### Environmental Health & Engineering, Inc.



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April 15, 2022

Mr. Charles A. O'Brien
Director
Facilities Management & Capital Planning
Massachusetts Trial Courts
Three Pemberton Square
Boston, MA 02108

RE: Indoor Air Quality Assessment, Roderick L. Ireland Courthouse, Springfield, Massachusetts (EH&E 22799.2)

Dear Mr. O'Brien:

Environmental Health & Engineering, Inc. (EH&E) presents this letter to the Massachusetts Trial Court regarding the findings from our assessment of Roderick L. Ireland Courthouse (the Building) located at 50 State Street, Springfield, Massachusetts. This assessment was requested by the Massachusetts Trial Court in response to concerns expressed by some occupants of the Building about the presence of potential mold growth in the Building that may be affecting indoor air quality.

Sampling for airborne mold spores in April 2022 did not indicate that sources of mold were impacting the indoor air in most locations of the Building. As described in the following sections, EH&E's observations and testing indicate that remediation efforts, upgraded building filtration, and use of portable air cleaning units have been effective in addressing the moldimpacted materials identified in the Building.

### **SUMMARY**

EH&E collected air samples for analysis of total (viable and non-viable) mold spores in 46 locations throughout each floor of the Building in April 2022. The sampling locations selected were the same locations that were sampled by EH&E in August 2019. Results of the April 2022 air sampling in the Building indicate:

• Total airborne mold spore concentrations decreased in the Building. The average concentration of 144 spores per cubic meter of air (spores/m³) measured in April 2022 is lower than the average concentration of 504 spores/m³ measured in August 2019. In addition, the median total airborne mold spore concentration of 110 spores/m³ measured in April 2022 is lower than the median concentration of 339 spores/m³ measured in August 2019.

- Total indoor mold spore concentrations remain below total outdoor mold spore concentrations. Average total airborne mold spore concentrations in the outdoor air measured at the outdoor air intakes of the Building were 50,800 spore/m³ in August 2019 and 4,600 spores/m³ in April 2022.
- Total indoor mold spore concentrations decreased in most locations tested. 80% of the 46 sampling locations indicated lower concentrations of total mold spores when compared to results of the August 2019 sampling.
- Remediation work was effective in Superior Courtroom 1 and sampling results do not
  indicate mold sources impacting the air in this room. Air sampling results from Superior
  Courtroom 1 collected in August 2019 suggested the presence of potential indoor mold
  sources affecting the air in this room. April 2022 sample results indicate significantly lower
  spore concentrations.
- April 2022 airborne mold spore sampling results in the Building did not suggest the presence of indoor mold sources affecting indoor air quality (IAQ) in any location, except room G27C.
- Air sampling results from room G27C collected in April 2022 suggested the presence of potential indoor mold sources affecting the air in this room. The concentrations of *Penicillium/Aspergillus* spores in this room were elevated compared with those detected in other areas of the Building, outdoors, and those expected in typical indoor environments. EH&E recommends appropriately remediating water damage and mold growth in this area.
- Visual inspection conducted in April of 2022 indicates that 138 of the 167 locations with moisture/mold issues identified by EH&E in 2019 have been addressed or are in the process of being addressed.

#### AIRBORNE MOLD SPORES

EH&E collected air samples for analysis of total (viable and non-viable) mold spores in multiple locations on each floor of the Building in August 2019 and in the same locations in April 2022. For comparison purposes, air samples were also collected outdoors. Replicate and blank samples were collected for quality control purposes. Airborne fungal spore data reflect the total number of spores present in the air, not just those that are viable. This sampling method was chosen because both viable and non-viable mold spores may produce allergic reactions in individuals who are sensitive to them. Air sampling results are presented in Tables A.1 and A.2 in Appendix A.

Although no regulatory standards exist for indoor levels of airborne mold spores, comparisons between indoor and outdoor spore types and levels can indicate whether the indoor environment may be supporting the selective growth of specific species. This type of comparison is designed

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<sup>&</sup>lt;sup>1</sup> AIHA. 2005. Field Guide for Determination of Biological Contaminants in Environmental Samples, 2<sup>nd</sup> Edition. Hung LL, Miller JD, Dillon HK, eds. Fairfax, VA: American Industrial Hygiene Association.

to aid in detection of fungal amplification (i.e., localized growth) in indoor reservoirs that may support growth due to the presence of excessive moisture and suitable nutrients. Indoor environments without significant mold growth will generally contain a variety of spore types, depending on a number of factors, and the outdoor and indoor profiles of mold spores are generally similar.<sup>2</sup> A predominance of spore types indoors, particularly those that are used as indicators of chronic moisture damage that do not correlate well with outdoor results, may indicate mold growth indoors.

August 2019 airborne mold spore sampling results in the Building did not suggest the presence of indoor mold sources affecting IAQ in any location, except Superior Courtroom 1 in the Building. Total mold spore concentrations and levels of individual spores at all locations indoors, except Superior Courtroom 1, were similar to or below outdoor concentrations. All spore types detected indoors are commonly found in outdoor air and, therefore, also often found indoors, and none are considered indicators of chronic wetness/mold damage conditions. Further, spore levels in all areas except Superior Courtroom 1 were within ranges normally seen in indoor environments without mold problems.<sup>3</sup>

Air sampling results from Superior Courtroom 1 collected in August 2019 suggested the presence of potential indoor mold sources affecting the air in this room. The concentration of *Penicillium/Aspergillus* spores in this courtroom were elevated compared with those detected in other areas of the Building, outdoors, and those expected in typical indoor environments. EH&E recommended appropriately remediating water damage and mold growth in this area (and all areas where mold growth was identified in the Building). Results of the April 2022 air sampling indicate that remediation efforts improved conditions in Superior Courtroom 1. The concentration of *Penicillium/Aspergillus* spores in this courtroom decreased from 1,580 spores/m³ to less than 13 spores/m³.

