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November 17, 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 18
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 November 3, 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 is 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 to total dust is 15 mg/m^3, and for the respirable dust fraction, 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 Air-O-Cell 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 Air-O-Cell 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 molds 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
November 3, 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							
001	G24 – Holding Cell	69.2	44.5	644	ND (<3)	0.009	ND (<0.020)
002	G35 – Security	69.9	38.3	590	ND (<3)	0.025	ND (<0.020)
003	G55 – Office	72.2	38.7	566	ND (<3)	0.009	ND (<0.020)
004	G40A – File Room	72.4	41.2	544	ND (<3)	0.005	ND (<0.020)
005	Hallway outside G30 – Electrical Room	72.3	39.2	572	ND (<3)	0.007	ND (<0.020)

Indoor Air Quality Measurements Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts November 3, 2022							
Test #	**Location**	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
006	G02A – Storage	70.1	40.2	561	ND (<3)	0.009	ND (<0.020)
007	114A – District Attorney	69.7	40.3	556	ND (<3)	0.005	ND (<0.020)
008	153 - Office	70.4	41.3	586	ND (<3)	0.007	ND (<0.020)
009	139 – Office	72.7	37.6	588	ND (<3)	0.010	ND (<0.020)
010	District Courtroom #1	73.6	36.8	575	ND (<3)	0.007	ND (<0.020)
011	110 – Breakroom	70.8	40.4	679	ND (<3)	0.007	ND (<0.020)
012	110B – Clerk of District Court Criminal	70.2	42.1	694	ND (<3)	0.013	ND (<0.020)
013	Superior Courtroom #7	71.9	40.5	714	ND (<3)	0.007	ND (<0.020)
014	Stairwell #1, 2nd Floor Landing	72.8	38.2	640	ND (<3)	0.009	ND (<0.020)
015	225 – Office	73.5	37.4	611	ND (<3)	0.006	ND (<0.020)
016	214 – Office	74.2	37.6	647	ND (<3)	0.009	ND (<0.020)
017	207 – Judges Lobby	70.8	38.9	696	ND (<3)	0.011	ND (<0.020)
018	206 – Judges Lobby	68.7	41.7	646	ND (<3)	0.010	ND (<0.020)

Indoor Air Quality Measurements
Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts
November 3, 2022

Test #	Location	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
019	391 – Clerk of Superior Court, Counter	72.2	39.6	658	ND (<3)	0.007	ND (<0.020)
020	317 – Judges Lobby	71.5	39.5	666	ND (<3)	0.008	ND (<0.020)
021	Superior Courtroom #3	71.4	37.5	619	ND (<3)	0.007	ND (<0.020)
022	Hallway outside 329 – Electrical Room	73.3	38.0	732	ND (<3)	0.012	ND (<0.020)
023	Stairwell #1, 3rd Floor Landing	73.8	37.8	732	ND (<3)	0.010	ND (<0.020)
024	354 – Office	74.4	37.1	731	ND (<3)	0.010	ND (<0.020)
025	Registry of Probate	72.8	34.6	702	ND (<3)	0.011	ND (<0.020)
026	445B – Office	72.4	36.8	802	ND (<3)	0.009	ND (<0.020)
027	Probate Courtroom #2	72.6	36.5	679	ND (<3)	0.008	ND (<0.020)
028	Probate Courtroom #1	72.5	36.1	662	ND (<3)	0.007	ND (<0.020)
029	413 - Office	69.5	37.2	594	ND (<3)	0.007	ND (<0.020)
030	Stairwell #3, 4th Floor Landing	68.0	39.6	587	ND (<3)	0.008	ND (<0.020)
031	Outdoor – Front Entrance 50 State Street	56.7	46.3	465	ND (<3)	0.031	ND (<0.020)
Springfield Housing & Juvenile Courthouse, 80 State Street, Springfield, MA							

Indoor Air Quality Measurements Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts November 3, 2022							
Test #	**Location**	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
032	Outdoor – Front Entrance 80 State Street	55.3	50.0	460	ND (<3)	0.040	ND (<0.020)
033	111 – Waiting Area	64.6	52.3	789	ND (<3)	0.014	ND (<0.020)
034	106 – Vestibule	70.3	43.6	827	ND (<3)	0.023	ND (<0.020)
035	155 – Waiting Area	72.3	40.8	731	ND (<3)	0.009	ND (<0.020)
036	Stairwell #4, 1st Floor Waiting Area	73.0	39.3	710	ND (<3)	0.012	ND (<0.020)
037	138 – Office	72.9	38.5	713	ND (<3)	0.012	ND (<0.020)
038	119 - Juvenile Courtroom #2	73.1	37.3	560	ND (<3)	0.009	ND (<0.020)
039	125 – Waiting Area	74.0	38.3	743	ND (<3)	0.014	ND (<0.020)
040	B44 – Holding Cell	72.6	37.3	564	ND (<3)	0.009	ND (<0.020)
041	B73 – Holding Cell	72.4	38.3	540	ND (<3)	0.008	ND (<0.020)
042	B55 – Electrical Room	71.5	36.4	494	ND (<3)	0.020	ND (<0.020)
043	B46 – Mechanical Room	71.8	38.2	512	ND (<3)	0.025	ND (<0.020)
044	B23 – Office	71.7	39.4	661	ND (<3)	**0.159**	ND (<0.020)

