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October 12, 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 13
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 September 29, 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 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
September 29, 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	453 – Womens Room	71.7	48.4	477	ND (<3)	0.002	ND (<0.020)
002	Registry of Probate	69.5	40.1	479	ND (<3)	0.003	ND (<0.020)
003	Probate Department – Desk Area	69.6	38.3	450	ND (<3)	0.002	ND (<0.020)
004	Probate Courtroom #4	69.7	44.0	461	ND (<3)	0.002	ND (<0.020)
005	428B – Judges Lobby	68.7	41.8	554	ND (<3)	0.007	ND (<0.020)

Indoor Air Quality Measurements Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts September 29, 2022							
Test #	**Location**	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
006	Probate Courtroom #3	68.7	46.8	459	ND (<3)	0.001	ND (<0.020)
007	Clerk of the Superior Court Criminal	69.4	41.8	544	ND (<3)	0.007	ND (<0.020)
008	305 – Lunchroom, Clerk of Superior Court Civil	69.9	46.9	507	ND (<3)	0.006	ND (<0.020)
009	367 – Office	70.0	47.3	464	ND (<3)	0.004	ND (<0.020)
010	377 – Office	71.7	45.6	495	ND (<3)	0.015	ND (<0.020)
011	320A – Judges Lobby	71.0	45.2	525	ND (<3)	0.007	ND (<0.020)
012	SC1B – Superior Courtroom #1 Conference Room B	70.0	45.1	513	ND (<3)	0.009	ND (<0.020)
013	265A – Mediation	69.3	46.4	457	ND (<3)	0.003	ND (<0.020)
014	Superior Courtroom #7	68.5	48.1	563	ND (<3)	0.002	ND (<0.020)
015	248 – Jury Room	69.8	49.1	586	ND (<3)	0.005	ND (<0.020)
016	252 – Office	70.4	46.7	531	ND (<3)	0.004	ND (<0.020)
017	251A – Office	70.1	47.3	543	ND (<3)	0.005	ND (<0.020)
018	251 – Office	69.8	47.1	529	ND (<3)	0.004	ND (<0.020)

Indoor Air Quality Measurements Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts September 29, 2022							
Test #	**Location**	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
019	223A – DNA Lab Testing Room	71.1	46.6	544	ND (<3)	0.005	ND (<0.020)
020	223 – File Room	72.0	45.6	535	ND (<3)	0.005	ND (<0.020)
021	G04 – File Room	72.5	46.1	550	ND (<3)	0.004	ND (<0.020)
022	G05 – File Room	71.8	46.5	548	ND (<3)	0.005	ND (<0.020)
023	G03 – File Room	71.3	46.9	531	ND (<3)	0.003	ND (<0.020)
024	135 – Office	68.7	44.5	434	ND (<3)	0.010	ND (<0.020)
025	138 – Lawyers Office	69.0	44.7	443	ND (<3)	0.005	ND (<0.020)
026	Room Between 138 & Offices Beyond	68.7	45.6	435	ND (<3)	0.007	ND (<0.020)
027	138A – District Attorneys	67.7	46.6	452	ND (<3)	0.005	ND (<0.020)
028	134 – File Cabinets/ IT Storage	67.6	47.3	439	ND (<3)	0.005	ND (<0.020)
029	114A – District Attorneys	67.5	46.7	428	ND (<3)	0.007	ND (<0.020)
030	114 – Office	67.7	46.5	449	ND (<3)	0.007	ND (<0.020)
031	119 – Office	67.7	46.3	426	ND (<3)	0.008	ND (<0.020)