April 2022 airborne mold spore sampling results in the Building were significantly lower than the August 2019 results and did not suggest the presence of indoor mold sources affecting IAQ in any location, except room G27C. Total mold spore concentrations and levels of individual spores at all locations indoors, except G27C, were similar to or below outdoor concentrations. All spore types detected indoors are commonly found in outdoor air and, therefore, also often found indoors, and none are considered indicators of chronic wetness/mold damage conditions.

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<sup>&</sup>lt;sup>2</sup> ACGIH. 1999. *Bioaerosols: Assessment and Control*. Macher J, ed. Cincinnati, OH: American Conference of Governmental Industrial Hygienists.

MacIntosh DL, Brightman HS, Baker BJ, Myatt TA, Stewart JH, McCarthy JF. 2006. Airborne fungal spores in a cross-sectional study of office buildings. *Journal of Occupational and Environmental Hygiene*, 3:379-389; Baxter DM, Perkins JL, McGhee CR, Seltzer JM, 2005, A Regional Comparison of Mold Spore Concentrations Outdoors and Inside "Clean" and "Mold Contaminated" Southern California Buildings, *Journal of Occupational and Environmental Hygiene*, 2:8-18; Gots RE, Layton NJ, Pirages SW. 2003. Indoor Health: Background Levels of Fungi. *American Industrial Hygiene Association Journal*, 64:427-438.

Further, spore levels in all areas except G27C were within ranges normally seen in indoor environments without mold problems.

#### **VISUAL INSPECTION RESULTS**

EH&E's site assessment was conducted April 4-6, 2022 and included visually re-inspecting every location identified in July – September 2019 as a potential location with sources or conditions that could negatively impact IAQ, such as evidence of water damage (i.e., staining) and/or mold growth.

In 2019, EH&E identified water and mold-impacted materials in 167 various areas of the Building. In a few locations, impacted materials were wet, indicating active moisture sources and surface sampling results confirmed the presence of mold growth on some materials; the types of mold detected are commonly seen on moisture-impacted materials.<sup>4</sup> Although mold growth was present in many areas of the Building, airborne mold spore sampling results were generally low and did not suggest the presence of indoor mold sources affecting IAQ in most locations.

Table B.1 in Appendix B details the moisture/mold issues identified by EH&E in the Building and the results of re-inspection of the identified locations to determine if they had been addressed. In 2019 EH&E recommended investigating and correcting the underlying cause of the moisture issues identified. Where applicable, it was also recommended that mold growth be appropriately remediated. Specific recommended mold remediation procedures, which incorporate industry-standard mold remediation guidance were provided. Although the issues identified varied by location common items identified were:

- Water-stained ceiling tiles. These tiles were recommended to be removed and replaced. In most areas, no active leaks were identified. After ceiling tiles are replaced, the locations should be monitored for reoccurrence and moisture source(s) should be corrected, if warranted.
- Water staining and damage near windows and perimeter areas. Mold-impacted materials were recommended to be remediated. Water-impacted materials without mold growth were recommended to be repaired/repainted for aesthetic purposes. These areas should be monitored for leaks and, if necessary, leaks should be corrected.

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<sup>&</sup>lt;sup>4</sup> AIHA. 2008. *Recognition, Evaluation, and Control of Indoor Mold.* Prezant B, Weekes DM, Miller JD, eds. Fairfax, VA: American Industrial Hygiene Association.

<sup>&</sup>lt;sup>5</sup> EPA. 2008. *Mold Remediation in Schools and Commercial Buildings*. Washington, DC: U.S. Environmental Protection Agency Office of Air and Radiation, Indoor Environments Division. <a href="https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide">https://www.epa.gov/mold/mold-remediation-schools-and-commercial-buildings-guide</a>; NYDOH. 2008. Guidelines on Assessment and Remediation of Fungi in Indoor Environments. New York City Department of Health and Mental Hygiene, Bureau of Environmental & Occupational Disease Epidemiology. <a href="https://www1.nyc.gov/assets/doh/downloads/pdf/epi/epi-mold-guidelines.pdf">https://www1.nyc.gov/assets/doh/downloads/pdf/epi/epi-mold-guidelines.pdf</a>.

• Dust accumulation and mold growth on supply air diffusers/surrounding ceiling tiles. EH&E recommended cleaning supply diffusers and cleaning/replacing surrounding ceiling tiles. EH&E also recommended to review and establish an appropriate cleaning schedule for supply diffusers.

Based on conditions observed by EH&E in April 2022, 138 of the 167 locations with moisture/mold issues identified by EH&E in 2019 have been addressed or are in the process of being addressed. EH&E understands that renovation and repair activities are ongoing and that the additional areas are scheduled to be addressed.

#### **CONCLUSIONS AND RECOMMENDATIONS**

EH&E's observations and testing indicate that remediation efforts, upgraded building filtration, and use of portable air cleaning units have been effective in addressing the mold-impacted materials identified in the Building. EH&E recommends establishing an operations and maintenance plan (O&M Plan) to manage conditions related to mold and moisture in the Building until the scheduled major renovation activities are initiated in approximately two years. The purpose of the recommended O&M Plan should be to:

- Recognize, control, and mitigate potential mold growth in the Building.
- Ensure the continued health and safety of staff, visitors, contractors, vendors, and the community.
- Implement proactive cleaning and maintenance activities.
- Maintain air and surface concentrations of mold below guidelines agreed to by building occupants and building management.
- Ensure adequate ventilation and filtration are provided to the Building.
- Specify mold sampling schedules and plans.

If you have any comments or questions regarding this report, please contact me at 1-800-TALK EHE (1-800-825-5343).

