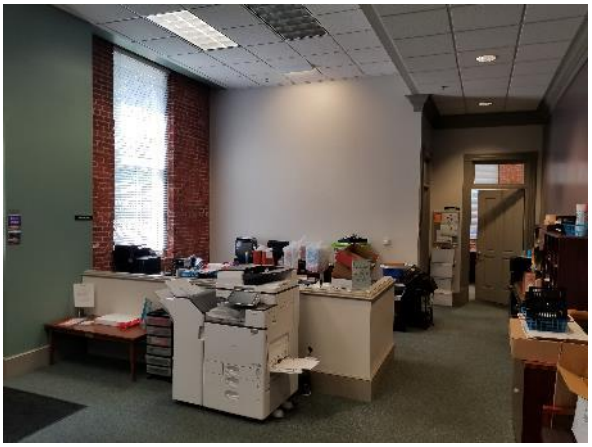


Photo #2 General view of Suite 126.



Photo #3 View of a ducted HVAC system return in Suite 126.



Photo #4 General view of office 126F in Suite 126.



Photo #5 General view of efflorescence along the top of the brick wall in office 126F.



Photo #6 General view of efflorescence on the lower portion of the exterior of Suite 126.

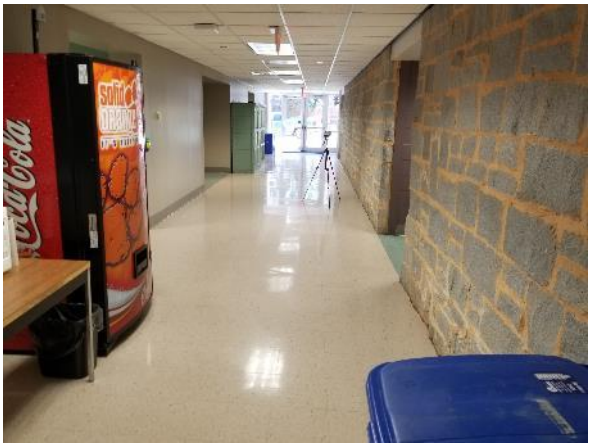


Photo #7 General view of the main basement hallway.



Photo #8 General view of the hallways adjacent to the



Photo #9 General view of the rear stairwell. (Exits into the area under construction.)



Photo #10 General view of construction work at the rear of the basement.

Laboratory Results

EMSL Analytical, Inc.
200 Route 130 North Cinnaminson, NJ 08077
Phone/Fax: (800) 220-3675 / (856) 786-0262
http://www.EMSL.com / cinnmicrolab@emsl.com

Order ID: 371812657
Customer ID: GTER78
Customer PO: 86187072J
Project ID:

Attn: Jeff Gurrie
Terracon Consultants, Inc.
72 Pointe Circle
Greenville, SC 29615

Phone: (864) 292-2901
Fax: (864) 292-6361
Collected: 07/26/2018
Received: 07/30/2018
Analyzed: 07/31/2018

Proj: 86187072J - CU Hardin Suite 126

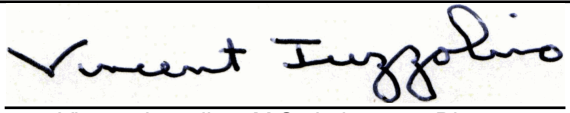
Test Report: Microscopic Examination of Fungal Spores, Fungal Structures, Hyphae, and Other Particulates from Bulk Samples (EMSL Method MICRO-SOP-200)

