300 Wildwood Ave., Suite 230
Woburn, MA 01801
T 781.933.2555
TRCcompanies.com

November 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 16
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 October 20, 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
October 20, 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	440 – Vault	71.0	31.3	510	ND (<3)	ND (<0.000)	0.085
002	420 – Office	70.9	24.1	536	ND (<3)	0.001	0.204
003	Stairwell #2 – 4th Floor	69.8	31.4	508	ND (<3)	0.001	0.184
004	Probate Courtroom #1	71.3	28.0	550	ND (<3)	0.012	0.139
005	400 – Registry of Probate, Behind Counter	71.3	24.1	538	ND (<3)	0.002	ND (<0.020)

Indoor Air Quality Measurements
Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts
October 20, 2022

Test #	Location	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
006	408A – In Registry of Deeds	71.0	23.9	532	ND (<3)	0.004	ND (<0.020)
007	362 – Office in District Attorney	73.7	35.2	606	ND (<3)	0.002	ND (<0.020)
008	320B – Judges Lobby	72.8	34.6	600	ND (<3)	0.005	ND (<0.020)
009	Superior Courtroom #4	71.9	36.7	515	ND (<3)	0.002	ND (<0.020)
010	314 – Jury Room B	71.0	37.8	604	ND (<3)	0.003	ND (<0.020)
011	310 – Breakroom, Law Library	74.7	39.6	614	ND (<3)	ND (<0.000)	ND (<0.020)
012	344 – Office	75.0	36.1	694	ND (<3)	0.005	0.027
013	246 - Judges Lobby	75.1	35.5	669	ND (<3)	0.008	ND (<0.020)
014	District Courtroom #9	75.5	34.4	725	ND (<3)	0.007	ND (<0.020)
015	244 – Cubicles in Interpreters Office	73.6	35.6	707	ND (<3)	0.005	ND (<0.020)
016	204B– Judges Lobby	70.8	38.3	618	ND (<3)	0.00	0.070
017	204– Judges Lobby	70.1	39.7	630	ND (<3)	0.006	0.057
018	204A– Judges Lobby	70.3	38.7	578	ND (<3)	0.002	ND (<0.020)

Indoor Air Quality Measurements Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts October 20, 2022							
Test #	**Location**	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
019	204A – Conference Room	72.3	37.7	731	ND (<3)	0.019	ND (<0.020)
020	138B – Bar Association	74.0	35.8	701	ND (<3)	0.008	ND (<0.020)
021	153 – Office in District Court of Probate	74.1	35.3	748	ND (<3)	0.009	ND (<0.020)
022	110B – Clerk of District Court Civil	74.6	35.1	721	ND (<3)	0.008	ND (<0.020)
023	109 – Copy Room	74.8	35.1	707	ND (<3)	0.002	ND (<0.020)
024	100 – Parking Tickets/ Cashier	73.1	37.1	708	ND (<3)	0.006	ND (<0.020)
025	G40 – File Room	73.5	37.5	638	ND (<3)	0.002	ND (<0.020)
026	G27D – Mailroom Lunchroom	72.7	35.1	643	ND (<3)	0.002	ND (<0.020)
027	G02 – Janitors Storage Room	70.2	35.9	612	ND (<3)	0.003	ND (<0.020)
028	Hallway Between G31 & G55	72.9	35.1	640	ND (<3)	0.002	ND (<0.020)
029	G49 – In Mechanical Room	72.5	32.7	576	ND (<3)	0.081	ND (<0.020)
030	G35 – Security Check-in Office	72.5	33.7	663	ND (<3)	0.007	ND (<0.020)
031	Outdoor – Front Entrance 50 State Street	55.6	37.7	465	ND (<3)	0.013	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 October 20, 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	55.2	41.1	432	ND (<3)	0.015	ND (<0.020)
033	306 – Janitors Closet	67.6	46.1	611	ND (<3)	0.009	ND (<0.020)
034	307 – Lunch Room	74.4	36.4	595	ND (<3)	0.006	ND (<0.020)
035	305 – Cubicles/ Office	72.1	32.0	571	ND (<3)	0.004	ND (<0.020)
036	202 – Judges Lobby	71.0	31.0	464	ND (<3)	0.004	ND (<0.020)
037	210 – Stairwell #5	71.6	34.4	677	ND (<3)	0.004	ND (<0.020)
038	216 – Judges Lobby	72.4	30.8	505	ND (<3)	0.011	ND (<0.020)
039	249 – Office in Probation	72.0	33.9	695	ND (<3)	0.004	ND (<0.020)
040	247 – Office in Probation	70.8	32.8	506	ND (<3)	0.003	ND (<0.020)
041	240 – Judicial Department	70.9	32.0	573	ND (<3)	0.004	ND (<0.020)
042	222 – Juvenile Court #1	70.3	25.3	441	ND (<3)	0.004	ND (<0.020)
043	340 – Hall Outside Judges Lobbies	71.0	31.0	533	ND (<3)	0.013	ND (<0.020)
044	339 – Copy Room	71.0	31.9	492	ND (<3)	0.009	ND (<0.020)