Sincerely,

Matt A. Fragala, M.S., CIH, CSP Managing Principal Consultant

Appendix A Air Sample Results

Appendix B Visual Inspection Results

Appendix C Limitations

# APPENDIX A AIR SAMPLE RESULTS

**Table A.1** Air Sampling Results for Total Viable and Non-Viable Fungal (Mold) Spores, Roderick L. Ireland Courthouse, 50 State Street, Springfield, Massachusetts, August 6 – 8, 2019 and April 2022

		Sam	ple ID				ntration
Floor	Location	2019	April- 2022	Fungal Type	20	(spore	es/m³)* April-2022
G	G17	192066	210736	Ascospores & basidiospores (mix tiny, hyaline)	20	452	April-2022
		172000	210700	Basidiospores		102	110
				·	Total	452	110
G	G27C	192067	210658	Aspergillus/Penicillium		57	1000
				Ascospores & basidiospores (pigmented)		57	
				Ascospores & basidiospores (mix tiny, hyaline) Smuts/Periconia/myxomycetes		452	13
				Other hyaline Fungi		57	13
				a u.e. r.jae r arrigi	Total	622	1000
G	G37	192068	210659	Ascospores & basidiospores (mix tiny, hyaline)		339	
				Basidiospores			370
	0.40	1000/0	040707		Total	339	370
G	G43	192069	210737	Assessors & basidiscores (pigmonted)		57	53
				Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline)		113 1020	
				Ascospores  Ascospores		1020	53
				Basidiospores			110
				Smuts/ <i>Periconia</i> /myxomycetes			13
					Total	1190	230
G	G42	192070	210660	Aspergillus/Penicillium		226	53
				Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline)		339 1690	
				Basidiospores  Basidiospores		1070	270
				Cladosporium		57	270
				,	Total	2310	320
G	G42	192071	210661	Aspergillus/Penicillium		169	110
				Ascospores & basidiospores (pigmented)		57	
				Ascospores & basidiospores (mix tiny, hyaline) Basidiospores		1580	110
				Cladosporium		282	110
				Gladosportarii	Total	2090	210
1	District	191838	210738	Ascospores & basidiospores (mix tiny, hyaline)		226	
	Court 1			Aspergillus/Penicillium			53
					Total	226	53
1	District	191834	210662	Ascospores & basidiospores (mix tiny, hyaline)		57	
	Court 2			Cladosporium Aspergillus/Penicillium		57	110
				7 Sporgillus/1 Grilollilulii	Total	113	110
1	140	192058	210739	Aspergillus/Penicillium	. 3.61	339	
				Ascospores & basidiospores (pigmented)		169	
				Ascospores & basidiospores (mix tiny, hyaline)		508	_
				Cladosporium	Tetel	1000	53
	L				Total	1020	53

rable.	A.1 Continu	ea					
		Sam	ple ID			Concer	ntration es/m³)*
Floor	Location	2019	April- 2022	Fungal Type	20	(Spore	April-2022
1	160	192059	210664	Ascospores & basidiospores (mix tiny, hyaline)  Basidiospores		452	160
1	160	192060	210665	Aspergillus/Penicillium Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Cladosporium Other hyaline fungi	Total  Total	57 508 113 57 734	160 160 160
1	143 Corridor/ 143* (different locations)	192061	210663	Aspergillus/Penicillium Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Basidiospores	Total	57 226 283	53 53 110
1	135	192062	210666	Ascospores & basidiospores (mix tiny, hyaline) Basidiospores Other fungi	Total	395 113 508	53
1	Court Services Center	192063	210740	Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Basidiospores Cladosporium Epicoccum Other hyaline fungi	Total	282 508 113 113 1020	110 53 13
1	101	192064	210670	Ascospores & basidiospores (mix tiny, hyaline) Basidiospores	Total	452 452	160 160
1	101	192065	210671	Aspergillus/Penicillium Ascospores & basidiospores (mix tiny, hyaline) Ascospores Other fungi	Total	395 57 452	110 110 53
2	District Court 3	191839	210667	Ascospores & basidiospores (mix tiny, hyaline) Cladosporium	Total	57 57	110 110
2	204A	191813	210741	Aspergillus/Penicillium Ascospores & basidiospores (mix tiny, hyaline) Basidiospores	Total	282 57	53 53
2	210	191816	210668	Aspergillus/Penicillium Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Basidiospores Cladosporium Epicoccum	7001	169 57 282 57 11	110

Table	A.1 Continu	ed					
		Sam	ple ID				ntration
E1	1	0010	April-	E-mark E-mark	200		es/m³)*
Floor 2	Location 213	<b>2019</b> 191817	<b>2022</b> 210742	Fungal Type Aspergillus/Penicillium	20	113	<b>April-2022</b> 53
	·			Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Pithomyces	Total	57 621 57 847	53
2	230	191820	210669	Aspergillus/Penicillium Ascospores & basidiospores (mix tiny, hyaline)	Total	169 169	53 53
2	241	191821	210743	Aspergillus/Penicillium Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Basidiospores Smuts/Periconia/myxomycetes	Total	57 57 169	110 13 120
2	Board of Commissio ners	191824	210744	Ascospores & basidiospores (mix tiny, hyaline) Basidiospores Cladosporium	Total	508 57 565	53
2	District Court 6	191825	210674	Aspergillus/Penicillium Ascospores & basidiospores (mix tiny, hyaline) Ascospores	Total	57 226 283	110 110
2	District Court 7	191829	210675	Ascospores & basidiospores (mix tiny, hyaline) Basidiospores Cladosporium Epicoccum	Total	57 169 11 237	53
2	District Court 7	191832	210676	Aspergillus/Penicillium Ascospores & basidiospores (mix tiny, hyaline) Basidiospores Cladosporium	Total	57 57	110 53 210 370
2	District Court 10	191837	210677	Aspergillus/Penicillium Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Alternaria Cladosporium	Total	113 113 226	110 13 13 110 230
2	252	192055	210745	Aspergillus/Penicillium Ascospores & basidiospores (mix tiny, hyaline) Basidiospores	Total	57 565 622	53 110 160
2	252	192056		Ascospores & basidiospores (mix tiny, hyaline) Other hyaline fungi	Total	678 57 735	
2	246B	192057	210678	Aspergillus/Penicillium Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline)	Total	57 57 113 226	53 53

