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August 3, 2022

Mr. Michael Lane
Environmental, Health & Safety Manager
Office of Court Management/ Facilities Management & Capital Planning Lowell District Court
41 Hurd Street
Lowell, MA 01852

Ref: Indoor Air Quality & Microbial Assessment – Visit 3
Springfield Court Complex
Roderick L. Ireland Courthouse, 50 State Street, Springfield, MA &
Springfield Housing & Juvenile Courthouse, 80 State Street, Springfield, MA
TRC Project 499949

Dear Mr. Lane:

On July 21, 2022, TRC Environmental Corporation (TRC) conducted a limited indoor air quality and microbial assessment at the above-referenced sites. TRC conducted the following scope of work:

- Visual inspection of up to sixty (60) locations between the two buildings;
- Direct-reading measurements of selected indoor air quality parameters including temperature, relative humidity, carbon monoxide (CO), and carbon dioxide (CO_2); airborne particulate as PM_{10} (particles with aerodynamic diameters of approximately 10 microns or less), total volatile organic compounds (VOC's) and
- Sampling for airborne concentrations of total fungal (mold)[1] spores in eighteen (18) indoor locations.

The site observations, test methods used, results and conclusions, and recommendations are presented below. A copy of the laboratory analytical report and the sample location drawings are included as attachments to this report.

INVESTIGATIVE STRATEGY

Visual Inspection

The readily accessible areas of the above referenced property were visually evaluated for evidence of water staining, water damage, and suspect fungal growth (mold). A reasonable effort was made to identify fungal-impacted building materials.

Carbon Dioxide, Carbon Monoxide, Temperature and Relative Humidity

TRC used a TSI® 7575X Q-Trak to monitor relative humidity, temperature, carbon monoxide (CO), and carbon dioxide (CO_2) levels.

[1] For the purposes of this report, the terms "mold" and "fungi" may be used interchangeably

- *Carbon Dioxide* - Carbon dioxide is exhaled by people and is a useful indicator of adequate make-up (fresh) air and supply per occupant. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) Standard 62.1-2019, *Ventilation for Acceptable Indoor Air Quality*, recommends the difference between indoor and outdoor CO_2 concentrations be maintained at 700 parts per million (ppm) or less. Maintaining this condition equates to approximately 15 cubic feet per minute of supply air per occupant. Under this condition, a substantial majority of visitors entering a space will be satisfied with respect to human bioeffluents (body odor). The Massachusetts Department of Public Health (MA DPH) uses a guideline of 800 ppm of CO_2 for publicly occupied buildings[2]. Note that while indoor CO_2 levels are useful for evaluating the outdoor air ventilation provided to a building, these levels are typically well below concentrations that might pose a CO_2-related health risk (greater than 5,000 ppm). Ambient concentrations of CO_2 generally range from 300 - 500 ppm.

- *Carbon Monoxide* - Carbon monoxide is a colorless, odorless gas that can cause fatigue or drowsiness, nausea, headache, and difficulty breathing when present at elevated levels. ASHRAE Standard 62.1-2019 recommends carbon monoxide concentrations less than 9 ppm indoors as an eight-hour average.

- *Temperature and Relative Humidity* - ASHRAE Standard 55-2020, *Thermal Environmental Conditions for Human Occupancy* bases occupant thermal comfort on a combination of metabolic rate, clothing insulation, air temperature (dry bulb temperature as a substitute for operative temperature), radiant temperature, air speed, and humidity. Conditions are considered to be satisfactory when a substantial majority of occupants (80% or more) are not expressing dissatisfaction with thermal comfort.

  ASHRAE standard 62.1-2019 *Ventilation for Acceptable Indoor Air Quality* recommends that the relative humidity be maintained below 65%.

Measurement of Airborne Particulate Matter

A TSI® DustTrak DRX Aerosol Monitor was used to monitor airborne particulate matter of approximately 10 micrometers or less in diameter (PM_{10}).

Airborne particulate in indoor environments originates from various sources including building materials and furnishings, occupant activities, cleaning, construction, and renovation activities, and from outdoors. High concentrations of airborne dust may cause irritation of the eyes, skin, and respiratory tract.

The U.S. EPA has established a health-based National Ambient Air Quality Standard (NAAQS) for PM_{10} to evaluate outdoor air quality. This is not intended to evaluate worker exposure but are meant to protect the health of sensitive individuals within the general population. The NAAQS is based on rolling-24-hour average concentrations over a 3-day period and as such, is not directly comparable to individual PM measurements taken during this assessment; however, the NAAQS

[2] MA DPH "Carbon Dioxide and Its Use in Evaluating Adequacy of Ventilation in Buildings", www.mass.gov/eohhs/docs/dph/environmental/iaq/appendices/carbon-dioxide.pdf

is provided in this report as a benchmark. The NAAQS for PM_{10} is 0.150 milligrams per cubic meter of air (mg/m^3) measured as a 24-hour average concentration.

The OSHA Permissible Exposure Limit (PEL) for occupational exposure for total dust is 15 mg/m^3- and for the respirable dust fraction is 5 mg/m^3, both as 8-hour average concentrations.

The instrument is calibrated approximately annually by the manufacturer and is zeroed prior to use in the field.