Lab Sample Number:	371812657-0012	371812657-0013			
Client Sample ID:	HH-11	HH-12			
Sample Location:	Direct Exam, M038, M039, M044	Direct Exam, M038, M039, M044			
Spore Types	Category	Category	-	-	-
Alternaria (Ulocladium)	Rare	-	-	-	-
Ascospores	-	-	-	-	-
Aspergillus/Penicillium	Rare	-	-	-	-
Basidiospores	Rare	-	-	-	-
Bipolaris++	-	Rare	-	-	-
Chaetomium	-	-	-	-	-
Cladosporium	-	-	-	-	-
Curvularia	Rare	Rare	-	-	-
Epicoccum	Rare	Rare	-	-	-
Fusarium	-	-	-	-	-
Ganoderma	-	-	-	-	-
Myxomycetes++	-	-	-	-	-
Pithomyces++	Rare	Rare	-	-	-
Rust	-	Rare	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-
Unidentifiable Spores	-	Rare	-	-	-
Zygomycetes	-	-	-	-	-
Hyphal Fragment	Rare	-	-	-	-
Insect Fragment	-	Rare	-	-	-
Pollen	Low	Low	-	-	-
Fibrous Particulate	Low	Low	-	-	-

Category: Count/per area analyzed - Rare: 1 to 10 Low: 11 to 100 Medium: 101 to 1000 High: >1000

- Denotes Not Detected.
Bipolaris++ = Bipolaris/Dreschlera/Exserohilum Myxomycetes++ = Myxomycetes/Periconia/Smut
* = Sample contains fruiting structures and/or hyphae associated with the spores.

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



Vincent Iuzzolino, M.S., Laboratory Director
or Other Approved Signatory

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Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Accredited #100194

Initial report from: 07/31/2018 12:20:32

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

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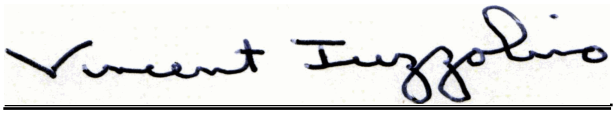
Phone: (864) 360-7572
Fax: (864) 292-6361
Collected: 07/26/2018
Received: 07/30/2018
Analyzed: 07/30/2018 - 07/31/2018

Project: 86187072J - CU Hardin Suite 126

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

Lab Sample Number:	371812657-0001			371812657-0002			371812657-0003		
Client Sample ID:	HH-1			HH-2			HH-3		
Volume (L):	75			75			75		
Sample Location	Basement Hallway Behind Auditorium			Basement Main Hallway			Rear Stairwell		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	1	40	33.3	2*	30*	2.8
Aspergillus/Penicillium	5	200	83.3	1	40	33.3	1	40	3.7
Basidiospores	1	40	16.7	1	40	33.3	20	880	81.5
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	-	-	-	2	90	8.3
Curvularia	-	-	-	-	-	-	1*	10*	0.9
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	1*	10*	0.9
Myxomycetes++	-	-	-	-	-	-	1*	10*	0.9
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Cercospora++	-	-	-	-	-	-	-	-	-
Torula-like	-	-	-	-	-	-	-	-	-
Triadelphia	-	-	-	-	-	-	1*	10*	0.9
Total Fungi	**6**	**240**	**100**	**3**	**120**	**100**	**29**	**1080**	**100**
Hyphal Fragment	-	-	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	2*	30*	-
Pollen	-	-	-	-	-	-	1*	10*	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	1	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	2	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



Vincent Iuzzolino, M.S., Laboratory Manager
or other approved signatory

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Lab 100194

Initial report from: 07/31/2018 12:20:32

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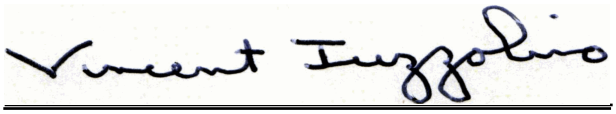
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Project: 86187072J - CU Hardin Suite 126

