

INDOOR AIR QUALITY ASSESSMENT

**Massachusetts Executive Office of Health and Human Services
600 Washington Street, 7th floor
Boston, Massachusetts**



Prepared by:
Massachusetts Department of Public Health
Bureau of Environmental Health
Indoor Air Quality Program
November 2015

Executive Summary:

No significant public health concerns were identified during this visit. Ventilation parameters of carbon dioxide, temperature and relative humidity were generally within the MDPH/IAQ recommended comfort ranges. Some water-damaged materials were found. A door leading to a freight elevator area may be a source of odors. This door needs to be made tighter with new door sweeps and gaskets.

Background

Building:	Executive Office of Health and Human Services (EOHHS)
Address:	600 Washington Street, 7 th floor, Boston, MA
Assessment Requested by:	Rhett Cavicchi, Director of Human Resources-Children, Youth and Families
Date of Assessment:	October 15, 2015
Bureau of Environmental Health/Indoor Air Quality (BEH/IAQ) Program Staff Conducting Assessment:	Ruth Alfasso, Environmental Engineer/Inspector Jason Dustin, Environmental Analyst/Inspector
Date of Building Construction:	1904
Reason for Request:	Respiratory concerns/general assessment

Building Description

The EOHHS space is housed in a seven-story, brick-faced building that reportedly underwent interior renovations in 2011 including updated lighting, carpeting, interior walls, ceiling tiles and furnishings. The building has a flat roof with a black rubber membrane. The

building houses offices, conference rooms, open cubicle areas, and storage rooms. Windows are not openable.

Results and Discussion

This space is occupied by approximately 300 employees. Members of regional EOHHS agencies also visit the space daily for trainings. Test results are presented in Table 1. Methods and indoor air related sampling information can be found in the IAQ Manual and Appendices for IAQ Reports, which can be found at:

<http://www.mass.gov/eohhs/gov/departments/dph/programs/environmental-health/exposure-topics/iaq/iaq-rpts/general-appendices-for-iaq-reports.html>

Ventilation

It can be seen from Table 1 that carbon dioxide levels were below 800 parts per million (ppm) in almost all areas surveyed indicating adequate ventilation throughout the 7th floor. Mechanical ventilation is provided by rooftop air handling units (AHUs). Ducts carry air from the AHUs to offices and distribute tempered air via supply vents (Picture 1). Return air is drawn into ceiling-mounted vents (Picture 2) and brought back to AHUs through a ceiling plenum. In some areas, such as the kitchen, restrooms and some conference rooms, direct exhaust vents are present to remove stale air and generated pollutants from the building without recirculating them in the building's general ventilation system.

To maximize air exchange, the Massachusetts Department of Public Health (MDPH) recommends that both supply and exhaust ventilation operate continuously during periods of occupancy. The MDPH recommends that thermostats be set to the fan "on" setting during occupied hours to provide a *continuous* source of fresh air and filtration.

Temperature and Relative Humidity

Indoor temperature measurements ranged from 72°F to 76°F (Table 1), which were within the MDPH recommended comfort range. The MDPH recommends that indoor air temperatures be maintained in a range of 70°F to 78°F in order to provide for the comfort of building occupants.

Indoor relative humidity (RH) ranged from 30 to 44 percent (Table 1), with RH below the MDPH comfort range in some areas. The MDPH recommends a comfort range of 40 to 60 percent for indoor air relative humidity. Relative humidity levels in the building would be expected to drop during winter months due to heating. The sensation of dryness and irritation is common in a low relative humidity environment. Low relative humidity is a very common problem during the heating season in the northeast part of the United States.

Microbial/Moisture Concerns

Water-damaged ceiling tiles were observed in some areas (Pictures 3 and 4; Table 1). The US Environmental Protection Agency (US EPA) and the American Conference of Governmental Industrial Hygienists (ACGIH) recommend that porous materials (e.g., carpeting, gypsum wallboard) be dried with fans and heating within 24 to 48 hours of becoming wet (US EPA, 2001; ACGIH, 1989). If not dried within this time frame, mold growth may occur. Once mold has colonized porous materials, they are difficult to clean and should be removed. The source of the leak above the ceiling tiles should be repaired and the water-damaged ceiling tiles should be removed and replaced.

Plants were observed in some offices and open areas (Pictures 5 and 6; Table 1). Plants can be a source of pollen and mold, which can be respiratory irritants to some individuals. Plants should be properly maintained, over-watering of plants should be avoided and drip pans should be inspected periodically for mold growth and cleaned or replaced as necessary.

