

Item #bc. JFK

JFK Part I

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Fred Gerber
Deputy Director, Enfield Public Works
Re: Mold and Indoor Air Quality Results
John F. Kennedy Middle School
December 6, 2023

On September 25-27, 2023, EnviroMed Services conducted a Baseline Mold and Indoor Air Quality Assessment at John F. Kennedy Middle School. The initial findings revealed elevated levels of airborne *Stachybotrys* mold spores in the 1st Floor Green Wing Hallway near the windows. *Stachybotrys* is an indicator of high moisture content and elevations are not unusual during periods of higher humidity or moisture levels.

Following these findings, the Green Wing Hallway was cleaned and disinfected thoroughly to eliminate any elevations of airborne mold. On November 7, 2023, EnviroMed Services conducted Clearance Air Testing in the Green Wing Hallway by the windows to confirm the successful remediation of the airborne elevation. This air test revealed no elevations of *Stachybotrys* or any other airborne mold. EnviroMed Services considers this Test a PASS and considers the space safe for student use.

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Baseline Indoor Air Quality Report For

John F. Kennedy Middle School
155 Raffia Road
Enfield, CT 06082

Prepared For

Russell and Dawson
1111 Main Street
East Hartford, CT 06108

Dates of Inspection and Testing:

September 25 – September 27, 2023
and November 7, 2023

Revision Date:

December 5, 2023

EnviroMed Project

IH-23-1377

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I. PROJECT NARRATIVE

Overview

From September 25 to September 27, 2023, and on November 7, 2023, EnviroMed Services conducted a microbial and indoor air quality assessment for John F. Kennedy Middle School, located at 155 Raffia Road, Enfield, Connecticut. The purpose of this assessment, as directed by Russell and Dawson Architects & Engineers (the Client), was to measure indoor air quality and baseline survey of high occupancy areas for airborne fungal contamination.

Methods

The following sampling and assessment scheme was employed:

- Direct reading measurements were collected using a TSI Q-Trak™ model 8550/8551 IAQ Monitor. The baseline indoor air quality (IAQ) parameters temperature (°F), relative humidity (%), carbon monoxide (ppm), and carbon dioxide (ppm).
- Direct reading measurements for Volatile Organic Compounds (VOCs) were taken using a ppb RAE 3000 Photo Ionization Detector (PID).
- Direct reading measurements were taken for total particulates in the air using an MIE PDR 1000 Personal Data Ram Particle Analyzer.
- Direct reading measurements for Formaldehyde were taken using a Single Gas Forensics Detector.
- Conduct air sampling to measure the presence of airborne fungal structures, including spores, by drawing air through a Zefon Air-O-Cell cassette using a pre-calibrated vacuum pump. In this method, air enters the cassette and particles are collected on the sampling substrate. The manufacturer-recommended flow rate of 15 liters per minute of air, for a duration of 10 minutes, was used to collect each sample. Sample locations were selected based on client direction. A total of 30 samples were sent to Hayes Microbial Consulting in Midlothian, VA, for analysis by optical microscopy. Hayes Microbial Consulting is approved by the American Industrial Hygiene Association (188863) and the state of Connecticut Department of Public Health. The results are represented in counts of fungal structures and fungal structures per cubic meter of air (spores/m³).

Summary of Results

Indoor Air Quality Results

Indoor Air Quality Parameters:

Temperature: The ASHRAE recommended temperatures range from 72.0 to 80.0 °F (for Summer Months).

Relative Humidity: The ASHRAE recommended range for indoor relative humidity is 20 to 60 percent.

Carbon Monoxide: The OSHA PEL limit for carbon monoxide is 50 ppm, reported as an 8-hour time-weighted average.

Carbon Dioxide: Per the ASHRAE Standard 62-2001, Ventilation for Acceptable Indoor Air Quality, the difference between the indoor and outdoor concentrations should be less than 707 ppm. Additionally, the OSHA permissible exposure limit for carbon dioxide is 5000 ppm.

Particulates in Air (Dust): The OSHA Permissible Exposure Limit (PEL) for respirable and total particulates is 0.013 mg/m³

Volatile Organic Compounds (VOCs): The maximum concentration of Total VOCs per the Leadership in Energy and Environmental Design (LEED) Standards is 0.5 ppm.