Indoor Air Quality Measurements Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts October 20, 2022							
Test #	**Location**	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
045	B15 – File Room	72.3	28.4	479	ND (<3)	0.004	ND (<0.020)
046	325 - Office	72.5	31.3	519	ND (<3)	0.004	ND (<0.020)
047	132 – Clerk Magistrates Office	72.9	34.1	630	ND (<3)	0.004	ND (<0.020)
048	123 – Waiting Area	73.1	33.6	623	ND (<3)	0.005	ND (<0.020)
049	126 - Cubicles	73.3	33.3	663	ND (<3)	0.004	ND (<0.020)
050	106 – Waiting Area	73.3	32.0	775	ND (<3)	0.012	0.043
051	114 – Womens Room	71.5	29.9	639	ND (<3)	0.009	ND (<0.020)
052	150 – Waiting Area	71.9	35.6	659	ND (<3)	0.003	ND (<0.020)
053	149 – Stairwell #2	72.1	31.0	518	ND (<3)	0.004	ND (<0.020)
054	B74 – Lock-up	72.6	33.2	570	ND (<3)	0.002	ND (<0.020)
055	B48 – Waiting Area Outside Elevator	72.2	31.2	518	ND (<3)	0.004	ND (<0.020)
056	B13 – Cubicle Area	71.4	31.5	515	ND (<3)	0.003	ND (<0.020)
057	B23 - Office	70.7	32.4	520	ND (<3)	0.008	ND (<0.020)

Indoor Air Quality Measurements
Springfield Court Complex, 50 & 80 State Street, Springfield, Massachusetts
October 20, 2022

Test #	Location	Temp (°F)	Relative Humidity (%)	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Airborne PM_{10} (mg/m^3)	Volatile Organic Compounds (ppm)
058	B30 – Conference Room	70.8	35.1	541	ND (<3)	0.007	ND (<0.020)
059	B34 - Office	70.9	34.9	590	ND (<3)	0.010	ND (<0.020)
060	B15 – Files/ Janitor Storage	70.3	32.1	461	ND (<3)	0.005	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 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%. 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 is not necessary on drier days or days when temperatures are relatively low.

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 441 to 775 ppm and outdoor concentrations ranged from 432 to 465 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 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 0.204 ppm. While almost all VOC measurements were below the desired comfort range and occupational exposure limits for common VOCs, there were two excursions of 0.204 ppm in 420 – Office and 0.184 ppm in Stairwell #2 – 4th Floor. 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 ND (<0.001 mg/m^3) to 0.081 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 October 20, 2022				
Sample Number	**Location**	**Sample Type**	**Mold Detected (spores/m³)**	**Interpretation**
Roderick L. Ireland Courthouse, 50 State Street, Springfield, MA				
34921134	440 - Vault	Air	27	See Comment 1
34921138	Probate Courtroom #1	Air	13	See Comment 1
34921195	320 - Judges Lobby	Air	26	See Comment 1
34921136	344 - Office	Air	26	See Comment 1
34921133	246 - Judges Lobby	Air	26	See Comment 1
34921266	204 B - Judges Lobby	Air	13	See Comment 1
34921257	204 - Judges Lobby	Air	27	See Comment 1
34921264	204 A - Judges Lobby	Air	13	See Comment 1
34921179	138 B - Bar Association	Air	40	See Comment 1
34921146	110 B - Clerk of District Court Civil	Air	13	See Comment 1
34921189	G35 - Security Check in Office	Air	26	See Comment 1
34921156	Outdoors Front 50 State Street	Air	599	-----
Springfield Housing & Juvenile Courthouse, 80 State Street, Springfield, MA				
34921160	Outdoors, Front 80 State Street	Air	760	-----
34921194	307 Lunchroom	Air	13	See Comment 1
34921197	202 - Judges Lobby	Air	26	See Comment 1
34921224	249 - Office in Probation	Air	13	See Comment 1
34921147	340 - Outside Judges Lobbies	Air	40	See Comment 1
34921176	106 - Waiting Area	Air	39	See Comment 1
34921218	149 - Stairwell #2	Air	13	See Comment 1
34921234	B48 - Outside Elevator	Air	27	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