Measurement of Total Volatile Organic Compounds (VOCs)

A ppbRAE Model PGM-7240, ppbRAE 3000 photo-ionizing detector (PID) (or similar instrument) was used to monitor VOCs. VOC measurements were performed to determine if unusually elevated concentrations of this group of air contaminants existed at the monitored locations. VOCs have many sources, including, but not limited to the evaporation of paint solvents; adhesives; and office or personal products that are used in the building, such as cosmetic fragrances, air fresheners and deodorizing and sanitizing products.

Although the instrument used in this study is a useful screening method for detecting indoor VOCs, it provides no information on the identities and relative amounts of individual compounds that may be present. If indoor VOC concentrations are significantly and consistently greater than the outdoor VOC concentration, then one or more indoor VOC sources may be present.

The U.S. Green Building Council Leadership in Energy and Environmental Design (USGBC LEED) for New Construction-2009 requirements specify a maximum VOC concentration of 0.500 milligrams per cubic meter of air (mg/m^3) in newly constructed areas and is used in this report as a guideline for evaluating indoor air quality. Assuming an average VOC molecular weight similar to that of n-hexane, this corresponds to approximately 0.140 ppm VOCs.

The instrument was calibrated prior to use in the field using standard isobutylene calibration gas.

Microbial Sampling – Air Samples

Sampling for airborne concentrations of total fungal spores was conducted using Allergenco-D sampling cassettes. Samples were collected at 15 liters of air per minute for five-minute sampling periods using a high-volume sampling pump. Airborne particulates were drawn through the cassette and directly impacted onto an adhesive collection media. The samples were shipped to Hayes Microbial Consulting of Midlothian, Virginia where they were analyzed to determine the quantity and identity of fungal spore types using bright field microscopy (magnification 300x and 600x). Hayes Microbial participates in the American Industrial Hygiene Association (AIHA) Environmental Microbiology Laboratory Accreditation Program (EMLAP), certification #188863. The Allergenco-D cassette collects both viable and non-viable fungal spores, and the laboratory can identify some of the collected spores down to the genus level.

TRC collected representative air samples in selected indoor locations and also outdoors, for comparison purposes.

There is currently little information available on total airborne fungal spore dose-response relationships, and there are no recommended allowable exposure limits established for airborne spores. The American Conference of Governmental Industrial Hygienists (ACGIH) publication *Bioaerosols: Assessment and Control*, indicates that an exposure may be considered unusual when indoor concentrations are significantly higher than those outdoors, or when the types of mold detected indoors vs. outdoors differ markedly.

RESULTS

Visual Inspection

On the day of this assessment, no suspect fungal growth was observed in any of the areas inspected. Horizontal surfaces appeared to be clean of any dust or debris.

Indoor Air Quality Measurements

Results of the indoor air quality measurements are presented in the table below. The results are presented in the following units: temperature measurements are presented in degrees Fahrenheit (ºF); relative humidity measurements are presented as percent relative humidity (%); the CO_2, CO and VOC measurements are presented in concentration units of parts per million parts of air, by volume (ppm); and PM_{10} measurements are presented in concentration units of milligrams per cubic meter of air (mg/m^3).

Indoor Air Quality Measurements
Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts
July 21, 2022

Test #	Location	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
Springfield Housing & Juvenile Courthouse, 80 State Street, Springfield, MA							
001	Outdoor – North Entrance	80.4	75.6	425	ND (<3)	0.029	ND (<0.020)
002	107 – Vestibule	74.3	42.4	569	ND (<3)	0.010	ND (<0.020)
003	101 – Office	73.3	42.8	608	ND (<3)	0.005	ND (<0.020)
004	116 – Housing Clerks Office	72.2	42.3	603	ND (<3)	0.006	ND (<0.020)
005	144 – Office	72.0	49.0	577	ND (<3)	0.004	ND (<0.020)

Indoor Air Quality Measurements Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts July 21, 2022							
Test #	**Location**	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
006	125 – Vestibule	72.6	53.4	578	ND (<3)	0.006	ND (<0.020)
007	152 – Juvenile Courtroom #3	70.1	53.1	588	ND (<3)	0.014	ND (<0.020)
008	151C – Attorneys Room	72.5	63.0	673	ND (<3)	0.012	ND (<0.020)
009	B48 – Elevator Lobby	74.0	60.2	511	ND (<3)	0.013	ND (<0.020)
010	B55 – Electrical Room	74.7	58.5	540	ND (<3)	0.013	ND (<0.020)
011	B22 – Kitchenette	73.8	56.5	513	ND (<3)	0.010	ND (<0.020)
012	B30 – Conference Room	73.4	56.1	506	ND (<3)	0.009	ND (<0.020)
013	B37 – Office	73.1	60.2	562	ND (<3)	0.011	0.126
014	B28 – Office	71.7	53.3	533	ND (<3)	0.011	ND (<0.020)
015	B12 – Waiting Area	72.0	63.3	526	ND (<3)	0.001	ND (<0.020)
016	328 – Reception	72.9	61.1	540	ND (<3)	0.013	ND (<0.020)
017	338 – Juvenile/Probation Clerical	72.4	55.6	635	ND (<3)	0.012	ND (<0.020)
018	347 – Office	72.4	61.2	566	ND (<3)	0.012	ND (<0.020)