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

Lab Sample Number:	371812657-0004			371812657-0005			371812657-0006		
Client Sample ID:	HH-4			HH-5			HH-6		
Volume (L):	75			75			75		
Sample Location	1st Floor Main Hallway			Suite 126			Office 126E		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	-	-	-
Ascospores	-	-	-	4	200	17.9	-	-	-
Aspergillus/Penicillium	-	-	-	4	200	17.9	1	40	16.7
Basidiospores	4	200	87	15	660	58.9	5	200	83.3
Bipolaris++	1*	10*	4.3	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	-	-	-	1	40	3.6	-	-	-
Curvularia	-	-	-	1*	10*	0.9	-	-	-
Epicoccum	-	-	-	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	-	-	-
Myxomycetes++	1*	10*	4.3	1*	10*	0.9	-	-	-
Pithomyces++	-	-	-	-	-	-	-	-	-
Rust	1*	10*	4.3	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	-	-	-
Zygomycetes	-	-	-	-	-	-	-	-	-
Cercospora++	-	-	-	-	-	-	-	-	-
Torula-like	-	-	-	-	-	-	-	-	-
Triadelphia	-	-	-	-	-	-	-	-	-
Total Fungi	**7**	**230**	**100**	**26**	**1120**	**100**	**6**	**240**	**100**
Hyphal Fragment	-	-	-	1	40	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	2	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	1	-	-	1	-	-	1	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



Vincent Iuzzolino, M.S., Laboratory Manager
or other approved signatory

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

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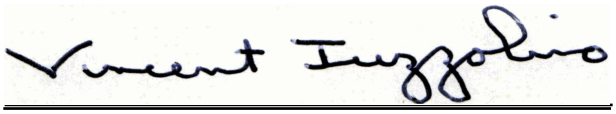
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Received: 07/30/2018
Analyzed: 07/30/2018 - 07/31/2018

Project: 86187072J - CU Hardin Suite 126

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

Lab Sample Number:	371812657-0007			371812657-0008			371812657-0009		
Client Sample ID:	HH-7			HH-8			HH-9		
Volume (L):	75			75			75		
Sample Location	Office 126F			Office 126B			Outdoors 1		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-	2	90	0.5
Ascospores	1	40	4.5	2	90	17	26	1100	5.9
Aspergillus/Penicillium	3	100	11.4	1	40	7.5	4	200	1.1
Basidiospores	14	620	70.5	7	300	56.6	349	15400	82.3
Bipolaris++	-	-	-	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-	-	-	-
Cladosporium	1	40	4.5	2	90	17	37	1600	8.5
Curvularia	1	40	4.5	1*	10*	1.9	1	40	0.2
Epicoccum	-	-	-	-	-	-	1*	10*	0.1
Fusarium	-	-	-	-	-	-	-	-	-
Ganoderma	-	-	-	-	-	-	3	100	0.5
Myxomycetes++	2*	30*	3.4	-	-	-	1	40	0.2
Pithomyces++	1*	10*	1.1	-	-	-	-	-	-
Rust	-	-	-	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-	-	-	-
Unidentifiable Spores	-	-	-	-	-	-	3	100	0.5
Zygomycetes	-	-	-	-	-	-	-	-	-
Cercospora++	-	-	-	-	-	-	1*	10*	0.1
Torula-like	-	-	-	-	-	-	2*	30*	0.2
Triadelphia	-	-	-	-	-	-	-	-	-
Total Fungi	**23**	**880**	**100**	**13**	**530**	**100**	**430**	**18720**	**100**
Hyphal Fragment	2*	30*	-	-	-	-	-	-	-
Insect Fragment	-	-	-	-	-	-	-	-	-
Pollen	-	-	-	2*	30*	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	44	-	-	44	-
Analyt. Sensitivity 300x	-	13*	-	-	13*	-	-	13*	-
Skin Fragments (1-4)	-	2	-	-	2	-	-	1	-
Fibrous Particulate (1-4)	-	1	-	-	1	-	-	1	-
Background (1-5)	-	2	-	-	2	-	-	1	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



Vincent Iuzzolino, M.S., Laboratory Manager
or other approved signatory

High levels of background particulate can obscure spores and other particulates leading to underestimation. Background levels of 5 indicate an overloading of background particulates, prohibiting accurate detection and quantification. Present = Spores detected on overloaded samples. Results are not blank corrected unless otherwise noted. The detection limit is equal to one fungal spore, structure, pollen, fiber particle or insect fragment. "*" Denotes particles found at 300X. "-" Denotes not detected. Due to method stopping rules, raw counts in excess of 100 are extrapolated based on the percentage analyzed. EMSL maintains liability limited to cost of analysis. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. Interpretation and use of test results are the responsibility of the client. Samples received in good condition unless otherwise noted.