#22043065

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: **October 20, 2022**
Received: **October 27, 2022**
Reported: **October 27, 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 27th, 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

Denise Houseman
TRC Companies
814 Broad Street
Weymouth, MA 02189
(781) 337-0016

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

#22043065

Spore Trap
SOP - HMC#101

Sample Number	1	34921134		2	34921138		3	34921195		4	34921136	
Sample Name	**440 - Vault**			**Probate Courtroom #1**			**320 - Judges Lobby**			**344 - 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	13/m³			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%	1	13	100.0%	1	13	50.0%	1	13	50.0%
Aspergillus|Penicillium												
Basidiospores										1	13	50.0%
Bipolaris|Drechslera												
Chaetomium												
Cladosporium												
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes							1	13	50.0%			
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	2	27	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: **Oct 20, 2022** Received: **Oct 27, 2022** Reported: **Oct 27, 2022**

HAYES MICROBIAL CONSULTING

Project Analyst: Ramesh Poluri, PhD P. Ramesh Date: **10 - 27 - 2022**

Reviewed By: Steve Hayes, BSMT Stephen N. Hayes Date: **10 - 27 - 2022**

Denise Houseman
TRC Companies
814 Broad Street
Weymouth, MA 02189
(781) 337-0016

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

#22043065

Spore Trap
SOP - HMC#101

Sample Number	5	34921133		6	34921266		7	34921257		8	34921264	
Sample Name	**246 - Judges Lobby**			**204 B - Judges Lobby**			**204 - Judges Lobby**			**204 A - Judges Lobby**		
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	50.0%	1	13	100.0%	2	27	100.0%	1	13	100.0%
Aspergillus|Penicillium												
Basidiospores												
Bipolaris|Drechslera												
Chaetomium												
Cladosporium	1	13	50.0%									
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes												
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	2	26	100%	1	13	100%	2	27	100%	1	13	100%

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

Collected: **Oct 20, 2022** Received: **Oct 27, 2022** Reported: **Oct 27, 2022**

Project Analyst: Ramesh Poluri, PhD P. Ramesh Date: **10 - 27 - 2022**

Reviewed By: Steve Hayes, BSMT Stephen N. Hayes Date: **10 - 27 - 2022**

HAYES MICROBIAL CONSULTING
3005 East Boundary Terrace, Suite F. Midlothian, VA. 23112 (804) 562-3435 contact@hayesmicrobial.com

Denise Houseman
TRC Companies
814 Broad Street
Weymouth, MA 02189
(781) 337-0016

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

#22043065

Spore Trap
SOP - HMC#101

Sample Number	9	34921179		10	34921146		11	34921189		12	34921156	
Sample Name	138 B - Bar Association			110 B - Clerk Of District Court Civil			G35 - Security Check In Office			Outdoors Front 50 State St.		
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										1	13	2.2%
Ascospores	2	27	66.7%	1	13	100.0%	1	13	50.0%	18	240	40.0%
Aspergillus|Penicillium												
Basidiospores							1	13	50.0%	7	93	15.6%
Bipolaris|Drechslera												
Chaetomium												
Cladosporium										15	200	33.3%
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes	1	13	33.3%							4	53	8.9%
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	3	40	100%	1	13	100%	2	26	100%	45	599	100%

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

Collected: **Oct 20, 2022** Received: **Oct 27, 2022** Reported: **Oct 27, 2022**

HAYES MICROBIAL CONSULTING

Project Analyst: Ramesh Poluri, PhD P. Ramesh Date: **10 - 27 - 2022**

Reviewed By: Steve Hayes, BSMT Stephen N. Hayes Date: **10 - 27 - 2022**

3005 East Boundary Terrace, Suite F. Midlothian, VA. 23112 (804) 562-3435 contact@hayesmicrobial.com

Denise Houseman
TRC Companies
814 Broad Street
Weymouth, MA 02189
(781) 337-0016

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

#22043065

Spore Trap
SOP - HMC#101

Sample Number	13	34921160		14	34921194		15	34921197		16	34921224	
Sample Name	**Outdoors Front 80 State St.**			**307 Lunch Room**			**202 - Judges Lobby**			**249 - Office In Probation**		
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	30	400	52.6%	1	13	100.0%	1	13	50.0%			
Aspergillus|Penicillium												
Basidiospores	14	187	24.6%							1	13	100.0%
Bipolaris|Drechslera												
Chaetomium												
Cladosporium	12	160	21.1%				1	13	50.0%			
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes	1	13	1.8%									
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	57	760	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: **Oct 20, 2022** Received: **Oct 27, 2022** Reported: **Oct 27, 2022**