Table A	A.1 Continu	ed						
		Sam	ple ID April-				ntration es/m³)*	
Floor	Location	2019	2022	Fungal Type	20	119	April-	2022
3	317	191812	210679	Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Basidiospores Cladosporium	Total	57 57 113		53 160 210
3	374	191814	210746	Ascospores & basidiospores (mix tiny, hyaline) Cladosporium Rusts	Total	169 57 226		53 53
3	Grand Jury	191815	210680	Ascospores & basidiospores (pigmented) Cladosporium	Total	57 57		53 53
3	Law Library - West	191818	210747	Ascospores & basidiospores (mix tiny, hyaline)	Total	282 282		<13 <13
3	Law Library - East	191819	210748	Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Cladosporium	Total	113 169 282		53 53
3	Clerk of Superior Court - Criminal	191822	210681	Aspergillus/Penicillium Ascospores & basidiospores (mix tiny, hyaline) Basidiospores Cladosporium	Total	113 169 57 339		110
3	375	191823	210749	Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Basidiospores	Total	57 452 509		53 53
3	370	191826	210682	Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Basidiospores Cladosporium Other fungi	Total	113 339 57 509		53 53 110
3	Attorney's Lounge	191827	210750	Cladosporium		ND	Total	270 270
3	Superior Court 1	191835	210683	Aspergillus/Penicillium Ascospores & basidiospores (mix tiny, hyaline) Basidiospores Cladosporium	Total	1520 57 1580		110 53 160
3	Superior Court 2	191836	210684	Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Basidiospores Cladosporium	Total	57 169 226		53 370 430

Table A	A.1 Continu	ed				
		Sam	ple ID			ntration
			April-			es/m³)*
Floor	Location	2019	2022	Fungal Type	2019	April-2022
4	416	191804	210751	Aspergillus/Penicillium Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Rusts Smuts/Periconia/myxomycetes	113 282 396 57	13 13
4	Registry of Deeds Library	191805	210685	Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Basidiospores	169 395 Total 564	53 53
4	403	191806	210686	Ascospores & basidiospores (mix tiny, hyaline)	57 Total 57	ND<13
4	Registry of Probate Secretary Pool	191807	210687	Aspergillus/Penicillium Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Cladosporium Rusts Other fungi	57 226 113 57 Total 452	53 53 110
4	421	191808	210752	Basidiospores Aspergillus/Penicillium	ND	53 53 Total 110
4	Jury Pool Room	191809	210753	Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Cladosporium Nigrospora Rusts Smuts/Periconia/myxomycetes	113 113 113 57 57 Total 452	53 13
4	427	191810	210688	Aspergillus/Penicillium Ascospores & basidiospores (mix tiny, hyaline) Basidiospores	113 168 Total 282	53 53
4	412/412 Corridor*	191811	210689	Aspergillus/Penicillium Ascospores & basidiospores (mix tiny, hyaline) Basidiospores Cladosporium Other brown Other fungi	169 791 57 Total 1070	110 53 13
4	Probate Court 1	191830	210755	Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Cladosporium	113 113 Total 226	53 53
4	Probate Court 2	191831	210754	Aspergillus/Penicillium Ascospores & basidiospores (mix tiny, hyaline) Cladosporium	57 113 Total 170	53 53
	Field blank	192074	210692	ND	ND <13	ND <13
	Field blank		210693	ND		ND <13

Table A	Table A.1 Continued											
		Sam	ple ID		Concer	ntration						
			April-		(spore	es/m³)*						
Floor	Location	2019	2022	Fungal Type	2019	April-2022						
	Media	192075	210694	ND	ND <13	ND <13						
	blank											
	Media		210695	ND		ND <13						
	blank											

spores/m³ spores per cubic meter

ND none detected NA not applicable

August 2019 samples analyzed by Environmental Analysis Associates, Inc. (Bay City, Michigan)

April 2022 samples analyzed by Eurofins EMLab P&K, Fairfax, Virginia.

Method: Air-O-Cell, spore trap analysis

**Table A.2** Outdoor Air Sampling Results for Total Viable and Non-Viable Fungal (Mold) Spores, Roderick L. Ireland Courthouse, 50 State Street, Springfield, Massachusetts, August 2019 and April 2022

			Raw Spore		Concer	ntration
Sample ID	Date	Fungal Type	Count	% Read	(spore	s/m³)*
8/8/2019	192072	Alternaria Aspergillus/Penicillium Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Cladosporium Smuts/Periconia/myxomycetes Other hyaline fungi			Total	57 678 1520 43200 960 57 169 46,600
8/8/2019	192073	Alternaria Aspergillus/Penicillium Ascospores & basidiospores (pigmented) Ascospores & basidiospores (mix tiny, hyaline) Cladosporium Smuts/Periconia/myxomycetes Other hyaline fungi Other fungi			Total	11 734 1580 50700 1640 113 169 11 55,000
4/1/2022	210656	Ascospores Basidiospores Aspergillus/Penicillium	14 182 4	25 25 25	Total	750 9,700 210 11,000
4/1/2022	210657	Ascospores Basidiospores Aspergillus/Penicillium	55 121 9	25 25 25	Total	2,900 6,500 480 9,900

<sup>\*</sup> Total spore concentrations reported by the laboratory are rounded to two significant digits. At 100 percent read total counts of 13 spores/m3 indicated that based on the volume of air sampled only one spore was present.

Table A.2	Continued					
			Raw Spore		Concent	ration
Sample ID	Date	Fungal Type	Count	% Read	(spores	s/m³)*
4/1/2022	210672	Ascospores	1	25		53
		Basidiospores	19	25		1,000
		Cladosporium	3	25		160
		Aspergillus/Penicillium	2	25		110
					Total	1,300
4/1/2022	210673	Ascospores	4	25		210
		Basidiospores	27	25		1,400
		Aspergillus/Penicillium	3	25		160
					Total	1,800
4/1/2022	210690	Alternaria	3	100		40
		Ascospores	2	25		110
		Basidiospores	17	25		910
		Cladosporium	8/12	25/100		590
		Curvularia	1	100		13
		Other brown	1	100		13
		Pithomyces	1	100		13
		Smuts/Periconia/myxomycetes	1	100		13
					Total	1,700
4/1/2022	210691	Alternaria	7	100		93
		Ascospores	1	25		53
		Basidiospores	19	25		1,000
		Cladosporium	15	25		800
		Other brown	2	100		27
		Torula	1	100		13
					Total	2,000

spores/m³ spores per cubic meter ND none detected NA not applicable

August 2019 samples analyzed by Environmental Analysis Associates, Inc. (Bay City, Michigan) April 2022 samples analyzed by Eurofins EMLab P&K, Fairfax, Virginia. Method: Air-O-Cell, spore trap analysis

<sup>\*</sup> Total spore concentrations reported by the laboratory are rounded to two significant digits. At 100 percent read total counts of 13 spores/m³ indicated that based on the volume of air sampled only one spore was present.