Formaldehyde (CH₂O): The OSHA formaldehyde limit is 0.75 ppm, reported as an 8-hour time weighted average.

IAQ Readings - September 25, 2023

Temperature: The indoor temperatures ranged from 63.3 to 73.7 °F. The indoor temperatures were generally within the ASHRAE recommended range.

Relative Humidity: The indoor relative humidity ranged from 58.0 to 69.9 percent. Some of the relative humidity readings were above the ASHRAE recommended range.

Carbon Monoxide: Indoor carbon monoxide concentrations ranged from ppm 0.7 to 1.0 ppm. These concentrations are below the OSHA PEL limit.

Carbon Dioxide: The outside carbon dioxide concentration recorded on this day was 627 ppm. The indoor concentrations ranged from 600 to 1060 ppm. The difference between the highest indoor concentration and the outdoor concentration was 460 ppm. This is within the recommended range. Additionally, carbon dioxide concentrations were well below the OSHA permissible exposure limit.

Particulates in Air (Dust): The indoor concentration of particulates in air inside the building exceeded the recommended 0.013 mg/m³. The concentration of particulates in air inside the

building ranged from 0.005 to 0.028mg/m³. The higher of the two was 0.015 mg/m³ above the recommended limit.

Volatile Organic Compounds (VOCs): VOC readings ranged from 0.0 to 0.375 which is below the standard of 0.5 ppm.

Formaldehyde: Formaldehyde levels did not exceed 0.00 ppm throughout the testing. This concentration is below the OSHA formaldehyde limit.

IAQ Readings - September 26, 2023

Temperature: The indoor temperatures ranged from 64.4 to 72.4 °F. The indoor temperatures were generally within the ASHRAE recommended range.

Relative Humidity: The indoor relative humidity ranged from 56.8 to 77.3 percent. Some of the relative humidity readings were above the ASHRAE recommended range.

Carbon Monoxide: Indoor carbon monoxide concentrations ranged from ppm 0.6 to 0.9 ppm. These concentrations are below the OSHA PEL limit.

Carbon Dioxide: The outside carbon dioxide concentration recorded on this day was 536 ppm. The indoor concentrations ranged from 557 to 1220 ppm. The difference between the highest indoor concentration and the outdoor concentration was 684 ppm. This is within the recommended range. Additionally, carbon dioxide concentrations were well below the OSHA permissible exposure limit.

Particulates in Air (Dust): The indoor concentration of particulates in air inside the building exceeded the recommended limit of 0.013 mg/m³. The concentration of particulates in air inside the building ranged from 0.002 to 0.026 mg/m³. The highest concentration was 0.013 mg/m³ above the recommended limit.

Volatile Organic Compounds (VOCs): VOC readings ranged from 0.025 to 0.633 which is above the standard of 0.5 ppm.

Formaldehyde: Formaldehyde levels did not exceed 0.00 ppm throughout the testing. This concentration is below the OSHA formaldehyde limit.

IAQ Readings - September 27, 2023

Temperature: The indoor temperatures ranged from 66.5 to 73.5 °F. The indoor temperatures were above the ASHRAE recommended range.

Relative Humidity: The indoor relative humidity ranged from 48.1 to 80.2 percent. The relative humidity readings were well above the ASHRAE recommended range.

Carbon Monoxide: Indoor carbon monoxide concentrations ranged from ppm 0.4 to 0.9 ppm. This concentration is below the OSHA PEL limit.

Carbon Dioxide: The outside carbon dioxide concentration recorded on this day was 572 ppm. The indoor concentrations ranged from 555 to 1044 ppm. The difference between the highest indoor concentration and the outdoor concentration was 472 ppm. This is within the recommended range. Additionally, carbon dioxide concentrations were well below the OSHA permissible exposure limit.

Particulates in Air (Dust): The indoor concentration of particulates in air inside the building did not exceed the recommended limit of 0.013 mg/m³. The concentration of particulates in air inside the building ranged from 0.001 to 0.013 mg/m³. The highest concentration was at the recommended limit.

Volatile Organic Compounds (VOCs): VOC readings ranged from 0.112 to 0.446 which is below the standard of 0.5 ppm.

Formaldehyde: Formaldehyde levels did not exceed 0.00 ppm throughout the testing. This concentration is below the OSHA formaldehyde limit.