Indoor Air Quality Measurements Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts November 3, 2022							
Test #	**Location**	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
045	B04 – File Storage	71.1	39.1	526	ND (<3)	0.014	ND (<0.020)
046	B01 – Storage	70.8	40.9	502	ND (<3)	0.015	ND (<0.020)
047	328 – Reception Desk	73.8	42.3	827	ND (<3)	0.018	ND (<0.020)
048	337 – Vestibule	75.1	40.0	826	ND (<3)	0.015	ND (<0.020)
049	332 – Closet	75.0	39.4	792	ND (<3)	0.010	ND (<0.020)
050	345 – Closet	72.9	40.5	842	ND (<3)	0.011	ND (<0.020)
051	250 – Office	76.4	41.0	917	ND (<3)	0.007	ND (<0.020)
052	253 – Office	76.3	41.1	1,016	ND (<3)	0.008	ND (<0.020)
053	240 – Office	74.8	41.5	948	ND (<3)	0.010	ND (<0.020)
054	227 – Office	74.7	41.7	882	ND (<3)	0.009	ND (<0.020)
055	211 – Corridor	74.5	42.6	986	ND (<3)	0.009	ND (<0.020)
056	222 – Juvenile Courtroom #1	74.5	37.6	728	ND (<3)	0.011	ND (<0.020)
057	214 – Waiting Area	75.1	44.2	1,160	ND (<3)	0.020	0.059

Indoor Air Quality Measurements
Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts
November 3, 2022

Test #	Location	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
058	307 – Breakroom	75.9	39.1	836	ND (<3)	0.012	ND (<0.020)
059	317 – Stairwell #5 Landing	76.3	40.3	875	ND (<3)	0.053	0.102
060	313 – Waiting Area	75.9	39.2	858	ND (<3)	0.015	0.033
Desired Comfort Range		~67 to 82	Less than 60 to 65	Less than 800 to ~1,100	< 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 ºF

Temperature and Relative Humidity.

Temperatures were generally within the recommended comfort ranges for seasonal occupancy at the observed relative humidity levels.

All relative humidity measurements collected in the Roderick L. Ireland Courthouse were below 65%. As we continue to head into the heating season, the use of dehumidifying equipment and

actions to reduce indoor humidity levels throughout the building to improve occupant comfort and for optimum building conditions and maintenance will become less necessary.

With all the relative humidity measurements below the acceptable range, no corrective measures are required based on the temperature and relative humidity measurements in this building.

Carbon Dioxide.

The average CO_2 concentrations throughout the buildings ranged from 494 to 1,160 ppm and outdoor concentrations ranged from 460 to 465 ppm. All 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), with most being below the more stringent MA DPH guideline (800 ppm). However, it was noted that CO_2 concentrations measured in the 80 State Street building were higher than previous surveys, especially on the 2nd and 3rd floors. All 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).

All VOC measurements throughout the buildings ranged from non-detect (<0.020 ppm) to 0.102 ppm. All VOC measurements were below the desired comfort range and occupational exposure limits for common VOCs that are likely to be present in buildings. Therefore, no corrective measures are recommended at this time. Note that hand sanitizers and sanitizing wipes may be a source of temporary increases in VOC concentrations.

Airborne Particulate Matter.

The average PM_{10} measurements throughout the buildings ranged from 0.005 mg/m^3 to 0.159 mg/m^3. Most measurements were below the guideline of 0.150 mg/m^3, apart from the measurement collected in Office B23. It was noted that construction being conducted in Room B20 (i.e., sanding of new joint compound) may have resulted in dust and debris on the carpeting in this room. Better housekeeping in areas of construction is recommended as a corrective measure based on the PM_{10} measurements.