Water dispensing equipment and small refrigerators were observed in carpeted areas (Picture 7; Table 1). Spills or leaks from this equipment can moisten carpet and lead to microbial growth and carpet degradation.

Other IAQ Evaluations

Indoor air quality can be negatively influenced by the presence of respiratory irritants, such as products of combustion. The process of combustion produces a number of pollutants. Common combustion emissions include carbon monoxide, carbon dioxide, water vapor, and smoke (fine airborne particle material). Of these materials, exposure to carbon monoxide and particulate matter with a diameter of 2.5 micrometers (μm) or less (PM_{2.5}) can produce immediate, acute health effects upon exposure. To determine whether combustion products were

present in the indoor environment, BEH/IAQ staff obtained measurements for carbon monoxide and PM2.5

Carbon Monoxide

Carbon monoxide should not be present in a typical, indoor environment. If it is present, indoor carbon monoxide levels should be less than or equal to outdoor levels. Carbon monoxide levels outdoors were measured at 1.6 ppm. No measureable levels of carbon monoxide were detected inside the building during the assessment.

Particulate Matter

Outdoor PM2.5 concentrations were measured at 19 $\mu\text{g}/\text{m}^3$ (Table 1), which were below the NAAQS limit of 35 $\mu\text{g}/\text{m}^3$. Indoor PM2.5 levels ranged from 1 to 15 $\mu\text{g}/\text{m}^3$ (Table 1), which were also below the NAAQS PM2.5 level of 35 $\mu\text{g}/\text{m}^3$. Frequently, indoor air levels of particulate matter (including PM2.5) can be at higher levels than those measured outdoors.

Volatile Organic Compounds (VOCs)

Exposure to low levels of total VOCs (TVOCs) may produce eye, nose, throat and/or respiratory irritation in some sensitive individuals. In order to determine if VOCs were present, BEH/IAQ staff examined rooms for products containing VOCs. BEH/IAQ staff noted air fresheners, hand sanitizer, cleaners and dry erase materials in use within the space (Table 1). All of these have the potential to be irritants to the eyes, nose, throat and respiratory system of sensitive individuals.

Other Concerns

Other conditions that can affect IAQ were observed during the assessment. Some personal fans and supply vents were observed to be dusty (Picture 8). Also, one return vent was noted to have debris behind the vent (Picture 2). Dust on these items can be reaerosolized and cause irritation or odors.

BEH/IAQ staff observed a door leading to an unoccupied space containing freight elevators (Picture 9). Large gaps were noted beneath the door into the hallway. If freight

elevators are used, the area can be pressurized and distribute odors and particulate matter to occupied areas. The installation of a tight-fitting door sweep and gaskets would help mitigate this concern. A stack of new AHU filters were found stored in this room (Picture 10). These filters should be stored in a sealed bag or container to prevent them from absorbing odors or dust prior to installation.

In some areas, accumulation of items, including papers, boxes, and personal items, were stored on floors desks, tables, and counters (Picture 11). Large numbers of items provide a source for dusts to accumulate. These items make it difficult for custodial staff to clean. Items should be relocated and/or cleaned periodically to avoid excessive dust build up.

Some EOHHS staff members reported complaints regarding drafts due to the direction of airflow from supply diffusers. In some areas, staff have taped over supply diffusers (Picture 12).

Conclusions/Recommendations

In view of the findings at the time of the visit, the following recommendations are made:

1. Continue to operate all thermostats in the fan “on” setting to provide continuous airflow/filtration during occupied hours.
2. Replace water-damaged ceiling tiles once the source of the leak is discovered and repaired.
3. Consider placing water dispensers/small refrigerators in non-carpeted areas or place a waterproof mat underneath them.
4. Maintain indoor plants, use non-porous drips pans, prevent overwatering and refrain from placing them near supply diffusers.
5. Consider installing a tight-fitting door sweep and gaskets for the door leading to the freight elevators.
6. Store new AHU filters in a sealed bag or container to prevent damage/contamination.
7. Reduce the use of items containing VOCs including scented cleaners, air fresheners, dry erase materials and hand sanitizer.
8. Clean surfaces, carpets and vents on a preventative maintenance schedule.
9. Store items in an organized manner and move them to clean periodically to prevent a buildup of dust.