Air-O-Cell Spore Trap Sampling Results

There are currently no federal or State of Connecticut regulatory standards for concentrations of mold in air. However, some commonly used guidelines have been established. Commonly accepted guidelines of 2,500 counts/m³ for commercial buildings and 5,000 counts/m³ for residential buildings (“Assessment and Sampling Approaches for Indoor Microbiological Assessments” by G. Clark, published in *The Synergist*, November 2001) can be considered valid for air quality assessment purposes. Any spore counts significantly higher than the accompanying baseline sample may indicate a source of fungal amplification.

Microbial Organism Descriptions:

Alternaria: Common allergens that are associated with hypersensitivity pneumonitis. This species can also produce mycotoxins that are associated with human disease.

Ascospores: Health effects are poorly studied, but spores are likely to be allergenic.

Aspergillus/Penicillium: Common allergens that are associated with hypersensitivity pneumonitis. These species can also produce mycotoxins that are associated with human disease.

Basidiospores: Common allergens that are associated with hypersensitivity pneumonitis.

Cladosporium: Common allergens that are associated with hypersensitivity pneumonitis.

Curvularia: Common allergens and a common cause of allergic fungal sinusitis.

Epicoccum: Common allergens with no reported cases of infection in humans.

Myxomycetes: Some allergenic properties are reported, but spores pose no threat to human health.

Pithomyces: Allergenic properties are poorly studied with no reported cases of infection in humans.

Stachybotrys: Produce potent mycotoxins that can suppress the human immune system, affecting the lymphoid tissue and bone marrow. The produced mycotoxin is also reported to be a liver and kidney carcinogen.

Air-O-Cell Sampling Results – September 25, 2023

Sample ID: A2 **Sample Location: Green Wing Hallway**

Low levels of *Alternaria*, *Myxomycetes*, and *Pithomyces* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A3 **Sample Location: Classroom H118**

Low levels of *Myxomycetes* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A4 **Sample Location: Classroom B113**

Low levels of *Ascospores* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of this genus in this location.

Sample ID: A5 **Sample Location: Cafeteria**

Low levels of *Ascospores*, *Aspergillus*/*Penicillium*, *Basidiospores*, and *Cladosporium* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A6 **Sample Location: Classroom R115**

Low levels of *Curvularia* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A7

Sample Location: Tech Room H123

Low levels of *Myxomycetes* and *Pithomyces* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A8

Sample Location: Classroom W24

Low levels of *Basidiospores* and *Cladosporium* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of this genus in this location.

Sample ID: A9

Sample Location: Hallway Outside A038

Low levels of *Myxomycetes* and *Pithomyces* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of this genus in this location.

Sample ID: A10

Sample Location: Classroom B22

Low levels of *Ascospores*, *Basidiospores*, and *Cladosporium* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Air-O-Cell Sampling Results – September 26, 2023

Sample ID: A12

Sample Location: Stair W1

Low levels of *Ascospores* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A13

Sample Location: Classroom W22

Low levels of *Ascospores* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A14

Sample Location: Library

Low levels of *Ascospores* and *Pithomyces* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A15 **Sample Location: Auditorium**

Low levels of *Ascospores* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A16 **Sample Location: Gymnasium**

Low levels of *Ascospores*, *Basidiospores*, and *Pithomyces* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A17 **Sample Location: 2nd Floor – Blue Wing Girls Bathroom**

Low levels of *Ascospores* and *Basidiospores* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A18 **Sample Location: Stair R2**

Low levels of *Ascospores* and *Basidiospores* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A19 **Sample Location: Stair B2**

Low levels of *Ascospores* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of this genus in this location.

Sample ID: A20 **Sample Location: Main Office**

Low levels of *Ascospores*, *Basidiospores*, and *Pithomyces* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Air-O-Cell Sampling Results – September 27, 2023

Sample ID: A31 **Sample Location: Custodians Office**

Low levels of *Basidiospores* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A32 **Sample Location: 2nd Floor – White Wing Classroom W21**

Low levels of *Ascospores* and *Basidiospores* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A33 **Sample Location: 1st Floor – Green Wing Hallway**

Levels slightly higher than baseline of *Stachybotrys* were present in this sample. Spore counts and volumes indicated a source of fungal amplification of this genus in this location.