Indoor Air Quality Measurements Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts July 21, 2022							
Test #	**Location**	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
019	331 – Employee Lounge	73.4	61.2	573	ND (<3)	0.012	ND (<0.020)
020	Outside Judges Lobby 232	73.6	62.0	561	ND (<3)	0.013	ND (<0.020)
021	236 – Outside Judges Lobby 223	74.2	61.3	576	ND (<3)	0.014	ND (<0.020)
022	245 – Office	73.4	56.0	577	ND (<3)	0.013	ND (<0.020)
023	316 – File Room	71.1	56.5	474	ND (<3)	0.002	ND (<0.020)
024	322 – Office	71.2	58.0	481	ND (<3)	0.002	ND (<0.020)
025	301 – Conference Room	71.7	61.3	492	ND (<3)	0.004	**0.370**
026	215 – Conference Room B	71.9	**65.1**	501	ND (<3)	0.004	ND (<0.020)
027	206 – Vestibule	73.0	**73.6**	457	ND (<3)	0.007	ND (<0.020)
028	221 – Security	73.8	**65.3**	499	ND (<3)	0.003	ND (<0.020)
029	229 – Waiting Area	73.6	54.8	707	ND (<3)	0.005	ND (<0.020)

Indoor Air Quality Measurements Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts July 21, 2022							
Test #	**Location**	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
Roderick L. Ireland Courthouse, 50 State Street, Springfield, MA							
030	Outdoor – East Courtyard	89.3	61.4	405	ND (<3)	0.011	ND (<0.020)
031	427 – Employee Lounge	74.3	51.3	718	ND (<3)	0.020	ND (<0.020)
032	Probate Courtroom #4 – Conference Room B	73.2	63.0	888	ND (<3)	0.013	ND (<0.020)
033	441 – Office	72.0	62.1	744	ND (<3)	0.018	ND (<0.020)
034	416 – Office	71.3	63.1	702	ND (<3)	0.017	ND (<0.020)
035	407 – Registry of Deeds Office	70.4	64.1	666	ND (<3)	0.016	ND (<0.020)
036	414 – Conference Room	71.7	61.1	678	ND (<3)	0.019	ND (<0.020)
037	334 – Attorneys Lounge Office	70.0	**76.8**	597	ND (<3)	0.015	ND (<0.020)
038	Law Library – Northeast Corner	73.4	63.0	578	ND (<3)	0.017	ND (<0.020)
039	Superior Courtroom #3	70.4	**80.2**	551	ND (<3)	0.014	0.097
040	336 – Storage Room	71.8	**75.8**	652	ND (<3)	0.016	ND (<0.020)
041	385 – DA Reception Desk	71.8	**76.8**	611	ND (<3)	0.017	ND (<0.020)
042	374 – Jury Room	73.6	**77.2**	610	ND (<3)	0.016	ND (<0.020)

Indoor Air Quality Measurements Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts July 21, 2022							
Test #	**Location**	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
043	205 – Deliberation Room	73.3	**77.4**	606	ND (<3)	0.018	ND (<0.020)
044	District Courtroom #5	71.8	**75.6**	531	ND (<3)	0.016	ND (<0.020)
045	211 – Office	71.8	**74.4**	632	ND (<3)	0.017	ND (<0.020)
046	230 – Lockup	74.4	**67.0**	606	ND (<3)	0.018	ND (<0.020)
047	Superior Courtroom #8	72.5	**70.9**	548	ND (<3)	0.017	ND (<0.020)
048	247 – Jury Room	72.9	**73.7**	550	ND (<3)	0.018	ND (<0.020)
049	124 – Lockup	72.7	63.7	575	ND (<3)	0.016	ND (<0.020)
050	121B – Judges Lobby	72.3	**68.8**	598	ND (<3)	0.017	ND (<0.020)
051	133 – Office	71.1	**72.5**	546	ND (<3)	0.017	ND (<0.020)
052	109 – Mail/Copy Room	69.8	**65.8**	659	ND (<3)	0.017	ND (<0.020)
053	142 – Office	69.6	**68.0**	576	ND (<3)	0.018	ND (<0.020)
054	154 – Office	71.1	**68.2**	604	ND (<3)	0.016	**0.237**
055	G01 - Office	70.6	**72.1**	569	ND (<3)	0.015	ND (<0.020)

Indoor Air Quality Measurements
Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts
July 21, 2022

Test #	Location	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
056	G48 – Facilities Office	70.1	**71.2**	603	ND (<3)	0.016	ND (<0.020)
057	G39 – Storage	70.5	**72.2**	565	ND (<3)	0.018	0.104
058	G43 – Office	74.1	**67.5**	561	ND (<3)	0.007	ND (<0.020)
059	G42A – Work Bench/Control Panel	77.8	59.9	598	ND (<3)	0.005	ND (<0.020)
060	G42 – Between AHU 3 & 4	77.0	64.0	591	ND (<3)	0.002	ND (<0.020)
Desired Comfort Range		~74 to 83	Less than 60 to 65	Less than 800 to ~1,150	< 5 to < 9	≤ 0.150	≤ 0.140

See Attachment B – Floor Plan for location of measurements

ppm = parts per million parts of air, by volume mg/m^3 = milligrams per cubic meter of air

ND = non-detect, below reliable limit of quantification or detection

REFERENCE VALUES

Carbon Dioxide (CO_2): ASHRAE maximum recommended CO_2 level indicating adequate supply of outdoor air = outdoor concentration + 700 ppm (i.e.,1,100 ppm); MA DPH maximum recommended CO_2 level = 800 ppm

Carbon Monoxide (CO): USGBC LEED (2009) 9 ppm, if outdoor measurement no greater than 2 ppm above outdoors

Temperature range guidelines based on ASHRAE 55-2020, at various levels of relativehumidity:

Relative Humidity	Winter Temperature	Summer Temperature
< 20%	70 to 79 ºF	76 to 83 ºF
20 to 40%	69 to 78 ºF	75 to 82 ºF
40 to 60%	68 to 77 ºF	74 to 81 ºFF

Temperature and Relative Humidity. Temperatures were within recommended comfort ranges for summer occupancy at the observed relative humidity levels.