Samples analyzed by EMSL Analytical, Inc. Cinnaminson, NJ AIHA-LAP, LLC--EMLAP Lab 100194

Initial report from: 07/31/2018 12:20:32

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

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EMSL Order: 371812657
Customer ID: GTER78
Customer PO: 86187072J
Project ID:

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Terracon Consultants, Inc.
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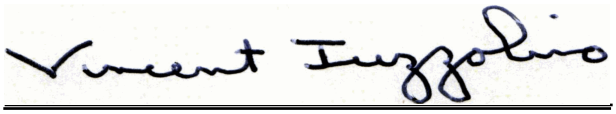
Phone: (864) 360-7572
Fax: (864) 292-6361
Collected: 07/26/2018
Received: 07/30/2018
Analyzed: 07/30/2018 - 07/31/2018

Project: 86187072J - CU Hardin Suite 126

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

Lab Sample Number:	371812657-0010			371812657-0011		
Client Sample ID:	HH-10			HH-BL		
Volume (L):	75					
Sample Location	Outdoors 2			Blank		
Spore Types	**Raw Count**	**Count/m³**	**% of Total**	**Raw Count**	**Count/m³**	**% of Total**
Alternaria (Ulocladium)	-	-	-	-	-	-
Ascospores	10	440	4.3	-	-	-
Aspergillus/Penicillium	7	300	3	-	-	-
Basidiospores	185	8180	80.6	-	-	-
Bipolaris++	-	-	-	-	-	-
Chaetomium	-	-	-	-	-	-
Cladosporium	21	930	9.2	-	-	-
Curvularia	2*	30*	0.3	-	-	-
Epicoccum	-	-	-	-	-	-
Fusarium	-	-	-	-	-	-
Ganoderma	3	100	1	-	-	-
Myxomycetes++	6*	80*	0.8	-	-	-
Pithomyces++	1*	10*	0.1	-	-	-
Rust	-	-	-	-	-	-
Scopulariopsis/Microascus	-	-	-	-	-	-
Stachybotrys/Memnoniella	-	-	-	-	-	-
Unidentifiable Spores	2*	30*	0.3	-	-	-
Zygomycetes	-	-	-	-	-	-
Cercospora++	1	40	0.4	-	-	-
Torula-like	1*	10*	0.1	-	-	-
Triadelphia	-	-	-	-	-	-
Total Fungi	**239**	**10150**	**100**	**-**	**No Trace**	**-**
Hyphal Fragment	-	-	-	-	-	-
Insect Fragment	1	40	-	-	-	-
Pollen	-	-	-	-	-	-
Analyt. Sensitivity 600x	-	44	-	-	0	-
Analyt. Sensitivity 300x	-	13*	-	-	0*	-
Skin Fragments (1-4)	-	1	-	-	-	-
Fibrous Particulate (1-4)	-	1	-	-	-	-
Background (1-5)	-	1	-	-	-	-

Bipolaris++ = Bipolaris/Drechslera/Exserohilum
Myxomycetes++ = Myxomycetes/Periconia/Smut



Vincent Iuzzolino, M.S., Laboratory Manager
or other approved signatory

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Initial report from: 07/31/2018 12:20:32

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EMSL Order #:	**371812657**
Customer ID:	**GTER78**
Customer PO:	**86187072J**