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 November 3, 2022				
Sample Number	**Location**	**Sample Type**	**Mold Detected (spores/m³)**	**Interpretation**
Roderick L. Ireland Courthouse, 50 State Street, Springfield, MA				
4729472	G24 – Holding Cell	Air	40	See Comment 1
4729452	114A – District Attorney	Air	27	See Comment 1
4729356	110B – Clerk of District Court Criminal	Air	54	See Comment 1
4729259	Superior Courtroom #7	Air	26	See Comment 1
4729477	207 – Judges Lobby	Air	40	See Comment 1
4729563	317 – Judges Lobby	Air	13	See Comment 1
4729197	354 – Office	Air	40	See Comment 1
4729664	Registry of Probate	Air	26	See Comment 1
4729466	413 - Office	Air	27	See Comment 1
4729367	Outdoors Front 50 State Street	Air	1,680	-----
Springfield Housing & Juvenile Courthouse, 80 State Street, Springfield, MA				
4729657	Outdoors, Front 80 State Street	Air	1,174	-----
4729392	106 – Vestibule	Air	27	See Comment 1
4729497	138 – Office	Air	27	See Comment 1
4729687	125 – Waiting Area	Air	160	See Comment 1
4729364	B23 – Office	Air	54	See Comment 1
4729435	B04 – File Storage	Air	27	See Comment 1
4729578	328 – Reception Desk	Air	94	See Comment 1
4729151	227 – Office	Air	40	See Comment 1
4729300	211 – Corridor	Air	53	See Comment 1
4729328	313 – Waiting Area	Air	133	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 sample results indicated total mold spore concentrations were below the concurrent outdoor concentration, and the types of molds detected indoors were similar to spore types that were or 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 number 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, or TVOC's. The slightly elevated PM_{10} levels in Room B20 were probably due to construction activities and it is recommended that housekeeping activities (dusting, sweeping, vacuuming, etc.) be increased in areas where construction activities are occurring.

2. TRC will continue to observe relative humidity through the fall season and will alert building management if any unusual levels are noted. Efforts to maintain relative humidity to levels below 65% are no longer necessary this season, given the lower outdoor temperature and relative humidity conditions.

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

Robert King, CSP, CIH (1982-2021)
Senior EHS Engineer

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

#22044404

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: **November 3, 2022**
Received: **November 4, 2022**
Reported: **November 4, 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 November 4th, 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

#22044404

Spore Trap
SOP - HMC#101

Sample Number	1	4729472		2	4729452		3	4726356		4	4729259	
Sample Name	G24 - Holding Cell			114A - District Attorney			110B - Cubicle Area			Superior Courtroom #7		
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	ND			ND			13/m^3			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	2	27	66.7%	2	27	100.0%	2	27	50.0%	1	13	50.0%
Aspergillus|Penicillium												
Basidiospores												
Bipolaris|Drechslera												
Chaetomium												
Cladosporium	1	13	33.3%				2	27	50.0%	1	13	50.0%
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes												
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	3	40	100%	2	27	100%	4	54	100%	2	26	100%

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

Collected: **Nov 3, 2022** Received: **Nov 4, 2022** Reported: **Nov 4, 2022**

HAYES MICROBIAL CONSULTING

Project Analyst: Ronzo Lee, Date: **11 - 04 - 2022**

Reviewed By: Steve Hayes, BSMT Date: **11 - 04 - 2022**

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Springfield District Court
50 & 80 State Street
Springfield, MA

#22044404

Spore Trap
SOP - HMC#101

Sample Number	5	4729477		6	4729563		7	4729197		8	4729664	
Sample Name	**207 - Judges Lobby**			**317 - Judges Lobby**			**354 - Office**			**Registry of Probate**		
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	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	2	27	66.7%	1	13	100.0%	1	13	33.3%	1	13	50.0%
Aspergillus|Penicillium												
Basidiospores												
Bipolaris|Drechslera												
Chaetomium												
Cladosporium							2	27	66.7%			
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes	1	13	33.3%							1	13	50.0%
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	3	40	100%	1	13	100%	3	40	100%	2	26	100%

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

Collected: **Nov 3, 2022** Received: **Nov 4, 2022** Reported: **Nov 4, 2022**

HAYES MICROBIAL CONSULTING

Project Analyst: Ronzo Lee, Date: **11 - 04 - 2022**

Reviewed By: Steve Hayes, BSMT Date: **11 - 04 - 2022**

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Weymouth, MA 02189
(781) 337-0016

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

#22044404

Spore Trap
SOP - HMC#101

Sample Number	9	4729466		10	4729367		11	4729657		12	4729392	
Sample Name	**413 Office**			**50 State - Outdoor**			**80 State - Outdoor**			**106 - Vestibule**		
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	ND			ND			13/m^3			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	2	27	100.0%	65	867	51.6%	52	693	59.1%	2	27	100.0%
Aspergillus|Penicillium				10	133	7.9%	6	80	6.8%			
Basidiospores				6	80	4.8%	5	67	5.7%			
Bipolaris|Drechslera												
Chaetomium												
Cladosporium				42	560	33.3%	23	307	26.1%			
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes				3	40	2.4%	2	27	2.3%			
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	2	27	100%	126	1680	100%	88	1174	100%	2	27	100%