Indoor Air Quality Measurements Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts September 29, 2022							
Test #	**Location**	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
032	120 - Office	67.5	45.5	429	ND (<3)	0.015	ND (<0.020)
033	Outdoor – North Entrance 50 State Street	62.6	47.7	387	ND (<3)	0.008	ND (<0.020)
Springfield Housing & Juvenile Courthouse, 80 State Street, Springfield, MA							
034	Outdoors - Front 80 State Street	62.4	51.0	410	ND (<3)	0.012	ND (<0.020)
035	B09 – Mechanical Room	67.5	44.2	539	ND (<3)	0.016	ND (<0.020)
036	B17 – Mechanical Room	66.8	47.5	511	ND (<3)	0.009	ND (<0.020)
037	B14 – District Attorneys	68.6	51.4	552	ND (<3)	0.006	ND (<0.020)
038	B59 – Storage	70.5	49.8	633	ND (<3)	0.007	ND (<0.020)
039	58 – Storage/ Files	71.4	47.8	623	ND (<3)	0.005	ND (<0.020)
040	B39, Outside B42	71.5	48.8	719	ND (<3)	0.006	ND (<0.020)
041	B30 – Conference Room	71.2	46.5	569	ND (<3)	0.005	ND (<0.020)
042	329 – Hall to Stairs	72.4	43.4	535	ND (<3)	0.008	ND (<0.020)
043	347 – Office	71.3	43.2	527	ND (<3)	0.008	ND (<0.020)
044	348 – Stairwell #3	71.4	42.9	519	ND (<3)	0.008	ND (<0.020)

Indoor Air Quality Measurements Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts September 29, 2022							
Test #	**Location**	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
045	330 – Waiting/ Common Area	71.8	42.5	507	ND (<3)	0.008	ND (<0.020)
046	236 – Stair #2	72.4	42.3	496	ND (<3)	0.007	ND (<0.020)
047	246 – Office	72.2	41.5	501	ND (<3)	0.009	ND (<0.020)
048	254 – Office	72.5	42.6	576	ND (<3)	0.005	ND (<0.020)
049	229 - Stairwell #4	72.2	44.3	618	ND (<3)	0.007	ND (<0.020)
050	215 – Conference Room B	72.3	42.5	660	ND (<3)	0.005	ND (<0.020)
051	206 – Entryway/ Waiting for 201 Housing Ct #2	71.9	40.5	500	ND (<3)	0.006	ND (<0.020)
052	322 – Chief Housing Specialist	71.9	41.4	487	ND (<3)	0.011	ND (<0.020)
053	318 – Hallway	71.8	41.3	519	ND (<3)	0.005	ND (<0.020)
054	316 – File Storage	71.7	42.2	490	ND (<3)	0.008	ND (<0.020)
055	104 – Waiting Area	71.0	40.1	725	ND (<3)	0.007	ND (<0.020)
056	128 – Cubicle in 126	71.8	45.0	644	ND (<3)	0.005	ND (<0.020)
057	144 – Clerk Magistrates Office	72.1	45.0	604	ND (<3)	0.014	ND (<0.020)

Indoor Air Quality Measurements
Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts
September 29, 2022

Test #	Location	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
058	138 – Clerk Magistrates Office	72.2	45.4	656	ND (<3)	0.012	ND (<0.020)
059	125 – Waiting Area	72.6	44.4	625	ND (<3)	0.008	ND (<0.020)
060	148 – Womens Room	72.7	44.4	623	ND (<3)	0.010	ND (<0.020)
061	151C – Attorneys Room	73.1	46.2	640	ND (<3)	0.007	ND (<0.020)
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 or slightly below 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 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 of 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 426 to 719 ppm and outdoor concentrations ranged from 387 to 410 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). All CO_2 measurements in the Roderick L. Ireland Courthouse were also below the more stringent MA DPH guideline of 800 ppm. 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 were non-detect (<0.020 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 0.003 mg/m^3 to 0.016 mg/m^3 and were below the guideline of 0.150 mg/m^3. No corrective measures are indicated 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 September 29, 2022				
Sample Number	**Location**	**Sample Type**	**Mold Detected (spores/m³)**	**Interpretation**
Roderick L. Ireland Courthouse, 50 State Street, Springfield, MA				
34921792	Registry of Probate	Air	13	See Comment 1
34921784	Probate Courtroom #4	Air	40	See Comment 1
34921785	Clerk of Superior Court Criminal	Air	26	See Comment 1
34921788	367 - Office	Air	13	See Comment 1
34921797	Superior Courtroom #7	Air	27	See Comment 1
34921789	251 - Office	Air	13	See Comment 1
34921796	223A - DNA Lab Testing	Air	40	See Comment 1
34921786	G05 - File Room	Air	13	See Comment 1
3492180	138 - Lawyers Office	Air	13	See Comment 1
34921798	114A - District Attorneys		26	See Comment 1
34921803	Outdoors Front 50 State Street	Air	1,973	-----
Springfield Housing & Juvenile Courthouse, 80 State Street, Springfield, MA				
34921913	Outdoors, Front 80 State Street	Air	2,600	-----
34921793	B09 - Mechanical Room	Air	13	See Comment 1
34921794	B59 - Storage	Air	27	See Comment 1
34921819	348 - Stair #3	Air	40	See Comment 1
34921791	236 - Stairs 32	Air	13	See Comment 1
3 4921802	206 - Outside Housing Court #2	Air	26	See Comment 1
34926681	322 - Chief Housing Specialist	Air	13	See Comment 1
34921804	128 - Cubicle Area in 126	Air	26	See Comment 1
34921808	138 – Office in Clerk Magistrates	Air	13	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 mold 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 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. 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