10. Consider redirecting supply diffusers in areas where staff have reported comfort complaints and remove blockages to airflow.
11. For buildings in New England, periods of low relative humidity during the winter are often unavoidable. Therefore, scrupulous cleaning practices should be adopted to minimize common indoor air contaminants whose irritant effects can be enhanced when the relative humidity is low. To control for dusts, a high efficiency particulate arrestance (HEPA) filter equipped vacuum cleaner in conjunction with wet wiping of all surfaces is recommended. Avoid the use of feather dusters. Drinking water during the day can help ease some symptoms associated with a dry environment (throat and sinus irritations).
12. Refer to resource manuals and other related indoor air quality documents for further building-wide evaluations and advice on maintaining public buildings. These materials are located on the MDPH's website: <http://mass.gov/dph/iaq>.

References

ACGIH. 1989. Guidelines for the Assessment of Bioaerosols in the Indoor Environment. American Conference of Governmental Industrial Hygienists, Cincinnati, OH.

US EPA. 2001. Mold Remediation in Schools and Commercial Buildings. US Environmental Protection Agency, Office of Air and Radiation, Indoor Environments Division, Washington, DC. EPA 402-K-01-001. March 2001.

Picture 1



Supply diffuser

Picture 2



Ceiling-mounted return air grate (note debris in vent)

Picture 3



Water-damaged ceiling tile

Picture 4



Water-damaged ceiling tile

Picture 5



Plant on carpeting

Picture 6



Plants located under supply air stream

Picture 7



Small refrigerator and water dispenser on carpet (note carpet staining)

Picture 8



Personal fan showing dust accumulation

Picture 9



Unoccupied area with freight elevators

Picture 10



New AHU filters stored unprotected in freight elevator room

Picture 11



Large accumulation of items on flat surfaces

Picture 12



Supply vent showing tape blocking vent openings

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m ³)	Occupants in Room	Windows Openable	Ventilation		Remarks
								Intake	Exhaust	
Background outside	483	1.6	61	54	19					
Cubicle near kitchen	651	ND	76	31	3	0	N	N	N	HS
DVS supply room	684	ND	73	42	3	0	N	Y	Y	
Elevator lobby	741	ND	75	35	5	2	N	Y	Y	Slight oil odor
Freight elevator area										Needs door sweeps, complete plenum. Stored antifreeze and air filters
Ladies room							N	Y	Y	Ducted exhaust
Waiting	734	ND	75	34	5	0	N	Y	Y	WC on carpet
7004 conference	716	ND	74	34	2	0	N	Y	Y	
7009 training	789	ND	74	36	3	1	N	Y	Y	

ppm = parts per million AI = accumulated items DEM = dry erase materials HS = hand sanitizer WC = water cooler
 µg/m³ = micrograms per cubic meter AP = air purifier DO = door open NC = non-carpeted WD = water-damaged
 ND = non detect CP = cleaning products HEPA = high efficiency particulate arrestance PC = photocopier ½ = half wall office
 AF = air freshener CT = ceiling tile PF = personal fan

Comfort Guidelines

Carbon Dioxide: < 800 ppm = preferred	Temperature: 70 - 78 °F
> 800 ppm = indicative of ventilation problems	Relative Humidity: 40 - 60%

Table 1 (continued)

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m ³)	Occupants in Room	Windows Openable	Ventilation		Remarks
								Intake	Exhaust	
7011 Interview	780	ND	74	37	3	0	N	Y	Y	
7013	721	ND	75	32	4	3	N	Y	Y	AT, DO, plants and dried flowers
7015	687	ND	74	33	3	0	N	Y	Y	
7016	688	ND	73	34	2	1	N	Y	Y	DO, HS
7017	697	ND	73	34	7	1	N	Y	Y	DO, heater
7018	682	ND	73	34	2	2	N	Y	Y	AP/fan, plants
7019	676	ND	73	34	1	0	N	Y	Y	Plant, popcorn odor
7020	693	ND	73	34	2	0	N	Y	Y	Heater on
7021	741	ND	73	35	2	0	N	Y	Y	DO

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NC = non-carpeted

PC = photocopier

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Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m ³)	Occupants in Room	Windows Openable	Ventilation		Remarks
								Intake	Exhaust	
7022	704	ND	73	37	3	1	N	Y	Y	
7024	703	ND	73	37	3	0	Y	Y	Y	CPs
7030 cubes	719	ND	73	35	2	2	N	Y	Y	PF
7035	723	ND	73	37	2	0	N	Y	Y	PF
7036 cubes	743	ND	73	37	4	0	N	Y	Y	
7037 cubes	740	ND	73	37	3	1	N	Y	Y	
7047 cubes	701	ND	74	34	2	2	N	Y	Y	
7050	688	ND	75	32	5	0	N	Y	Y	PF (on), DO
7051	680	ND	75	31	6	0	N	Y	Y	WC on carpet