All relative humidity measurements in the Housing and Juvenile Courthouse were below 65%, except for 3 of 28 test locations (215 – Conference Room B, 206 – Vestibule, and 221 – Security)

that were only slightly above 65%. No corrective measures are required based on the temperature and relative humidity measurements.

The majority of relative humidity measurements collected in the Roderick L. Ireland Courthouse were above 65%. Measurements collected on the fourth floor were all below 65%, however, a large percentage of rooms inspected between the Ground Floor and the third-floor had elevated measurements above 65%. Corrective actions should be taken to reduce indoor humidity levels throughout the building to improve occupant comfort and for optimum building conditions and maintenance.

Carbon Dioxide. The average CO_2 concentrations ranged from 457 to 888 ppm with an outdoor concentration of range of 405 to 425 ppm. The average CO_2 concentrations during the current occupancy conditions remained below the ASHRAE guideline (i.e., the outdoor concentration of approximately 400 ppm + 700 ppm).

Overall, the CO_2 measurements represent favorable findings, reflecting efforts to maintain good ventilation within the buildings.

Carbon Monoxide. The CO measurements were non-detect (< 3 ppm) and were within the recommended indoor air quality guideline. No corrective measures are indicated based on the CO measurements.

Total Volatile Organic Compounds (VOCs)

The average VOC measurements throughout the buildings ranged from non-detect (<0.020 ppm) to 0.370 ppm. Slightly increased VOC levels were detected in Conference Room 301 of the Housing and Juvenile Courthouse. TRC observed janitorial staff with a mop bucket in the conference room. The mop bucket has a strong orange cleaner odor that would likely be the cause of the slightly elevated measurement of 0.370 ppm. A strong perfume odor was observed in Office 154 of the Roderick L. Ireland Courthouse. This could likely be the cause of the slightly elevated measurement of 0.237 ppm. Although these measurements are slightly above the desired comfort range, these are not levels of concern, and no corrective measures are recommended at this time.

Airborne Particulate Matter

The average PM_{10} measurements throughout the buildings ranged from 0.001 to 0.020 mg/m^3 and were within the guideline of 0.150 mg/m^3.

Microbial Sampling

The results of air sampling for mold are presented in the table below. The air sampling results are presented in concentration units of spores per cubic meter of air (spores/m^3). The laboratory analytical report is included as Attachment A.

Microbial Sampling Results
Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts
July 21, 2022

Sample Number	Location	Sample Type	Mold Detected (spores/m³)	Interpretation
Springfield Housing & Juvenile Courthouse, 80 State Street, Springfield, MA				
4727006	Outdoor – 80 State North Entrance	Air	2,440	-----
4730984	101 – Office	Air	40	See Comment 1
4730672	144 – Office	Air	66	See Comment 1
4730974	152 – Juvenile Courtroom #3	Air	27	See Comment 1
4730791	B48 – Elevator Lobby	Air	26	See Comment 1
4730742	B30 – Conference Room	Air	40	See Comment 1
4730682	328 – Reception	Air	40	See Comment 1
4730890	245 – Office	Air	40	See Comment 1
4730902	301 – Conference Room	Air	13	See Comment 1
4730702	221 – Security	Air	26	See Comment 1
Roderick L. Ireland Courthouse, 50 State Street, Springfield, MA				
4730736	Outdoor – East Courtyard	Air	2,534	-----
4727058	427 – Employee Lounge	Air	40	See Comment 1
4730992	Probate Courtroom #4 – Conference Room B	Air	53	See Comment 1
4730915	Law Library – Northeast Corner	Air	13	See Comment 1
4730982	385 – DA Reception Desk	Air	26	See Comment 1
4727041	205 – Deliberation Room	Air	26	See Comment 1
4730921	230 – Lockup	Air	54	See Comment 1
4730875	121B – Judges Lobby	Air	27	See Comment 1
4730988	142 – Office	Air	13	See Comment 1
4730959	G01 – Office	Air	40	See Comment 1

Comment 1 – Indoor concentrations were below the concurrent outdoor concentration, and the types of spores identified were also detected outdoors or are commonly detected outdoors. These results are not suggestive of an indoor mold source.

In all the test locations, the air samples indicated total mold spore concentrations were below the concurrent outdoor concentration, and the types of mold detected indoors were similar to spore types detected outdoors or that are commonly detected outdoors. Thus, no indoor mold source was indicated in these areas based on the air sampling results.

It is important to note that construction materials, personal belongings, and indoor environments (including indoor air) are normally not sterile. Therefore, no structure can be completely free of microbial organisms including mold. However, under normal circumstances, commonly accepted industry guidelines suggest that the levels of fungi in the indoor environment should be generally similar to (or lower than) the outdoor air outside of the property. It should be understood that natural dust deposition also contains some amount of fungal spores.