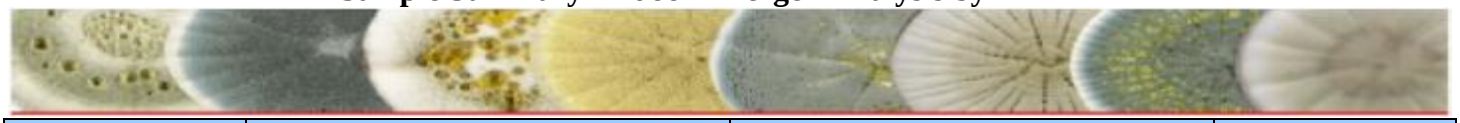
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Project: **86187072J - CU Hardin Suite 126**

Date Collected: **7/26/2018**
Date Received: **7/30/2018**
Date Analyzed: **8/2/2018**

Sample Summary -Indoor Allergen Analysis by MARIA®



Lab Sample Number	Client Sample ID	Sample Location	Sample Type
371812657-0012	HH-11	Direct Exam, M038, M039, M044	Bulk
371812657-0013	HH-12	Direct Exam, M038, M039, M044	Bulk

Report Date	Report Revision	Revision Comments
8/6/2018	R0	Initial Report

Vincent Iuzzolino, M.S., Laboratory Director
or approved EMSL Analytical, Inc. signatory

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Project: **86187072J - CU Hardin Suite 126**

Date Collected: **7/26/2018**
Date Received: **7/30/2018**
Date Analyzed: **8/2/2018**

EMSL Sample #: **371812657-0012**
Client ID: **HH-11**
Location: **Direct Exam, M038, M039, M044**

Sample Type: **Bulk**
Sample Size: **30**
Sample Units: **mg**

Analytical Results -Indoor Allergen Analysis by MARIA®

Test Parameter	*Antigens*	*Detection Limits*		*Concentrations*		*Allergen Risk Levels*
Dust Mites Allergen	Der f1	0.012	µg/g	**0.02**	µg/g	☑
Dust Mites Allergen	Der p1	0.012	µg/g	**0.02**	µg/g	☑
Mouse Allergen	Mus m1	0.002	µg/g	**ND**	µg/g	☑
Rat Allergen	Rat n1	0.004	µg/g	**ND**	µg/g	†
Cat Allergen	Fel d1	0.004	µg/g	**0.93**	µg/g	☑
Dog Allergen	Can f1	0.012	µg/g	**1.88**	µg/g	☑
Cockroach Allergen	Bla g2	0.012	µg/g	**ND**	µg/g	☑

†Sufficient evidence is not available for risk levels.

Allergen Risk Levels:

High -Risk of acute asthmatic attack.

Moderate -Risk for sensitization and bronchial hyperactivity.

Low -Not sufficient to cause symptoms or ND (None Detected); Indicates that the amount of allergen in the sample is below the detection limits.

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Report Date	Report Revision	Revision Comments
8/6/2018	R0	Initial Report

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Project: **86187072J - CU Hardin Suite 126**

Date Collected: **7/26/2018**
Date Received: **7/30/2018**
Date Analyzed: **8/2/2018**

EMSL Sample #: **371812657-0013**
Client ID: **HH-12**
Location: **Direct Exam, M038, M039, M044**

Sample Type: **Bulk**
Sample Size: **1 Filter**
Sample Units: **Filter**

Analytical Results -Indoor Allergen Analysis by MARIA®

Test Parameter	*Antigens*	*Detection Limits*		*Concentrations*		*Allergen Risk Levels*
Dust Mites Allergen	Der f1	0.03	ng/filter	**ND**	ng/filter	†
Dust Mites Allergen	Der p1	0.03	ng/filter	**ND**	ng/filter	†
Mouse Allergen	Mus m1	0.005	ng/filter	**ND**	ng/filter	†
Rat Allergen	Rat n1	0.01	ng/filter	**ND**	ng/filter	†
Cat Allergen	Fel d1	0.01	ng/filter	**ND**	ng/filter	†
Dog Allergen	Can f1	0.03	ng/filter	**0.22**	ng/filter	†
Cockroach Allergen	Bla g2	0.03	ng/filter	**ND**	ng/filter	†

†Sufficient evidence is not available for risk levels.