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Table 1 (continued)

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m ³)	Occupants in Room	Windows Openable	Ventilation		Remarks
								Intake	Exhaust	
7052	751	ND	75	32	4	1	N	Y	Y	PF, DEM
7054	675	ND	73	32	2	1	N	Y	N	DO
7055	668	ND	73	35	3	1	N	Y	Y	DEM
7056	678	ND	74	36	3	0	N	Y	Y	
7057 ½	692	ND	74	32	6	0	N	Y	N	
7058 ½	715	ND	74	33	14	2	N	Y	N	
7059 ½	705	ND	74	33	2	0	N	Y	Y	
7064 cubes	693	ND	74	33	3	2	N	Y	Y	Plants
7066 cubes	643	ND	74	36	2	1	N	Y	Y	Plants

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Temperature: 70 - 78 °F
Relative Humidity: 40 - 60%

Location: EOHHS

Indoor Air Results

Address: 600 Washington St. 7th floor, MA

Table 1 (continued)

Date: 10/15/2015

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m ³)	Occupants in Room	Windows Openable	Ventilation		Remarks
								Intake	Exhaust	
7071 cubes	683	ND	73	34	2	2	N	Y	Y	Plants
7074 cubes	743	ND	73	37	4	1	N	Y	Y	PF
7076	626	ND	73	34	2	0	N	Y	Y	DO, HS, DEM
7077	673	ND	73	34	1	0	N	Y	Y	DO
7078	662	ND	73	36	3	2	N	Y	Y	DEM
7080	671	ND	74	33	2	2	N	Y	Y	DO
7081	606	ND	73	35	3	0	N	Y	Y	
7082	658	ND	74	33	2	2	N	Y	Y	AP
7083	603	ND	73	36	2	0	N	Y	Y	AI

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Temperature: 70 - 78 °F
Relative Humidity: 40 - 60%

Table 1 (continued)

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m ³)	Occupants in Room	Windows Openable	Ventilation		Remarks
								Intake	Exhaust	
7085	634	ND	74	31	2	2	N	Y	Y	
7086	578	ND	73	33	3	1	N	Y	Y	
7087	618	ND	74	31	2	2	N	Y	Y	DEM, DO
7088	557	ND	73	32	4	0	N	Y	Y	
7089	711	ND	74	33	2	2	N	Y	Y	
7090 ½	624	ND	74	32	2	2	N	N	N	Space behind cube wall and window
7091 ½	633	ND	74	32	3	3	N	Y	Y	DO
7095 cubes	585	ND	74	30	3	2	N	Y	Y	Plants
7097	538	ND	74	32	2	2	N	Y	Y	

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								Intake	Exhaust	
7098	545	ND	74	32	2	1	N	Y	Y	
7100	560	ND	74	33	2	1	N	Y	Y	AI
7104 cubes	676	ND	75	32	2	2	N	Y	Y	Solar gain, fan, AI on floor
7104 reception	707	ND	75	31	15	2		Y	Y	PF
7107 cubes	636	ND	75	34	2	2	N	Y	Y	Crock pot
7108 ½	659	ND	74	33	4	4	N	N	Y	DO
7109 copy	654	ND	74	32	3	3	N	Y	N	NC, 1 WD CT, PCs, mini fridge, food outside PC room
7110	613	ND	74	31	2	3	N	Y	Y	
7111	611	ND	74	30	2	0	N	Y	Y	DO

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Carbon Dioxide: < 800 ppm = preferred	Temperature: 70 - 78 °F
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								Intake	Exhaust	
7112	570	ND	74	30	2	0	N	Y	Y	DO
7113	588	ND	74	31	4	3	N	Y	Y	Fridge on carpet
7114 ½	612	ND	74	31	3	0	N	Y	Y	
7115	710	ND	74	33	3	1	N	Y	Y	HS
7119 cubes	654	ND	74	34	1	0	N	Y	N	
7123 cubes	670	ND	75	35	2	2	N	Y	Y	
7126 ½	682	ND	75	35	2	1	N	N	Y	Plants and dried flowers
7130 ½	658	ND	75	34	3	0	N	Y	N	PF on, DEM
7132 kitchen	626	ND	76	33	8	0	N	Y	Y	NC, fridges and microwaves and toasters. Stained fridge gasket