RECOMMENDATIONS

Based on the findings of this assessment, TRC recommends the following for consideration:

1. No corrective measures are required based on measurements of temperature, carbon dioxide, carbon monoxide, PM_{10}, or TVOC's.

2. Corrective actions should be taken in the Roderick L. Ireland Courthouse to improve dehumidification. TRC will continue to observe relative humidity measurements throughout the summer months and will alert building management if any unusual levels are noted.

3. Continue to operate ventilation equipment to introduce the greatest amount of outdoor air feasible based on the equipment parameters and seasonal conditions. This will provide the greatest safety for building occupants and will also help to quickly dilute the air when disinfectant wipes, cleaners and hand sanitizers are used. Routine preventative maintenance of heating, ventilating and air-conditioning equipment should also be emphasized.

CONDITIONS AND LIMITATIONS

The visual inspection performed by TRC is limited to representative areas that were accessible at the time of inspection. Destructive and/or invasive inspections were not within the scope of our investigation. The sampling results reflect conditions at the time of sampling.

TRC has performed the tasks set forth above in a thorough and professional manner consistent with industry standards. TRC cannot guarantee and does not warrant that this limited assessment has revealed all potential adverse environmental conditions affecting the site.

No expressed or implied representation or warranty is included in this report except that the services were performed within the limits of the scope of work authorized by the client and the encountered site conditions.

TRC appreciates the opportunity to provide you with consulting services. If you have any questions or comments, please contact us. We look forward to working with you on future endeavors.

Very Truly Yours,
TRC

Olivia Smaracko
Senior Industrial Hygienist

Ann D. Eckmann, CIH
Industrial Hygiene Group Leader

Enc.: Attachment A – Laboratory Results and Chain of Custody
Attachment B – Sample Location Drawings

ATTACHMENT A – LABORATORY RESULTS AND CHAIN OF CUSTODY

HAYES MICROBIAL CONSULTING

#22027691

Analysis Report prepared for

TRC Companies

814 Broad Street
Weymouth, MA 02189

Phone: **(781) 337-0016**

499949
Springfield District Court
50 & 80 State Street
Springfield, MA

Collected: **July 21, 2022**
Received: **July 25, 2022**
Reported: **July 25, 2022**

We would like to thank you for trusting Hayes Microbial for your analytical needs!
We received 20 samples by FedEx in good condition for this project on July 25th, 2022.

The results in this analysis pertain only to this job, collected on the stated date, and should not be used in the interpretation of any other job. This report may not be duplicated, except in full, without the written consent of Hayes Microbial Consulting, LLC..

This laboratory bears no responsibility for sample collection activities, analytical method limitations, or your use of the test results. Interpretation and use of test results are your responsibility. Any reference to health effects or interpretation of mold levels is strictly the opinion of Hayes Microbial. In no event, shall Hayes Microbial or any of its employees be liable for lost profits or any special, incidental or consequential damages arising out of the use of these test results.

Steve Hayes, BSMT(ASCP)
Laboratory Director
Hayes Microbial Consulting, LLC.

EPA Laboratory ID: VA01419

Lab ID: #188863

DPH License: #PH-0198

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499949
Springfield District Court
50 & 80 State Street
Springfield, MA

#22027691

Spore Trap
SOP - HMC#101

Sample Number	1	4727006		2	4730984		3	4730672		4	4730974	
Sample Name	**Outdoor - Main Ent. Of Juv.**			**101 - Clerk Head Admin Asst.**			**144 - Office**			**152 - Juvenile Courtroom 3**		
Sample Volume	75.00 liter			75.00 liter			75.00 liter			75.00 liter		
Reporting Limit	13 spores/m^3			13 spores/m^3			13 spores/m^3			13 spores/m^3		
Background	2			2			2			2		
Fragments	13/m^3			ND			ND			ND		
Organism	**Raw Count**	**Count / m^3**	**% of Total**	**Raw Count**	**Count / m^3**	**% of Total**	**Raw Count**	**Count / m^3**	**% of Total**	**Raw Count**	**Count / m^3**	**% of Total**
Alternaria												
Ascospores	86	1147	47.0%	2	27	66.7%	3	40	60.0%	2	27	100.0%
Aspergillus|Penicillium	15	200	8.2%	1	13	33.3%	1	13	20.0%			
Basidiospores	29	387	15.8%									
Bipolaris|Drechslera												
Chaetomium												
Cladosporium	46	613	25.1%				1	13	20.0%			
Curvularia	1	13	<1%									
Epicoccum	1	13	<1%									
Fusarium												
Memnoniella												
Myxomycetes	5	67	2.7%									
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	183	2440	100%	3	40	100%	5	66	100%	2	27	100%

Water Damage Indicator | Common Allergen | Slightly Higher than Baseline | Significantly Higher than Baseline | Ratio Abnormality

Collected: **Jul 21, 2022** Received: **Jul 25, 2022** Reported: **Jul 25, 2022**

HAYES MICROBIAL CONSULTING

Project Analyst: Steve Hayes, BSMT Stephen N. Hayes Date: **07 - 25 - 2022**

Reviewed By: Ramesh Poluri, PhD P. Ramesh Date: **07 - 25 - 2022**

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499949
Springfield District Court
50 & 80 State Street
Springfield, MA