Allergen Risk Levels:

High -Risk of acute asthmatic attack.

Moderate -Risk for sensitization and bronchial hyperactivity.

Low -Not sufficient to cause symptoms or ND (None Detected); Indicates that the amount of allergen in the sample is below the detection limits.

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8/6/2018	R0	Initial Report

Vincent Iuzzolino, M.S., Laboratory Director
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Project: **86187072J - CU Hardin Suite 126**

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Date Analyzed: **8/2/2018**



Guidelines to Interpretation

µg/g

Allergens	<DL	<1	1	2	3	4	5	6	7	8	9	>10
Fel d1	ND	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High	High	High
Can f1	ND	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High
Der p1	ND	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High
Der f1	ND	Low	Low	Mod	Mod	Mod	Mod	Mod	Mod	Mod	Mod	High
Mus m1	ND	Low	Mod	Mod	Mod	High	High	High	High	High	High	High

µg/m3

Rat n1	ND	<0.7 µg /m3 = Not associated with increased risk of asthma

µg/g

	<DL	<0.08	0.08	0.09	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8
Bla g2 †	ND	Low	Mod	Mod	Mod	Mod	Mod	Mod	High	High	High	High

† *Suggested levels. Not officially established.*

Note: *This report and guidelines furnish information only. Whether an individual suffers allergic symptoms or not depends on his/her medical history and previous exposure.*

References

Journal of Allergy and Clinical Immunology 1989; 83:416-427
Journal of Allergy and Clinical Immunology 1995; 96:449-456
The American review of respiratory disease 1990; 141:361-367
The American review of respiratory disease 1993; 147:573-578
Environmental Health Perspectives 2002; 110:419-425
Clinical and Experimental Allergy 1998; 28(5):537-44
Pediatric allergy-principles and practice. Mosby Inc 2003: 261-268.

Terminology

ELISA	Enzyme-linked Immunosorbent Assay
MARIA®	Multiplex Array for Indoor Allergens
Allergen	A substance which reacts with the body's immune system to produce an allergic reaction.
Antigen	A substance, foreign to the body, which stimulates the production of antibodies by the immune system.
Bla g2	*Blattella germanica* (Cockroach) allergen 2
Can f1	*Canis familiaris* (Dog) allergen 1
Der f1	*Dermatophagoides farinae* (Dust Mites) allergen 1
Der p1	*Dermatophagoides pteronyssinus* (Dust Mites) allergen 1
Detection Limits	DL is the smallest amount of a substance, in this case antigens, which can be measured.
Fel d1	*Felis domesticus* (Cat) allergen 1
Mus m1	*Mus musculus* (Mouse) allergen 1
ND	None detected, if any allergens are present they are below the detection limits.
Rat n1	*Rattus norvegicus* (Rat) allergen 1

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Project: **86187072J - CU Hardin Suite 126**

Date Collected: **7/26/2018**
Date Received: **7/30/2018**
Date Analyzed: **8/2/2018**

Important Terms, Conditions, and Limitations

A. Sample Retention
Samples analyzed by EMSL will be retained for 60 days after analysis date. Storage beyond this period is available for a fee with written request prior to the initial 30 day period. Samples containing hazardous/toxic substances which require special handling will be returned to the client immediately. EMSL reserves the right to charge a sample disposal fee or return samples to the client.

B. Change Orders and Cancellation
All changes in the scope of work or turnaround time requested by the client after sample acceptance must be made in writing and confirmed in writing by EMSL. If requested changes result in a change in cost the client must accept payment responsibility. In the event work is cancelled by a client, EMSL will complete work in progress and invoice for work completed to the point of cancellation notice. EMSL is not responsible for holding times that are exceeded due to such changes.