HAYES MICROBIAL CONSULTING

Project Analyst: Ramesh Poluri, PhD P. Ramesh Date: **10 - 27 - 2022**

Reviewed By: Steve Hayes, BSMT Stephen N. Hayes Date: **10 - 27 - 2022**

3005 East Boundary Terrace, Suite F. Midlothian, VA. 23112 (804) 562-3435 contact@hayesmicrobial.com

Denise Houseman
TRC Companies
814 Broad Street
Weymouth, MA 02189
(781) 337-0016

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

#22043065

Spore Trap
SOP - HMC#101

Sample Number	17	34921147		18	34921176		19	34921218		20	34921234	
Sample Name	**340 - Outside Judges Lobbies**			**106 - Waiting Area**			**149 - Stairwell #2**			**B48 - Outside Elevator**		
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				1	13	33.3%						
Ascospores	2	27	66.7%	1	13	33.3%	1	13	100.0%	2	27	100.0%
Aspergillus|Penicillium												
Basidiospores	1	13	33.3%									
Bipolaris|Drechslera												
Chaetomium												
Cladosporium												
Curvularia												
Epicoccum												
Fusarium												
Memnoniella												
Myxomycetes				1	13	33.3%						
Pithomyces												
Stachybotrys												
Stemphylium												
Torula												
Ulocladium												
Total	3	40	100%	3	39	100%	1	13	100%	2	27	100%

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

Collected: **Oct 20, 2022** Received: **Oct 27, 2022** Reported: **Oct 27, 2022**

Project Analyst: Ramesh Poluri, PhD P. Ramesh Date: **10 - 27 - 2022**

Reviewed By: Steve Hayes, BSMT Stephen N. Hayes Date: **10 - 27 - 2022**

HAYES MICROBIAL CONSULTING
3005 East Boundary Terrace, Suite F. Midlothian, VA. 23112 (804) 562-3435 contact@hayesmicrobial.com

Denise Houseman
TRC Companies
814 Broad Street
Weymouth, MA 02189
(781) 337-0016

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

#22043065

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.

Denise Houseman
TRC Companies
814 Broad Street
Weymouth, MA 02189
(781) 337-0016

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

#22043065

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.

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.

HAYES MICROBIAL CONSULTING

TRC Companies
814 Broad Street
Weymouth, MA 02189

N

SHIP: FEDEX - BOX SO
DATE: 10-27-2022

8123 4351 7841

MOLD
22043065

Job Number: 499949	Job Name: Springfield District Court 50 & 80 State Street Springfield, MA
or: ~~Olivia Smaracko~~ Denise Hasemen	e: (781) 789-2985 Email: osmaracko@trccompanies.co
Date Collected: 10/20/2022	Note: dhasemen@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	34921134	440-Vault	S	75 L	
2	34921138	Probate Courtroom #1	S	75 L	
3	34921195	320-Judges Lobby	S	75 L	
4	34921136	344-Office	S	75 L	
5	34921133	246-Judges Lobby	S	75 L	
6	34921266	204B-Judges Lobby	S	75 L	
7	34921257	204-Judges Lobby	S	75 L	
8	34921264	204A-Judges Lobby	S	75 L	
9	34921179	138B-Bar Association	S	75 L	
10	34921146	110B-Clerk of District Court Civil	S	75 L	
11	34921189	G35-Security Check-In Office	S	75 L	
12	34921156	Outdoors Front 50 State St	S	75 L	
13	34921160	Outdoors Front 80 State St	S	75 L	
14	34921194	307-Lunch Room	S	75 L	
15	34921197	202-Judges Lobby	S	75 L	
16	34921224	249-Office in Probation	S	75 L	

Released by:	Date: 10/20/2022	Received By:	Date: 10/27

HAYES MICROBIAL CONSULTING

TRC Companies
814 Broad Street
Weymouth, MA 02189

N

SHIP: FEDEX - BOX SO
DATE: 10-27-2022

8123 4351 7841

MOLD
22043065

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	Sample	Analysis	Volume	Notes
1	34921147	340- Outside Judges Lobbies	S	75 L	
2	34921176	106- Waiting Area	S	75 L	
3	34921218	149- Stairwell #2	S	75 L	
4	34921234	B48- Outside ~~Elevator~~	S	75 L	
5					
6					
7					
8					
9					
10					
11					
12					
13					
14					
15					
16					

Released by:	Date:	Received By: E.O	Date: 10/27