#22027691

Spore Trap
SOP - HMC#101

Sample Number	5	4730791		6	4730742		7	4730683		8	4730890	
Sample Name	**B48 - Elevator Lobby**			**B30 - Conference Room**			**328 - Reception**			**245 - Office**		
Sample Volume	75.00 liter			75.00 liter			75.00 liter			75.00 liter		
Reporting Limit	13 spores/m³			13 spores/m³			13 spores/m³			13 spores/m³		
Background	2			2			2			2		
Fragments	ND			ND			ND			ND		
Organism	**Raw Count**	**Count / m³**	**% of Total**	**Raw Count**	**Count / m³**	**% of Total**	**Raw Count**	**Count / m³**	**% of Total**	**Raw Count**	**Count / m³**	**% of Total**
Alternaria												
Ascospores				2	27	66.7%	2	27	66.7%			
Aspergillus|Penicillium	1	13	50.0%							1	13	33.3%
Basidiospores												
Bipolaris|Drechslera												
Chaetomium												
Cladosporium	1	13	50.0%				1	13	33.3%	2	27	66.7%
Curvularia				1	13	33.3%						
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes												
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	2	26	100%	3	40	100%	3	40	100%	3	40	100%

Water Damage Indicator | Common Allergen | Slightly Higher than Baseline | Significantly Higher than Baseline | Ratio Abnormality

Collected: **Jul 21, 2022** Received: **Jul 25, 2022** Reported: **Jul 25, 2022**

HAYES MICROBIAL CONSULTING

Project Analyst: Steve Hayes, BSMT — Date: **07 - 25 - 2022**

Reviewed By: Ramesh Poluri, PhD — Date: **07 - 25 - 2022**

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#22027691

Spore Trap
SOP - HMC#101

Sample Number	9	4730890		10	4730702		11	4730736		12	4727058	
Sample Name	**245 - Office**			**221 - Security**			**Outdoor - Courtyard**			**427 - Employee Lounge**		
Sample Volume	75.00 liter			75.00 liter			75.00 liter			75.00 liter		
Reporting Limit	13 spores/m³			13 spores/m³			13 spores/m³			13 spores/m³		
Background	2			2			2			2		
Fragments	ND			ND			13/m³			ND		
Organism	**Raw Count**	**Count / m³**	**% of Total**	**Raw Count**	**Count / m³**	**% of Total**	**Raw Count**	**Count / m³**	**% of Total**	**Raw Count**	**Count / m³**	**% of Total**
Alternaria							2	27	1.1%			
Ascospores	1	13	100.0%	1	13	50.0%	70	933	36.8%	2	27	66.7%
Aspergillus|Penicillium							18	240	9.5%	1	13	33.3%
Basidiospores							28	373	14.7%			
Bipolaris|Drechslera												
Chaetomium												
Cladosporium				1	13	50.0%	68	907	35.8%			
Curvularia							2	27	1.1%			
Epicoccum							2	27	1.1%			
Fusarium												
Memnoniella												
Myxomycetes												
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	1	13	100%	2	26	100%	190	2534	100%	3	40	100%

Water Damage Indicator | Common Allergen | Slightly Higher than Baseline | Significantly Higher than Baseline | Ratio Abnormality

Collected: **Jul 21, 2022** Received: **Jul 25, 2022** Reported: **Jul 25, 2022**

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Spore Trap
SOP - HMC#101

Sample Number	13	47309925		14	4730915		15	4730982		16	4727041	
Sample Name	**PC4 - Conference Room B**			**Law Library - NE Corner**			**385 - DA Receptionist**			**205 - Deliberation Room**		
Sample Volume	75.00 liter			75.00 liter			75.00 liter			75.00 liter		
Reporting Limit	13 spores/m^3			13 spores/m^3			13 spores/m^3			13 spores/m^3		
Background	2			1			2			2		
Fragments	ND			ND			ND			ND		
Organism	**Raw Count**	**Count / m^3**	**% of Total**	**Raw Count**	**Count / m^3**	**% of Total**	**Raw Count**	**Count / m^3**	**% of Total**	**Raw Count**	**Count / m^3**	**% of Total**
Alternaria												
Ascospores	1	13	25.0%	1	13	100.0%	1	13	50.0%	1	13	50.0%
Aspergillus|Penicillium							1	13	50.0%			
Basidiospores												
Bipolaris|Drechslera												
Chaetomium												
Cladosporium	3	40	75.0%									
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes												
Pithomyces										1	13	50.0%
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	4	53	100%	1	13	100%	2	26	100%	2	26	100%

Water Damage Indicator | Common Allergen | Slightly Higher than Baseline | Significantly Higher than Baseline | Ratio Abnormality

Collected: **Jul 21, 2022** Received: **Jul 25, 2022** Reported: **Jul 25, 2022**

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Spore Trap
SOP - HMC#101

Sample Number	17	4730921		18	4730875		19	4730988		20	4730959	
Sample Name	**230 - Lockup**			**121B - Judges Lobby**			**142 - Office**			**G01 - Office**		
Sample Volume	75.00 liter			75.00 liter			75.00 liter			75.00 liter		
Reporting Limit	13 spores/m³			13 spores/m³			13 spores/m³			13 spores/m³		
Background	2			2			2			2		
Fragments	ND			ND			ND			ND		
Organism	**Raw Count**	**Count / m³**	**% of Total**	**Raw Count**	**Count / m³**	**% of Total**	**Raw Count**	**Count / m³**	**% of Total**	**Raw Count**	**Count / m³**	**% of Total**
Alternaria												
Ascospores	2	27	50.0%				1	13	100.0%	2	27	66.7%
Aspergillus|Penicillium	2	27	50.0%	2	27	100.0%						
Basidiospores												
Bipolaris|Drechslera												
Chaetomium												
Cladosporium										1	13	33.3%
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes												
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	4	54	100%	2	27	100%	1	13	100%	3	40	100%