# APPENDIX B VISUAL INSPECTION FINDINGS

**Table B.1** Water Damage and Mold Growth Identified During Visual Inspections, Roderick L. Ireland Courthouse, 50 State Street, Springfield, Massachusetts, July – September 2019 and Re-Inspection April 2022

	Visual Observa	tions
Room	2019	2022
	Ground Floor	
G03	Cracking plaster water damage on walls in back	Addressed: Touch-up needed
G06	Visible mold growth on supply diffuser	Addressed: Touch-up needed
G10	Visible mold growth on supply diffuser	Addressed: Touch-up needed
G11	Visible mold growth on supply diffuser	Addressed: Touch-up needed
G12	Visible mold growth on supply diffuser and surrounding ceiling	Addressed: Touch-up needed
G13	Visible mold growth on supply diffuser and surrounding ceiling	Addressed
G14	Visible mold growth on supply diffuser, ceiling and metal bars	Addressed: Touch-up needed
G15	Visible mold growth on supply diffuser	Addressed: Touch-up needed
G16	Visible mold growth on supply diffuser	Addressed
	Visible mold growth on metal door frame	
G17	Visible mold growth on supply diffuser	Addressed: Touch-up needed
G21	Visible mold growth on supply diffuser	Addressed: Touch-up needed
G22	Visible mold growth on supply diffuser	Addressed: Touch-up needed
G23	Visible mold growth on supply diffuser	Addressed: Touch-up needed
G24	Visible mold growth on supply diffuser	Addressed: Touch-up needed
G25	Visible mold growth on supply diffuser	Addressed: Touch-up needed
G26	Visible mold growth on supply diffuser	Addressed: Touch-up needed
G27	Water damage to back wall and ceiling above lockers     Wet ceiling tiles above lockers	Addressed: Touch-up needed
G28	Water-stained ceiling tiles	Addressed: Additional removal needed
G33	Water-stained ceiling tiles around supply diffuser	Addressed: Additional removal needed
G33	Standing water on floor by drain	Addressed
G36	Visible mold growth on the exposed duct	Addressed: Touch-up needed work
	·	ongoing
G47	Water-stained ceiling tiles	Addressed: Touch-up needed
G54	Water damage on wall behind vending machine	Additional Removal needed
	First Floor	
District Courtroom 1	Visible mold growth around lateral diffusers and surrounding ceiling tiles	Addressed: Touch-up needed
District Court	Visible mold growth on supply diffusers and	Addressed: Touch-up needed
Probation	<ul><li>surrounding ceiling tiles</li><li>Water damage on frames and wall around windows</li></ul>	
Employee Lounge	Water-stained ceiling tile     Visible mold growth on lateral diffusers and surrounding tile     Water damage on frames of windows	Addressed
Hallways	Visible mold growth on lateral diffusers and surrounding ceiling	Addressed: Touch-up needed
Judges Hallway	Water-stained ceiling tiles by entryway to 122 and 140	Addressed

	Visual Observations						
Room	2019	2022					
	First Floor (continued)						
Main Lobby	Water damage on ceiling	Addressed: Touch-up paint needed					
	<ul> <li>Visible mold growth on lateral diffusers by entryways</li> </ul>						
	Water-stained ceiling tile by Stairwell 3						
Officers Lounge	Visible mold growth on lateral diffusers	Addressed: Touch-up needed					
114	<ul> <li>Visible mold growth on supply diffuser</li> </ul>	Addressed					
	Water-stained ceiling tile by supply diffuser						
115	<ul> <li>Visible mold growth on supply diffuser</li> </ul>	Addressed: Touch-up carpet needed					
	Water-staining on carpet						
116	Visible mold growth on supply diffuser	Addressed					
117	Visible mold growth on supply diffuser	Addressed					
119	Visible mold growth on supply diffuser	Addressed					
120	Visible mold growth on supply diffuser	Addressed: Touch-up needed					
121	Water damage surrounding window	Addressed: Additional removal needed					
121A	<ul> <li>Water damage surrounding window</li> </ul>	Addressed: Touch-up needed					
	Water-stained ceiling tiles						
121B	Water damage surrounding window	Addressed: Touch-up needed					
124	<ul> <li>Water damage and staining by holding cells</li> </ul>	Addressed Diffusers					
	<ul> <li>Water damage surrounding windows (paint and wall material deteriorating)</li> </ul>	Unoccupied space					
136	Water staining on wall paint	Addressed					
137	Water-stained ceiling tiles with visible mold growth	Addressed: Touch-up needed					
137 Hallway	Water-stained ceiling tiles	Addressed					
•	Visible mold growth around lateral diffusers						
138A	Water damage on walls and ceiling in void by	Addressed: Additional Cleaning needed					
	windows						
	<ul> <li>Stained floor tiles below windows (rust)</li> </ul>						
	Water damage in perimeter units						
138	Water-stained ceiling tiles with visible mold growth	Additional work needed					
139	Water-stained ceiling tiles with visible mold growth	Addressed: Touch-up needed					
140	Water-stained ceiling tiles by windows	Addressed					
141	Visible mold growth on supply diffuser	Addressed					
142	<ul> <li>Visible mold growth on supply diffuser</li> </ul>	Addressed: Additional removal needed					
	Water-stained ceiling tile						
143	Visible mold growth on supply diffusers	Addressed: Touch-up needed left side					
144	<ul> <li>Visible mold growth on supply diffusers</li> </ul>	Addressed: Touch-up needed					
	<ul> <li>Water-stained ceiling tiles around diffusers</li> </ul>						
149	Water-stained ceiling tiles	Addressed					
150	Water-stained ceiling tile	Addressed: Touch-up needed					
155	Water-stained ceiling tile in center of room	Addressed					
157	Visible mold growth on supply diffuser	Addressed					
160	Water damage on frames of windows	Addressed					
	Visible mold growth on supply diffuser						
166	Visible mold growth on supply diffuser	Addressed					
	Second Floor						
Hallways	Visible mold growth on lateral diffusers by entryways	Addressed					
-	and ceiling tile by District Courtroom 10						
	Stained ceiling in lobby by stairwell						