Low levels of *Ascospores*, *Cladosporium*, *Myxomycetes*, and *Pithomyces* were also present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A34 **Sample Location: 2nd Floor – Blue Wing Classroom B28**

Low levels of *Ascospores* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of this genus in this location.

Sample ID: A35 **Sample Location: 1st Floor – Cafe/Gym Wing, Cardio Room**

Low levels of *Basidiospores* and *Cladosporium* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A36 **Sample Location: 1st Floor – Black Wing Art Room 037**

Low levels of *Ascospores*, *Myxomycetes*, and *Pithomyces* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A37 **Sample Location: 2nd Floor – Red Wing Room R22**

Low levels of *Ascospores* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of this genus in this location.

Sample ID: A38 **Sample Location: 1st Floor – Yellow Wing Hallway**

Low levels of *Ascospores*, *Curvularia*, *Epicoccum*, *Myxomycetes*, *Pithomyces*, and *Rusts/Smuts* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Sample ID: A39

Sample Location: 1st Floor – Gym/Café Wing, Café Lounge

Low levels of *Bipolaris*/*Drechslera*, *Myxomycetes*, and *Pithomyces* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Air-O-Cell Sampling Results – November 7, 2023

Sample ID: A4

Sample Location: Green Wing Hallway

Low levels of *Ascospores*, and *Cladosporium* were present in this sample. Spore counts and volumes were low and did not indicate a source of fungal amplification of these genera in this location.

Conclusions From September 25th- September 27th, 2023

- The indoor temperature throughout the school was generally within the recommended ASHRAE standard range at the time of the assessment.
- The relative humidity throughout the school was generally slightly above the recommended range of the referenced ASHRAE standard for relative humidity at the time of the assessment.
- The concentration of Carbon Dioxide was below the OSHA PEL of 5,000 ppm throughout the building indicating that all levels of CO₂ measured were below the OSHA PEL. The average CO₂ concentration for the three days was between 571 ppm and 1108 ppm, indicating acceptable building ventilation.
- Dust concentrations were well below the respirable and total PELs of 5 mg/m³ and 15 mg/m³, respectively, throughout the building indicating no active dust amplification was detected.
- VOC concentrations were generally below the referenced LEED standard of 500 ppb with some exceedances being slightly above the recommended standard of 500 ppb.
- The detected formaldehyde concentrations were well below the OSHA PEL of 0.75 ppm.
- Slightly elevated levels of *Stachybotrys* were detected in the 1st Floor Green Wing Hallway on September 27, 2023.
 - *Stachybotrys* spores can produce potent mycotoxins that can suppress the immune system of immunocompromised and susceptible individuals.
- Airborne fungal amplification was not detected in any other location tested on September 25 throughout September 27, 2023.

Recommendations

EnviroMed Services identified a source of airborne fungal amplification of the toxigenic mold *Stachybotrys* in the 1st Floor Green Wing Hallway of the school.

EnviroMed Services recommends that a professional remediation contractor clean all cleanable nonporous surfaces with a disinfecting agent such as Fiberlock ShockWave or equivalent in the affected area of the 1st Floor Green Wing Hallway of the school. In addition, EnviroMed recommends the use of an air scrubbing system to remove all airborne spores. We recommend the use of a HEPA (High-Efficiency Particulate Air) vacuum. Prior to cleaning, a Negative Air Pressure Containment setup will be required to prevent the contamination of any airborne mold spores during the remediation process. Containment air to be exhausted outside containment area during remediation. The HEPA Sandwich method (vacuum/ clean/ vacuum) is recommended with the continued use of an industrial HEPA Air Unit for at least 24 hours' post abatement work to further clean the air.

Following the cleaning, EnviroMed recommends a follow-up microbial assessment be performed by a professional industrial hygienist to verify the effectiveness of the cleaning.

EnviroMed Services did not identify any sources of fungal amplifications in any of the remaining areas tested throughout the school during the three (3) days of testing.

In addition, indoor air quality parameters were generally acceptable besides some slight exceedances of relative humidity and volatile organic compounds during the three (3) days of testing. As a proactive measure, temperate conditions and proper ventilation should be maintained throughout the building at all times.

Based on the results and observations made during the indoor air quality testing on November 7, 2023, at John F. Kennedy Middle School, EnviroMed Services, Inc. has come to the following conclusions and recommendations.