Denise Houseman

Denise Houseman
Industrial Hygienist

Robert King

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

#22039346

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: **September 29, 2022**
Received: **October 5, 2022**
Reported: **October 5, 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 October 5th, 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

#22039346

Spore Trap
SOP - HMC#101

Sample Number	1	34921792		2	34921784		3	34921785		4	34921788	
Sample Name	**Registry of Probate**			**Probate Courtroom #4**			**Clerk of Superior Court Criminal**			**367 - Office**		
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	1	13	100.0%	2	27	66.7%	1	13	50.0%	1	13	100.0%
Aspergillus|Penicillium												
Basidiospores				1	13	33.3%						
Bipolaris|Drechslera							1	13	50.0%			
Chaetomium												
Cladosporium												
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes												
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	1	13	100%	3	40	100%	2	26	100%	1	13	100%

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

Collected: **Sep 29, 2022** Received: **Oct 5, 2022** Reported: **Oct 5, 2022**

Project Analyst: Ramesh Poluri, PhD P. Ramesh Date: **10 - 05 - 2022**

Reviewed By: Steve Hayes, BSMT Stephen N. Hayes Date: **10 - 05 - 2022**

HAYES MICROBIAL CONSULTING
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499949
Springfield District Court
50 & 80 State Street
Springfield, MA

#22039346

Spore Trap
SOP - HMC#101

Sample Number	5	34921797		6	34921789		7	34921796		8	34921786	
Sample Name	**Superior Courtroom #7**			**251 - Office**			**223A - DNA Lab Testing**			**G05 - File 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			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	100.0%	1	13	100.0%	2	27	66.7%	1	13	100.0%
Aspergillus|Penicillium												
Basidiospores												
Bipolaris|Drechslera												
Chaetomium												
Cladosporium							1	13	33.3%			
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes												
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	2	27	100%	1	13	100%	3	40	100%	1	13	100%

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

Collected: **Sep 29, 2022** Received: **Oct 5, 2022** Reported: **Oct 5, 2022**

Project Analyst: Ramesh Poluri, PhD P. Ramesh Date: **10 - 05 - 2022**

Reviewed By: Steve Hayes, BSMT Stephen N. Hayes Date: **10 - 05 - 2022**

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Springfield, MA

#22039346

Spore Trap
SOP - HMC#101

Sample Number	9	3492180		10	34921798		11	34921803		12	34921913	
Sample Name	**138 - Lawyers Office**			**114A - District Attorneys**			**Outdoors - Front 50 State St**			**Outdoors - Front 80 State St**		
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							1	13	<1%	1	13	<1%
Ascospores	1	13	100.0%	1	13	50.0%	96	1280	64.9%	128	1707	65.6%
Aspergillus|Penicillium												
Basidiospores							44	587	29.7%	52	693	26.7%
Bipolaris|Drechslera												
Chaetomium												
Cladosporium							3	40	2.0%	8	107	4.1%
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes							4	53	2.7%	6	80	3.1%
Pithomyces												
Stachybotrys												
Stemphylium												
Torula				1	13	50.0%						
Ulocladium												
Total	1	13	100%	2	26	100%	148	1973	100%	195	2600	100%

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

Collected: **Sep 29, 2022** Received: **Oct 5, 2022** Reported: **Oct 5, 2022**

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Spore Trap
SOP - HMC#101

Sample Number	13	34921793		14	34921794		15	34921819		16	34921791	
Sample Name	**B09 - Mechanical Room**			**B59 - Storage**			**348 - Stair #3**			**236 - Stairs 32**		
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	1	13	100.0%	2	27	100.0%	2	27	66.7%	1	13	100.0%
Aspergillus|Penicillium												
Basidiospores							1	13	33.3%			
Bipolaris|Drechslera												
Chaetomium												
Cladosporium												
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes												
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	1	13	100%	2	27	100%	3	40	100%	1	13	100%