	Visual Observations					
Room	2019	2022				
	Second Floor (continued)					
District Courtroom 3	Visible mold growth around lateral vents and on surrounding ceiling tiles	Addressed				
District Courtroom 4	Visible mold growth around lateral vents and on surrounding ceiling tiles	Addressed: touch-up needed				
District Courtroom 5	Visible mold growth around lateral vents and on surrounding ceiling tiles	Addressed				
District Courtroom 6	Visible mold growth around lateral vents and on surrounding ceiling tiles	Addressed: touch-up needed				
District Courtroom 7	Visible mold growth around lateral vents and on surrounding ceiling tiles	Addressed				
District Courtroom 8	Visible mold growth around lateral vents and on surrounding ceiling tiles	Addressed				
District Courtroom 9	Visible mold growth around lateral vents and on surrounding ceiling tiles	Addressed				
District Courtroom 10	Visible mold growth around lateral vents and on surrounding ceiling tiles	Addressed				
204	Stained carpeting from water damage     Water damage around windows and on wood cabinets below	Addressed: Window still leaking				
204A	<ul><li>Water-stained carpet</li><li>Water damage around windows and on wood cabinets below</li></ul>	Addressed: Ongoing work				
204B	<ul> <li>Water stained carpet</li> <li>Water damage around windows and on wood cabinets below</li> </ul>	Addressed: Ongoing work				
205	Water damage around windows	Addressed: Ongoing work				
206	<ul><li>Water damage around windows</li><li>Water-stained ceiling tiles around windows</li><li>Rust on and near perimeter unit</li></ul>	Addressed: Ongoing work				
207	<ul><li>Water-stained ceiling tiles around windows</li><li>Staining on carpet below perimeter units</li></ul>	Addressed: Ongoing work				
207A	<ul> <li>Water damage around windows</li> <li>Water-stained ceiling tiles around windows</li> <li>Staining on carpet below perimeter units</li> </ul>	Addressed: Ongoing work				
207B	<ul> <li>Water damage around windows</li> <li>Water-stained ceiling tiles around windows</li> <li>Staining on carpet below perimeter units</li> </ul>	Addressed: Ongoing work				
208	<ul> <li>Water damage on wall and frames surrounding window (in void)</li> <li>Visible mold growth on supply diffuser and surrounding ceiling tiles</li> </ul>	Addressed: Ongoing work				
209	<ul> <li>Water damage on wall and frames surrounding window (in void)</li> <li>Visible mold growth on lateral diffuser and surrounding ceiling tiles</li> </ul>	Addressed: Ongoing work				
210	Water damage on wall and frames surrounding window (in void)	Addressed				

D	Visual Observa	
Room	2019	2022
210A	Second Floor (continued)  Water damage on wall and frames surrounding window	Addressed
210A	(in void)	Addressed
211	Visible mold growth on supply diffuser and surrounding	Addressed
	ceiling tiles	
212	Visible mold growth on supply diffuser and surrounding	Cleaning Needed
	ceiling tiles	
213	Visible mold growth on supply diffuser and surrounding	Cleaning Needed
214	ceiling tiles	Addressed
214	Visible mold growth on supply diffuser and surrounding	Addressed
215	ceiling tiles  Visible mold growth on supply diffuser and surrounding	Addressed
210	ceiling tiles	Addressed
216	Visible mold growth on supply diffuser and surrounding	Cleaning Needed
210	ceiling tiles	olodiling Hooded
217	Visible mold growth on supply diffuser and surrounding	Addressed
	ceiling tiles	
218	Visible mold growth on supply diffuser and surrounding	Cleaning Needed
	ceiling tiles	
219	Visible mold growth on supply diffuser and surrounding	Cleaning Needed
220	Ceiling tiles	Classing Nacdad
220	Visible mold growth on supply diffuser and surrounding ceiling tiles	Cleaning Needed
221	Water damage on perimeter unit (staining on	Cleaning Needed
221	insulation)	Oleaning Needed
Vault 221 Hallway	Visible mold growth on lateral diffusers and	Addressed: touch-up needed
,	surrounding ceiling tiles	'
	Water-stained ceiling tile outside 220	
223	Visible mold growth on supply diffuser and surrounding	Cleaning Needed
	ceiling tiles	
223 Hallway	Visible mold growth on ceiling tiles near entryway	Addressed: touch-up needed
223A	Visible mold growth on supply diffuser and surrounding	Cleaning Needed
224	ceiling tiles  Visible mold growth on supply diffuser and surrounding	Cleaning Needed
224	ceiling tiles	Cleaning Needed
225	Visible mold growth on supply diffuser and surrounding	Cleaning Needed
220	ceiling tiles	olouring resource
226	Visible mold growth on supply diffuser and surrounding	Cleaning Needed
	ceiling tiles	· ·
230	<ul> <li>Water damage on wall by windows</li> </ul>	Cleaning Needed
	<ul> <li>Visible mold growth on supply diffusers and</li> </ul>	
	surrounding ceiling tiles	
239	Water damage on wall and frames surrounding	Addressed: Touch-up needed
	windows	
	Water damage on insulation surrounding pipes in	
	perimeter units  Water stained coiling tiles	
241	Water-stained ceiling tiles     Water-stained ceiling tile by entryway	Addressed
245	Visible mold growth on supply diffuser and surrounding	Addressed
210	ceiling tiles	7 IGGI 0330G