Water Damage Indicator | Common Allergen | Slightly Higher than Baseline | Significantly Higher than Baseline | Ratio Abnormality

Collected: **Jul 21, 2022** Received: **Jul 25, 2022** Reported: **Jul 25, 2022**

HAYES MICROBIAL CONSULTING

Project Analyst: Steve Hayes, BSMT — Date: **07 - 25 - 2022**

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Spore Trap Information

Reporting Limit	The Reporting Limit is the lowest number of spores that can be detected based on the total volume of the sample collected and the percentage of the slide that is counted. At Hayes Microbial, 100% of the slide is read so the LOD is based solely on the total volume. Raw spore counts that exceed 500 spores will be estimated.
Blanks	Results have not been corrected for field or laboratory blanks.
Background	The Background is the amount of debris that is present in the sample. This debris consists of skin cells, dirt, dust, pollen, drywall dust and other organic and non-organic matter. As the background density increases, the likelihood of spores, especially small spores such as those of Aspergillus and Penicillium may be obscured. The background is rated on a scale of 1 to 5 and each level is determined as follows: **NBD:** No background detected due to possible pump or cassette malfunction. Recollect sample. (Field Blanks will display NBD) **1 :** <5% of field occluded. No spores will be uncountable. **2 :** 5-25% of field occluded. **3 :** 25-75% of field occluded. **4 :** 75-90% of field occluded. **5 :** >90% of field occluded. Suggested recollection of sample.
Fragments	Fragments are small pieces of fungal mycelium or spores. They are not identifiable as to type and when present in very large numbers, may indicate the presence of mold amplification.
Control Comparisons	There are no national standards for the numbers of fungal spores that may be present in the indoor environment. As a general rule and guideline that is widely accepted in the indoor air quality field, the numbers and types of spores that are present in the indoor environment should not exceed those that are present outdoors at any given time. There will always be some mold spores present in "normal" indoor environments. The purpose of sampling and counting spores is to help determine whether an abnormal condition exists within the indoor environment and if it does, to help pinpoint the area of contamination. Spore counts should not be used as the sole determining factor of mold contamination. There are many factors that can cause anomalies in the comparison of indoor and outdoor samples due to the dynamic nature of both of those environments.
Water Damage Indicator Common Allergen Slightly Higher than Baseline Significantly Higher than Baseline Ratio Abnormality	**Blue:** These molds are commonly seen in conditions of prolonged water intrusion and usually indicate a problem. **Green:** Although all molds are potential allergens, these are the most common allergens that may be found indoors. **Orange:** The spore count is slightly higher than the outside count and may or may not indicate a source of contamination. **Red:** The spore count is significantly higher than the baseline count and probably indicates a source of contamination. **Violet:** The types of spores found indoors should be similar to the ones that were identified in the baseline sample. Significant increases (more than 25%) in the ratio of a particular spore type may indicate the presence of abnormal levels of mold, even if the total number of spores of that type is lower in the indoor environment than it was outdoors.
Color Coding	Fungi that are present in indoor samples at levels lower than 200 per cubic meter are not color coded on the report, unless they are one of the water damage indicators.

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Organism Descriptions

Alternaria

Habitat: Commonly found outdoors in soil and decaying plants. Indoors, it is commonly found on window sills and other horizontal surfaces.

Effects: A common allergen and has been associated with hypersensitivity pneumonitis. Alternaria is capable of producing toxic metabolites which may be associated with disease in humans or animals. Occasionally an agent of onychomycosis, ulcerated cutaneous infection and chronic sinusitis, principally in the immunocompromised patient.

Ascospores

Habitat: A large group consisting of more than 3000 species of fungi. Common plant pathogens and outdoor numbers become very high following rain. Most of the genera are indistinguishable by spore trap analysis and are combined on the report.

Effects: Health affects are poorly studied, but many are likely to be allergenic.

Aspergillus|Penicillium

Habitat: The most common fungi isolated from the environment. Very common in soil and on decaying plant material. Are able to grow well indoors on a wide variety of substrates.

Effects: This group contains common allergens and many can cause hypersensitivity pneumonitis. They may cause extrinsic asthma, and many are opportunistic pathogens. Many species produce mycotoxins which may be associated with disease in humans and other animals. Toxin production is dependent on the species, the food source, competition with other organisms, and other environmental conditions.

Basidiospores

Habitat: A common group of Fungi that includes the mushrooms and bracket fungi. They are saprophytes and plant pathogens. In wet conditions they can cause structural damage to buildings.

Effects: Common allergens and are also associated with hypersensitivity pneumonitis.

Cladosporium

Habitat: One of the most common genera worldwide. Found in soil and plant debris and on the leaf surfaces of living plants. The outdoor numbers are lower in the winter and often relatively high in the summer, especially in high humidity. The outdoor numbers often spike in the late afternoon and evening. Indoors, it can be found growing on textiles, wood, sheetrock, moist window sills and in HVAC supply ducts.