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

Collected: **Nov 3, 2022** Received: **Nov 4, 2022** Reported: **Nov 4, 2022**

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Reviewed By: Steve Hayes, BSMT Date: **11 - 04 - 2022**

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Spore Trap
SOP - HMC#101

Sample Number	13	4729497		14	4729687		15	4729364		16	4729435	
Sample Name	**138 - Office**			**125 - Waiting Area**			**B23 - Office**			**B04 - File Storage**		
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	100.0%	6	80	50.0%	2	27	50.0%	2	27	100.0%
Aspergillus|Penicillium				3	40	25.0%						
Basidiospores												
Bipolaris|Drechslera												
Chaetomium												
Cladosporium							2	27	50.0%			
Curvularia												
Epicoccum				1	13	8.3%						
Fusarium												
Memnoniella												
Myxomycetes				2	27	16.7%						
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	2	27	100%	12	160	100%	4	54	100%	2	27	100%

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

Collected: **Nov 3, 2022** Received: **Nov 4, 2022** Reported: **Nov 4, 2022**

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Project Analyst: Ronzo Lee, Date: **11 - 04 - 2022**

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Spore Trap
SOP - HMC#101

Sample Number	17	4729578		18	4729151		19	4729300		20	4729328	
Sample Name	**328 - Reception Desk**			**227 - Office**			**211 - Corridor**			**313 - Waiting Area**		
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	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	3	40	42.9%	2	27	66.7%	2	27	50.0%	3	40	30.0%
Aspergillus|Penicillium	2	27	28.6%							3	40	30.0%
Basidiospores							1	13	25.0%	1	13	10.0%
Bipolaris|Drechslera												
Chaetomium												
Cladosporium	2	27	28.6%	1	13	33.3%	1	13	25.0%	2	27	20.0%
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes												
Pithomyces										1	13	10.0%
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	7	94	100%	3	40	100%	4	53	100%	10	133	100%

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

Collected: **Nov 3, 2022** Received: **Nov 4, 2022** Reported: **Nov 4, 2022**

HAYES MICROBIAL CONSULTING

Project Analyst: Ronzo Lee, Date: **11 - 04 - 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

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.

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.

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Organism Descriptions

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: 11-04-2022

8170 3738 6925

MOLD
22044404

Job Number: 499949	Job Name: Springfield District Court 50 & 80 State Street Springfield, MA
or: Olivia Smaracko	e: (781) 789-2985 Email: osmaracko@trccompanies.co
Date Collected: 11/3/22	Note: Site Visit 18

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

#	Number	Sample	Analysis	Volume	Notes
1	4729472	G24 - Holding Cell	S	75 L	
2	4729452	114A - District Attorney	S	75 L	
3	4726356	110B - Cubicle Area	S	75 L	
4	4729259	Superior Courtroom #7	S	75 L	
5	4729477	207 - Judges Lobby	S	75 L	
6	47295c3	317 - Judges Lobby	S	75 L	
7	4729197	354 - Office	S	75 L	
8	47296464	Registry of Probate	S	75 L	
9	47294466	413D Office	S	75 L	
10	4729367	50 State - Outdoor	S	75 L	
11	4729657	80 State - Outdoor	S	75 L	
12	4729392	106 - Vestibule	S	75 L	
13	4729497	138 - Office	S	75 L	
14	47296087	125 - Waiting Area	S	75 L	
15	4729364	B23 - Office	S	75 L	
16	4729435	B04 - File Storage	S	75 L	

Released by:	Date: 11/3/22	Received By: EO	Date: 11/4

HAYES MICROBIAL CONSULTING

TRC Companies
814 Broad Street
Weymouth, MA 02189

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SHIP: FEDEX - PAK SO
DATE: 11-04-2022

8170 3738 6925

MOLD
22044404

Job Number: 499949	Job Name: Springfield District Court 50 & 80 State Street Springfield, MA
or: Olivia Smaracko	le: (781) 789-2985 Email: osmaracko@trccompanies.co
Date Collected: 11/3/22	Note: Site Visit 18

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

#	Number	Sample	Analysis	Volume	Notes
1	4729578	328-Reception Desk	S	75 L	
2	4729151	227-Office	S	75 L	
3	4729300	211-Corridor	S	75 L	
4	4729308	313-Waiting Area	S	75 L	
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Released by:	Date: 11/3/22	Received By: EO	Date: 11/4