	Visual Observations		
Room	Visual Observations 2019 2022		
Koom	Second Floor (continued)	2022	
246	Water damage around window	Addressed: Touch-up needed	
246A	Water-stained ceiling tile by door	Cleaning needed	
= ,	Water damage around diffuser and window (in void)	l statiming trocasa	
246B	Water damage around window (in void) and on	Cleaning needed	
	replaced wall areas	3	
247	Water damage around window	Addressed: Touch-up needed	
	Visible mold growth and water damage on window		
	trim and frame		
248	Water damage around window (in void)	Addressed: Touch-up and additional	
		removal needed	
249	<ul> <li>Water damage around lateral diffuser at entryway</li> </ul>	Addressed: Touch-up needed	
	Water-stained ceiling tiles at entryway		
	Visible mold growth on supply diffuser		
	Water damage around window		
2404	Water damage surrounding perimeter units		
249A	Water-stained ceiling tiles (some tiles missing)	Addressed: Touch-up needed	
	Visible mold growth on supply diffuser		
	Water damage around window		
	Water damage surrounding perimeter units		
249B	Water-stained ceiling tiles by windows	Addressed	
	Visible mold growth on supply diffuser		
	Water damage around window		
250	Water damage surrounding perimeter units		
250	Water damage on frame and below window	Addressed	
254	Water-stained ceiling tiles by windows		
251	Water damage on walls around window (in void)	Addressed	
2514	Water-stained ceiling tiles by windows	Address	
251A	Water damage on walls around window (in void)	Addressed	
	Water-stained carpet below windows		
251B	Wet filter in perimeter unit	Addressed Touch up pooded	
20 I B	Water damage on walls around window (in void)	Addressed: Touch-up needed	
	Water-stained ceiling tiles by windows     Wighter mold grouth on comply diffuser.		
	Visible mold growth on supply diffuser     Third Floor		
Third Floor Hallways	Water-stained ceiling tiles around diffusers	Addressed: Touch-up needed	
		Addressed: Touch-up needed ongoing	
Law Library	<ul><li>Water-stained ceiling tiles</li><li>Water damage around windows (ceilings, walls and</li></ul>	work	
	frames)	WOIK	
	<ul><li>Visible mold growth on wood frames by windows</li></ul>		
	Water damage on wall (crack in wall by 309)		
Attorney's Lounge	Visible mold growth on lateral diffusers and	Addressed: Touch-up and ceiling tiles	
	surrounding brick below	needed needed	
Superior Court	Visible mold growth on supply diffusers and	Addressed	
Probation	surrounding ceiling tiles	7.44.03304	
Grand Jury	Water-stained ceiling tiles	Addressed: Touch-up needed	
Grand Sury	<ul> <li>Visible mold growth on supply diffusers and</li> </ul>		
	surrounding ceiling tiles		
	Water damage surrounding windows		

	Visual Observations		
Room	2019	2022	
	Third Floor (continued)	_	
Hearing Room 4	Visible mold growth on supply diffuser	Cleaning Needed	
303	Visible mold growth on supply diffuser	Cleaning Needed	
304	<ul> <li>Visible mold growth on supply diffuser</li> </ul>	Addressed: Touch-up needed	
	Water damage on surfaces (possibly from plants previously in the area)		
309	<ul><li>Water-stained ceiling tiles around window</li><li>Water damage around window</li></ul>	Addressed: Touch-up needed	
312	Visible mold growth on supply diffuser	Cleaning Needed	
313	Water-stained ceiling tile by window	Addressed	
313A	Water damage on wall and frames of windows	Cleaning Needed	
314	Visible mold growth on supply diffuser	Addressed	
316	Visible mold growth on supply diffuser	Addressed: Touch-up needed	
	Water damage around window frame	,	
317	Water damage on frames of windows	Addressed: Touch-up needed	
	Water damage of frames of windows     Water-stained ceiling tiles around windows	a.a. cocca caon ap nocaca	
317B	Water starried certaining thes around windows     Water damage on frames of windows	Addressed: Touch-up needed	
5	Water damage of frames of windows     Water-stained ceiling tiles around windows		
	Visible mold growth on supply diffuser		
320	Water-stained ceiling tiles	Addressed: Touch-up needed	
J20	Water-stained ceiling tiles     Water damage on window frames and surrounding	Addiessed. Todeli-up liceded	
	wall (paint bubbling)		
	Water-stained carpet below perimeter units		
320A	Water-stained carpet below perimeter units     Water-stained ceiling tiles	Addressed: Touch-up needed	
32UA	Water-stained ceiling tiles     Water damage on window frames and surrounding	Audiesseu. Tuden-up needed	
	water damage on window frames and surrounding wall (paint bubbling)		
	Water-stained carpet below perimeter units		
320B		Addressed: Touch-up needed	
JZUD	<ul> <li>Water-stained ceiling tiles</li> <li>Water damage on window frames and surrounding wall (paint bubbling)</li> <li>Water-stained carpet below perimeter units</li> </ul>	Addressed. Touch-up needed	
324	Possible water damage on ceilings of cells (peeling	Cleaning Needed	
<b>-</b> 1	paint)	1.539	
331	Visible mold growth on supply diffuser	Addressed	
332	Visible mold growth on supply diffuser	Addressed	
334	Visible mold growth on lateral diffusers, surrounding	Addressed	
	brick wall, and ceiling tiles		
337	Visible mold growth on supply diffuser	Addressed	
	Water damage on carpeting		
342	Visible mold growth on supply diffuser	Cleaning Needed	
343	Visible mold growth on supply diffuser	Addressed	
0.10	Water damage on frame of window	1.30.0000	
344	Visible mold growth on supply diffuser	Addressed	
345	Visible mold growth on supply diffuser	Addressed	
346	Water damage on window frame	Addressed	
349	Water damage on wall	Addressed	
350A	Visible mold growth on lateral diffusers and	Addressed	
	surrounding ceiling	/ Madi C33Ca	