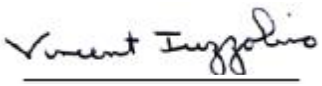
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D. Limits of Liability
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E. Indemnification
Client shall indemnify EMSL and its officers, directors and employees and hold each of them harmless for any liability, expense or cost, including reasonable attorney's fees, incurred by reason of any third party claim in connection with EMSL's services, the test result data or its use by client.

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Report Date	Report Revision	Revision Comments
8/6/2018	R0	Initial Report



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EMSL Order Number *(Lab Use Only)*: 371812657

Company : Terracon Consultans, Inc.		**EMSL-Bill to:** ✓ Same ☐ Different If Bill to is Different note instructions in Comments** Third Party Billing requires written authorization from third party	
Street: 72 Pointe Circle			
City: Greenville	**State/Province:** SC	**Zip/Postal Code:** 29615	**Country:** US
Report To (Name): Jeff Gurrie		**Telephone #:** 864.292.2901	
Email Address: jeff.gurrie@terracon.com		**Fax #:** 864.292.6361	**Purchase Order:**
Project Name/Number: 86187072J - CU Hardin Suite 126		**Please Provide Results:** ☐ FAX ✓ E-mail ☐ Mail	
U.S. State Samples Taken: SC		**Connecticut Samples:** Commercial Residential	

Turnaround Time (TAT) Options* - Please Check

☐ 3 Hour ☐ 6 Hour ■ 24 Hour ☐ 48 Hour ☐ 72 Hour ☐ 96 Hour ■ 1 Week ☐ 2 Week

**For RUSH TAT's Please Call Ahead to Confirm Lab Hours and Availability. Not all TAT options are valid for every test. Materials Science and IAQ TATs are in Business Days rather than Hours (i.e. 24 Hour = End of Next Business Day)*

Asbestos

PCM - Air
☐ NIOSH 7400
☐ w/ 8hr. TWA

TEM– Air ☐ 4-4.5hr TAT(AHERA ONLY)
☐ AHERA 40 CFR, Part 763
☐ NIOSH 7402
☐ EPA Level II
☐ ISO 10312

TEM - Water
Fibers ≥10µm ☐ Waste ☐ Drinking
All Fiber Sizes ☐ Waste ☐ Drinking

PLM - Bulk
☐ PLM EPA 600/R-93/116
☐ PLM EPA NOB (<1%)
☐ NYS 198.1 (friable-NY)
☐ NYS 198.6 (non-friable-NY)
Point Count ☐ 400 (<0.25%) ☐ 1000 (<0.1%)
Point Count w/ Gravimetric ☐ 400 (<0.25%) ☐ 1000 (<0.1%)

TEM - Dust
☐ Microvac – ASTM D 5755
☐ Wipe-ASTM D6480

TEM - Bulk
☐ TEM EPA NOB
☐ NYS NOB 198.4 (non-friable-NY)
☐ Chatfield SOP

Soil/Rock/Vermiculite
☐ PLM CARB 435 – A (0.25% sensitivity)
☐ PLM CARB 435 – B (0.1% sensitivity)
☐ TEM CARB 435 – B (0.1% sensitivity)
☐ EPA Reg. 1 Screening Protocol (Qualitative)

Other:

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Lead (Pb)

Flame Atomic Absorption
☐ Chips SW846-7000B or AOAC 974.02
☐ Soil SW846-7000B/7420
☐ Air NIOSH 7082
☐ Wastewater SM3111B or SW846-7000B/7420
☐ ASTM Wipe SW846-7000B/7420
☐ non ASTM Wipe SW846-7000B/7420
☐ TCLP SW846-1311/7420/SM 3111B

ICP
☐ Air NIOSH 7300 Modified
☐ non ASTM Wipe SW846-6010B or C
☐ ASTM Wipe SW846-6010B or C
☐ Soil SW846-6010 B or C
☐ Waste Water SW846-6010B or C
☐ TCLP SW846-6010B or C

Graphite Furnace Atomic Absorption
☐ Soil SW846-7421 ☐ Wastewater EPA 200.9
☐ Air NIOSH 7105 ☐ Drinking Water EPA 200.9