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

Collected: **Sep 29, 2022** Received: **Oct 5, 2022** Reported: **Oct 5, 2022**

Project Analyst: Ramesh Poluri, PhD P. Ramesh Date: **10 - 05 - 2022**

Reviewed By: Steve Hayes, BSMT Stephen N. Hayes Date: **10 - 05 - 2022**

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Spore Trap
SOP - HMC#101

Sample Number	17	34921802		18	34926681		19	34921804		20	34921808	
Sample Name	206 - Outside Housing Court #2			322 - Chief Housing Specialist			128 - Cubicle Area in 126			138 - Office in Clerk Majesties Office		
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			13/m^3		
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	50.0%				1	13	50.0%	1	13	100.0%
Aspergillus|Penicillium												
Basidiospores	1	13	50.0%	1	13	100.0%						
Bipolaris|Drechslera												
Chaetomium												
Cladosporium												
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes							1	13	50.0%			
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	2	26	100%	1	13	100%	2	26	100%	1	13	100%

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

Collected: **Sep 29, 2022** Received: **Oct 5, 2022** Reported: **Oct 5, 2022**

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Project Analyst: Ramesh Poluri, PhD P. Ramesh Date: **10 - 05 - 2022**

Reviewed By: Steve Hayes, BSMT Stephen N. Hayes Date: **10 - 05 - 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.

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.

Bipolaris|Drechslera

Habitat: They are found in soil and as plant pathogens. Can grow indoors on a variety of substrates.

Effects: They may be allergenic and are very commonly involved in allergic fungal sinusitis. They are opportunistic pathogens but occasionally infect healthy individuals, causing keratitis, sinusitis and osteomyelitis.

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.

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

Torula

Habitat: Found in soil and on wood and grasses. Occasionally found growing indoors on cellulose containing materials.

Effects: A known allergen. No known cases of human infection.

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DATE: 10-05-2022

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MOLD
22039346

Job Number: 499949
Or: ~~Olivia Smaracko~~ Denise Houseman
Date Collected: 9/29/22

Job Name: Springfield District Court
50 & 80 State Street
Springfield, MA

Phone: (781) 789-2985
Email: ~~osmaracko@trccompanies.co~~
Note: dhouseman@trccompanies.com

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	34921792	Registry of Probate	S	75 L	
2	34921784	Probate Courtroom #4	S	75 L	
3	34921785	Clerk of Superior Court Criminal	S	75 L	
4	34921788	367- Office	S	75 L	
5	34921797	Superior Courtroom #7	S	75 L	
6	34921789	251- Office	S	75 L	
7	34921796	223A- DNA Lab Testing	S	75 L	
8	34921786	G05- File Room	S	75 L	
9	34921805	138- Lawyers Office	S	75 L	
10	34921798	114A- District Attorneys	S	75 L	
11	34924803	Outdoors- Front 50 State St	S	75 L	
12	34921913	Outdoors- Front 80 State St	S	75 L	
13	34921793	B09- Mechanical Room	S	75 L	
14	34921794	B59- Storage	S	75 L	
15	34921819	348- Stair #3	S	75 L	
16	34921791	236- Stair #2	S	75 L	

AOC

Released by: [signature] Date: 9/29/22
Received By: E.O Date: 10/5

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814 Broad Street
Weymouth, MA 02189

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SHIP: FEDEX - BOX SO
DATE: 10-05-2022

8123 4351 7863

MOLD
22039346

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:	Note:

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	~~206~~ Sample	Analysis	Volume	Notes
AOC 1	~~17~~ 34921802	206 - Outside Housing Court #2	S	75 L	
	~~18~~ 34926681	322 - Chief Housing Specialist	S	75 L	
	~~19~~ 34921804	128 - Cubicle Area in 126	S	75 L	
	~~20~~ 34921808	138 - Office in Clerk Magistrates Office	S	75 L	
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Released by:	Date:	Received By: E.O	Date: 10/5