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Table 1 (continued)

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m ³)	Occupants in Room	Windows Openable	Ventilation		Remarks
								Intake	Exhaust	
7134 cubes	640	ND	75	32	4	3	N	Y	Y	PF on
7135 cubes	614	ND	74	35	3	2	N	Y	Y	
7138 cubes	677	ND	75	36	4	1	N	Y	Y	PF, HS
7141 cubes	665	ND	75	34	1	1	N	Y	Y	
7142 cubes	669	ND	75	35	2	1	N	Y	Y	
7143 cubes	642	ND	75	33	2	1	N	Y	Y	HS
7146	588	ND	75	34	2	1	N	Y	Y	
7147 ½	662	ND	75	34	8	0	N	N	N	PC in hall
7148 ½	658	ND	75	34	5	1	N	N	N	DEM

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Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m ³)	Occupants in Room	Windows Openable	Ventilation		Remarks
								Intake	Exhaust	
7149 ½	668	ND	75	35	4	1	N	N	N	
7151 cubes	637	ND	74	35	3	1	N	Y	Y	AI, supply diffuser overhead
7152 cubes	816	ND	75	35	5	2	N	Y	Y	HS, Personal HEPA air filter, PF
7155 cubes	688	ND	75	35	4	2	N	Y	Y	Plants
7167	668	ND	75	36	4	0	N	Y	Y	DEM, PF
7169	741	ND	75	37	6	0	N	Y	Y	DEM
7170 RMV library	685	ND	74	37	2	0	N	Y	Y	DO
7173	689	ND	75	37	3	1	N	Y	Y	
7176	663	ND	75	38	3	2	N	Y	Y	

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								Intake	Exhaust	
7181	659	ND	75	35	1	0	N	Y	Y	Plant
7185 cubes	730	ND	73	40	2	2	N	Y	Y	Plants
7188	695	ND	75	37	3	2	N	Y	Y	
7190	683	ND	75	38	3	2	N	Y	Y	DEM
7192	734	ND	75	38	3	0	N	Y	Y	AI
7193	682	ND	74	40	4	0	N	Y	Y	DEM
7195 cubes	665	ND	73	40	3	0	N	Y	Y	DEM, AI
7197 ½	720	ND	74	37	1	0	N	N	N	PF
7198 ½	717	ND	74	39	2	0	N	N	N	DO, AI

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Table 1 (continued)

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								Intake	Exhaust	
7199 ½ wall	700	ND	74	39	1	0	N	N	N	DO, HS in hall
7203 cubes	738	ND	73	40	4	1	N	Y	Y	Plants
7207 cubes	705	ND	74	39	2	0	N	Y	Y	Items, plants, dog accoutrements
7210 cubes	754	ND	74	40	2	1	N	Y	Y	
7212 cubes	723	ND	73	40	4	1	N	Y	Y	Plush items
7217	685	ND	73	42	2	1	N	Y	Y	Plants
7219 cubes	716	ND	74	39	5	1	N	Y	Y	Plants
7222 cubes	694	ND	74	39	8	1	N	Y	Y	PFs
7223	657	ND	72	41	3	0	N	Y	Y	Plants

ppm = parts per million

µg/m³ = micrograms per cubic meter

ND = non detect

AF = air freshener

AI = accumulated items

AP = air purifier

CP = cleaning products

CT = ceiling tile

DEM = dry erase materials

DO = door open

HEPA = high efficiency particulate arrestance

HS = hand sanitizer

NC = non-carpeted

PC = photocopier

PF = personal fan

WC = water cooler

WD = water-damaged

½ = half wall office

Comfort Guidelines

Carbon Dioxide: < 800 ppm = preferred
> 800 ppm = indicative of ventilation problems

Temperature: 70 - 78 °F
Relative Humidity: 40 - 60%

Table 1 (continued)