Other: ☐

Materials Science

☐ Common Particle ID (large particles)
☐ Full Particle ID (environmental dust)
☐ Basic Material ID (solids)
☐ Advanced Material ID
☐ Physical Testing (Tensile, Compression)
☐ Combustion-by-products (soot, char, etc.)
☐ X-Ray Fluorescence (elem. analysis)
☐ X-Ray Diffraction (Crystalline Part.)
☐ MMVF's (Fibrous glass, RCF's)
☐ Particle Size (sieve/microscopy/laser)
☐ Combustible Dust
☐ Petrographic Examination
Other: ☐

Microbiology

Wipe and Bulk Samples
■ Mold & Fungi – Direct Examination
☐ Mold & Fungi Culture (Genus Only)
☐ Mold & Fungi Culture (Genus & Species)
☐ Bacterial Count & ID (Up to Three Types)
☐ Bacterial Count & ID (Up to Five Types)
☐ MRSA
☐ *Pseudomonas aeruginosa*

Water Samples
☐ Total Coliform & E.coli (P/A)
☐ Fecal Coliform (SM 9222D)
☐ Sewage Screen
☐ Heterotrophic Plate Count (SM 9215)

Air Samples
■ Mold & Fungi (Spore Trap)
☐ Mold & Fungi Culture (Genus Only)
☐ Mold & Fungi (Genus & Species)
☐ Bacterial Culture & ID (Up to Three Types)
☐ Bacterial Culture & ID (Up to Five Types)
☐ Endotoxin Testing

Real Time Q-PCR (See Analytical Guide for Code)
Code:

Legionella
☐ Level 1 ☐ Level 2 ☐ Level 3 ☐ Level 4

Other: ☐

IAQ

Nuisance Dust NIOSH ☐ 0500 ☐ 0600
Airborne Dust ☐ PM10 ☐ TSP
Silica Analysis: ☐ All Species
Silica Analysis – Single Species
☐ Alpha Quartz ☐ Cristobalite ☐ *Tridymite*
☐ HVAC Efficiency
☐ Carbon Black
☐ Airborne Oil Mist
Radon Testing: Call for Kit and COC
Other: ■

****Comments/Special Instructions:** CC - Stephen.Ellis@terracon.com

Client Sample #'s			**Total # of Samples:** 13
Relinquished (Client):		**Date:** 7-27-18	**Time:** 1725
Received (Lab):		**Date:** 7/30/18	**Time:** 9:40

Analysis Completed in Accordance with EMSL's Terms and Conditions located in the Analytical Price Guide

OrderID: 371812657

EMSL ANALYTICAL, INC.
LABORATORY • PRODUCTS • TRAINING

Chain of Custody

EMSL Order Number (*Lab Use Only*):

371812657

EMSL Analytical, Inc.
200 Route 130 North

Cinnaminson, NJ 08077
PHONE: 1-800-220-3675
FAX: (856) 786-5974

Sample #	Sample Description	Volume/Area (Air) HA # (Bulk)	Date/Time Sampled
HH-1	Basement Hallway behind Auditorium	75L	7-26-18
HH-2	Basement Main Hallway	75L	"
HH-3	Rear Stairwell	75L	"
HH-4	1st Floor Main Hallway	75L	"
HH-5	Suite 126	75L	"
HH-6	Office 126 E	75L	"
HH-7	Office 126 F	75L	"
HH-8	Office 126 B	75L	"
HH-9	Outdoors 1	75L	"
HH-10	Outdoors 2	75L	"
HH-BL	Blank	0L	"
HH-11	Direct Exam, ~~M038, M039~~, M044	N/A	"
HH-12	Direct Exam, ~~M038, M039,~~ M044	N/A	"
	M254 7.30.18 VLG Group rat & mouse		

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CINNAMINSON, N.J.
2018 JUL 30 A 10:04

***Comments/Special Instructions:**

CC - Stephen.Ellis@terracon.com

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