	Visual Observations		
Room	2019	2022	
KUUIII	Third Floor (continued)	2022	
364	Visible mold growth on supply diffuser and surrounding	Addressed	
30 T	ceiling tiles	Nucleosed	
365	Visible mold growth on supply diffuser and surrounding	Addressed	
	ceiling tiles		
367	Water damage below window (possibly from plants)	Addressed: Touch-up needed	
	in the area)		
	<ul> <li>Water damage on wood frame and adjacent wall to</li> </ul>		
	window		
368	Water damage on wood frame and adjacent wall to	Addressed	
	window		
369	Water damage on frame of window	Addressed: Touch-up needed	
370	Water-stained ceiling tiles around diffusers	Addressed	
074	Wet insulation around perimeter units	Addressed	
371	Visible mold growth on lateral diffuser	Addressed	
372	Water damage on frames and wall around windows     and parimeter units (145, 144, 143, and 143)	Addressed: Touch-up and leak repair needed	
	and perimeter units (145, 144, 143, and 142)	l needed	
373	Water-stained ceiling tiles by windows     Weter damage ground window	Addressed	
0/3	<ul><li>Water damage around window</li><li>Water-stained ceiling tiles by windows</li></ul>	Addressed	
376	Visible mold growth on supply diffuser	Cleaning Needed	
377	Water damage on wall by window	Addressed: Touch-up needed	
511	Fourth Floor	Addressed. Todell up needed	
Fourth Floor Hallway	Visible mold growth around lateral vents and on	Cleaning Needed	
i cartii i loor i laliway	surrounding ceiling tiles	l seeming receive	
Land Registry	Water damage on frames around windows and wood	Addressed	
	below		
Registry of Deeds	<ul> <li>Visible mold growth on supply diffusers</li> </ul>	Addressed	
Library	<ul> <li>Water damage on ceiling tiles and frames of</li> </ul>		
	windows		
	Rust and visible mold growth on insulation around		
	perimeter units (111, 110, 112, 109, 108, 107, 106,		
400	105)	Addressed	
402	Water damage below window (possibly from plants in the assa)	Addressed	
	in the area)		
403	<ul> <li>Visible mold growth on supply diffuser</li> <li>Water damage below carpet (old Liebert unit leaked</li> </ul>	Addressed	
400	but reportedly removed)	Audi coocu	
408	Visible mold growth on supply diffusers and	Cleaning Needed	
	surrounding ceiling tiles	S. Sanning Hooded	
110	Water-stained ceiling tiles	Addressed: Touch-up needed	
411	Water-stained ceiling tiles	Addressed	
	Visible mold growth on diffusers and surrounding		
	ceiling tiles		
112	Water damage on frames and walls around windows	Addressed: Touch-up needed	
416	Visible mold growth on supply diffusers and	Addressed: Touch-up needed	
	surrounding ceiling tiles		
	<ul> <li>Water damage on frames and walls around windows</li> </ul>		

Table C.1 Continued				
Room	Room Visual Observations  Fourth Floor (continued)			
419	<ul> <li>Visible mold growth on supply diffusers and surrounding ceiling tiles</li> <li>Water damage on frames and walls around windows</li> </ul>	Addressed		
420	<ul> <li>Visible mold growth on supply diffusers and surrounding ceiling tiles</li> <li>Water damage on frames and walls around windows</li> </ul>	Addressed		
421	<ul> <li>Visible mold growth on supply diffusers and surrounding ceiling tiles</li> <li>Water damage on frames and walls around windows</li> </ul>	Addressed		
422	<ul> <li>Visible mold growth on supply diffusers and surrounding ceiling tiles</li> <li>Water damage on frames and walls around windows</li> </ul>	Addressed: Touch-up needed		
428	Water damage on frames and walls around windows	Cleaning Needed		
429	Visible mold growth and rust on supply diffusers	Cleaning Needed		
416A	<ul> <li>Visible mold growth on supply diffusers and surrounding ceiling tiles</li> <li>Water damage on frames and walls around windows</li> </ul>	Addressed: Touch-up needed		
416B	<ul> <li>Visible mold growth on supply diffusers and surrounding ceiling tiles</li> <li>Water damage on frames and walls around windows</li> </ul>	Addressed: Touch-up needed		
428A	Water-stained ceiling tiles around light     Water damage on frames and walls around windows	Addressed		
428B	Water damage on frames and walls around windows	Cleaning Needed		
446 Jury Pool		Ongoing Work: Window leak and ceiling tile removal needed		

## APPENDIX C LIMITATIONS

- 1. Environmental Health & Engineering, Inc.'s (EH&E) indoor environmental quality assessment described in the attached report number 22799.2, *Indoor Air Quality Assessment, Roderick L. Ireland Courthouse, Springfield, Massachusetts* (hereafter "the Report"), was performed in accordance with generally accepted practices employed by other consultants undertaking similar studies at the same time and in the same geographical area; and EH&E observed that degree of care and skill generally exercised by such other consultants under similar circumstances and conditions. The observations described in the Report were made under the conditions stated therein. The conclusions presented in the Report were based solely upon the services described therein, and not on scientific tasks or procedures beyond the scope of described services.
- 2. Observations were made of the site as indicated within the Report. Where access to portions of the site was unavailable or limited, EH&E renders no opinion as to the condition of that portion of the site.
- 3. The observations and recommendations contained in the Report are based on limited environmental sampling and visual observation and were arrived at in accordance with generally accepted standards of industrial hygiene practice. The sampling and observations conducted at the site were limited in scope and, therefore, cannot be considered representative of areas not sampled or observed.
- 4. When an outside laboratory conducted sample analyses, EH&E relied upon the data provided and did not conduct an independent evaluation of the reliability of these data.
- 5. The purpose of the Report was to assess the characteristics of the subject site as stated within the Report. No specific attempt was made to verify compliance by any party with all federal, state, or local laws and regulations.