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m ³)	Occupants in Room	Windows Openable	Ventilation		Remarks
								Intake	Exhaust	
7224	710	ND	73	43	4	0	N	Y	Y	Plants
7225	686	ND	73	42	3	0	N	Y	Y	DEM
7226	691	ND	72	43	3	1	N	Y	Y	Plants, PF
7227	730	ND	73	42	1	1	N	Y	Y	DEM, plant, AT
7228	722	ND	73	41	1	0	N	Y	Y	Printer
7229	700	ND	73	41	1	0	N	Y	Y	Plants, shoes, DO
7230	700	ND	73	41	2	0	N	Y	Y	AI on floor, plant
7231	717	ND	72	44	3	1	N	Y	Y	DEM, plant
7233 cubes	642	ND	73	40	2	0	N	Y	Y	DEM

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Table 1 (continued)

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m ³)	Occupants in Room	Windows Openable	Ventilation		Remarks
								Intake	Exhaust	
7235 cubes	648	ND	73	40	3	1	N	Y	Y	HS, PF
7241 cubes	650	ND	73	40	3	1	N	Y	Y	PF
7245 cubes	665	ND	73	41	2	1	N	Y	Y	Plant
7246 conf	685	ND	73	39	1	2	N	Y	Y	DEM
7248 conf	686	ND	73	39	2	0	N	Y	Y	DO, perfume/body odor, DEM
7250	774	ND	73	40	1	1	N	Y	Y	DEM, AI, papers on floor
7251 conf	665	ND	73	38	1	0	N	Y	Y	DEM, direct and return exhaust in this room
7252	670	ND	73	38	1	0	N	Y	Y	DEM
7253	671	ND	73	38	1	1	N	Y	Y	DEM, DO, PC in hall

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Table 1 (continued)

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m ³)	Occupants in Room	Windows Openable	Ventilation		Remarks
								Intake	Exhaust	
7254	667	ND	73	38	2	0	N	Y	Y	DEM
7254A	680	ND	73	39	1	0	N	Y	Y	Workroom – big printers, fridge on carpet, microwave
7261 cubes	624	ND	74	37	3	2	N	Y	Y	Numerous stored computers
7262 conference	786-818	ND	75	37	7	10	N	Y	Y	
7263	638	ND	74	34	1	0	N	Y	Y	DEM, DO
7264	645	ND	74	35	1	0	N	Y	Y	Coffee pot, DO
7265	621	ND	74	35	1	0	N	Y	Y	Toaster and microwave
7266	658	ND	74	35	2	1	N	Y	Y	DEM
7267	638	ND	74	35	1	0	N	Y	N	WD CT

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Temperature: 70 - 78 °F
Relative Humidity: 40 - 60%

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m ³)	Occupants in Room	Windows Openable	Ventilation		Remarks
								Intake	Exhaust	
7268 ½	688	ND	74	36	3	0	N	Y	Y	Skylight/window beyond wall/ceiling
7269 ½	687	ND	74	36	2	1	N	Y	Y	
7270 ½	658	ND	74	36	2	0	N	Y	Y	
7271	663	ND	74	36	1	0	N	Y	Y	
7272	716	ND	74	37	2	0	N	Y		
Corridor outside 7272	-	-	-	-	-	-	-	-	-	WD CTs
7273 cubes	677	ND	74	38	4	0	N	Y	Y	HS, AF
7275 cubes	639	ND	74	37	2	1	N	Y	Y	
7279 cubes	625	ND	74	37	3	1	N	Y	Y	PF, CPs

ppm = parts per million AI = accumulated items DEM = dry erase materials HS = hand sanitizer WC = water cooler
 µg/m³ = micrograms per cubic meter AP = air purifier DO = door open NC = non-carpeted WD = water-damaged
 ND = non detect CP = cleaning products HEPA = high efficiency particulate arrestance PC = photocopier ½ = half wall office
 AF = air freshener CT = ceiling tile PF = personal fan

Comfort Guidelines

Carbon Dioxide: < 800 ppm = preferred	Temperature: 70 - 78 °F
> 800 ppm = indicative of ventilation problems	Relative Humidity: 40 - 60%

Location: EOHHS

Indoor Air Results

Address: 600 Washington St. 7th floor, MA

Table 1 (continued)

Date: 10/15/2015

Location	Carbon Dioxide (ppm)	Carbon Monoxide (ppm)	Temp (°F)	Relative Humidity (%)	PM2.5 (µg/m ³)	Occupants in Room	Windows Openable	Ventilation		Remarks
								Intake	Exhaust	
7282 cubes	640	ND	74	37	3	2	N	Y	Y	
7283 cubes	623	ND	75	37	4	1	N	Y	Y	Space heater
7294	709	ND	73	39	1	0	N	Y	Y	Plant, DEM

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