Effects: A common allergen, producing more than 10 allergenic antigens and a common cause of hypersensitivity pneumonitis.

Curvularia

Habitat: They exist in soil and plant debris, and are plant pathogens.

Effects: They are allergenic and a common cause of allergic fungal sinusitis. An occasional cause of human infection, including keratitis, sinusitis, onychomycosis, mycetoma, pneumonia, endocarditis and desseminated infection, primarily in the immunocompromised.

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Organism Descriptions

Epicoccum

Habitat: It is found in soil and plant litter and is a plant pathogen. It can grow indoors on a variety of substrates, including paper and textiles and is commonly found on wet drywall.

Effects: It is a common allergen. No cases of infection have been reported in humans.

Myxomycetes

Habitat: Found on decaying plant material and as a plant pathogen.

Effects: Some allergenic properties reported, but generally pose no health concerns to humans.

Pithomyces

Habitat: Common fungus isolated from soil, decaying plant material. Rarely found indoors.

Effects: Allergenic properties are poorly studied. No cases of infection in humans.

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SHIP: FEDEX - PAK SO
DATE: 07-25-2022

8170 3738 7196

MOLD
22027691

Job Number: 499949	Job Name: Springfield District Court 50 & 80 State Street Springfield, MA	le: (781) 789-2985	Email: osmaracko@trccompanies.co
or: Olivia Smaracko			
Date Collected: 7-21-22		Note: Visit 3	

Analysis Type		Analysis Description	Turnaround	Accepted Media Types
Spore Trap	S	Identification & Enumeration of Fungal Spores	24 Hour	Air Cassettes, Impact Slides
	S+	Spore Trap Analysis with Dander, Fiber, and Pollen counts	24 Hour	Air Cassettes, Impact Slides
Direct ID	D	ID & Semi-Quantative Enumeration of spores and mycelium	24 Hour	Bio-Tape, Tape, Swab, Bulk, Agar Plate
	D+	Direct Analysis with Fully Quantitative spore count	24 Hour	Bio-Tape, Tape, Swab, Bulk, Agar Plate
Culture	C1	Identification & Enumeration of Mold only	7 Day	Air Plate, Agar Plate, Swab, Bulk
	C2	Identification & Enumeration of Bacteria only	4 Day	Air Plate, Agar Plate, Swab, Bulk
	C3	Identification & Enumeration of Mold and Bacteria	7 Day	Air Plate, Agar Plate, Swab, Bulk
	C5	Coliform Screen for Sewage Bacteria	2 Day	Agar Plate, Swab, Bulk
Particle	TPA	Total Particulate Analysis, ID & Count (Does Not Include Mold)	24 Hour	Air Cassettes, Impact Slides, Bio-Tape

AD

#	Number	Sample	Analysis	Volume	Notes
1	4727006	Outdoor - North Ent of Juv	S	75 L	
2	4730984	101 - Clerk Head Admin Asst	S	75 L	
3	4730672	144 - Office	S	75 L	
4	4730974	152 - Juvenile Courtroom 3	S	75 L	
5	4730791	B48 - Elevator Lobby	S	75 L	
6	4730742	B30 - Conference Room	S	75 L	
7	4730683	328 - Reception	S	75 L	
8	4730890	245 - Office	S	75 L	
9	4730902	301 - Conference Room	S	75 L	
10	4730702	221 - Security	S	75 L	
11	4730736	Outdoor - Courtyard	S	75 L	
12	4727058	427 - Employee Lounge	S	75 L	
13	4730992	PC4 - Conference Room B	S	75 L	
14	4730915	Law Library - NE Corner	S	75 L	
15	4730982	385 - DA Receptionist	S	75 L	
16	4727041	905 - Deliberation Room	S	75 L	

Released by:	Date: 7/21/22	Received By: ZR	Date: 7-25-22

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MOLD
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or: Olivia Smaracko			
Date Collected: 7/21/22		Note: Visit 3	

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	S+	Spore Trap Analysis with Dander, Fiber, and Pollen counts	24 Hour	Air Cassettes, Impact Slides
Direct ID	D	ID & Semi-Quantative Enumeration of spores and mycelium	24 Hour	Bio-Tape, Tape, Swab, Bulk, Agar Plate
	D+	Direct Analysis with Fully Quantitative spore count	24 Hour	Bio-Tape, Tape, Swab, Bulk, Agar Plate
Culture	C1	Identification & Enumeration of Mold only	7 Day	Air Plate, Agar Plate, Swab, Bulk
	C2	Identification & Enumeration of Bacteria only	4 Day	Air Plate, Agar Plate, Swab, Bulk
	C3	Identification & Enumeration of Mold and Bacteria	7 Day	Air Plate, Agar Plate, Swab, Bulk
	C5	Coliform Screen for Sewage Bacteria	2 Day	Agar Plate, Swab, Bulk
Particle	TPA	Total Particulate Analysis, ID & Count (Does Not Include Mold)	24 Hour	Air Cassettes, Impact Slides, Bio-Tape

AD

#	Number	Sample	Analysis	Volume	Notes
1	7 4730921	230 - Lockup	S	75 L	
2	8 4730875	121B - Judges Lobby	S	75 L	
3	9 4730988	142 - Office	S	75 L	
4	20 4730959	601 - Office	S	75 L	
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Released by:	Date: 7/21/22	Received By: ZR	Date: 7-25-22