Conclusions From November 7th, 2023

- On September 27, 2023, slightly high levels of *Stachybotrys* were detected in the 1st Floor Green Wing Hallway.
 - *Stachybotrys* spores can produce potent mycotoxins that can suppress the immune system of immunocompromised and susceptible individuals.
- On November 7, 2023, the airborne spore trap results inside the Green Wing Hallway were overall similar to those levels and types of molds found in the outside air from the baselines.

Recommendations

There were no longer sources of fungal amplification or active mold growth in the Green Wing Hallway at John F. Kennedy Middle School. This hallway is fit for occupancy as there was no other evidence of mold contamination or presence of toxigenic mold.

II. TABLE OF IAQ MEASUREMENTS

IAQ Readings taken on September 25, 2023

Location	Temp. (°F)	RH (%)	CO (ppm)	CO ₂ (ppm)	CH ₂ O (ppm)	VOC (ppm)	Dust Conc. (mg/m ³)
Outdoor Baseline	60.5	79.8	0.7	545	0.0	0.000	0.021
Main Office	63.3	82.1	0.0	786	0.0	0.113	0.014
Green Wing Hallway	66.6	73.2	0.7	857	0.0	0.127	0.014
Classroom D354	68.7	67.4	0.7	1080	0.0	0.187	0.013
Classroom H112	69.9	64.9	0.9	735	0.0	0.128	0.008
Classroom H118	71.0	64.9	0.9	761	0.0	0.115	0.008
Workroom B123	70.2	56.7	0.9	641	0.0	0.175	0.008
Classroom B012	69.8	59.6	0.8	603	0.0	0.147	0.015
1 st Floor Blue Wing Hall	69.6	59.3	0.7	796	0.0	0.145	0.012
Classroom B13	70.6	59.0	0.8	628	0.0	0.153	0.006
Cafeteria	69.1	67.8	0.7	649	0.0	0.123	0.021
Classroom Y206	70.0	58.8	0.7	627	0.0	0.221	0.010
Gym/Café Wing Hallway	70.2	64.3	0.8	655	0.0	0.147	0.018
Gymnasium	69.8	65.3	0.7	750	0.0	0.151	0.020
Auditorium	68.6	68.1	0.8	574	0.0	0.133	0.005
1 st Floor Black Wing Hall	69.7	69.9	0.8	995	0.0	0.162	0.007
Practice Room A035	71.5	67.8	0.7	683	0.0	0.199	0.009
Art Room A041	70.7	64.3	0.7	584	0.0	0.212	0.009
1 st Floor Red Wing Hall	70.1	66.2	0.8	720	0.0	0.237	0.013
Classroom R15	70.0	65.8	0.7	592	0.0	0.304	0.009
Classroom R17	69.9	66.2	0.8	732	0.0	0.258	0.011
Stair R1 First Floor	70.2	66.5	0.8	746	0.0	0.271	0.013
Room 408	70.8	63.6	0.7	741	0.0	0.293	0.018
Media Center	69.6	65.3	0.8	679	0.0	0.273	0.013
1 st Floor Yellow Wing Hall	68.7	68.1	0.9	847	0.0	0.297	0.011
Room H125	69.8	67.9	0.7	832	0.0	0.301	0.015
1 st Floor White Wing Hall	70.0	67.8	0.8	785	0.0	0.283	0.012
Classroom W14	70.6	66.5	0.7	631	0.0	0.283	0.010
2 nd Floor White Wing Hall	71.1	64.3	0.9	724	0.0	0.369	0.013
Stair W2, 2 nd Floor	71.1	61.5	0.8	677	0.0	0.388	0.012
Classroom W24	70.8	61.6	1.0	678	0.0	0.361	0.010
2 nd Floor Red Wing Hallway	71.1	62.4	0.7	870	0.0	0.409	0.011
Classroom R22	71.0	60.8	0.7	740	0.0	0.404	0.010

Location	Temp. (°F)	RH (%)	CO (ppm)	CO ₂ (ppm)	CH ₂ O (ppm)	VOC (ppm)	Dust Conc. (mg/m ³)
Classroom R25	71.3	60.5	0.7	776	0.0	0.431	0.009
2 nd Floor Blue Hallway	71.2	64.7	0.7	753	0.0	0.381	0.006
Classroom B22	71.2	63.2	0.9	686	0.0	0.375	0.006
Classroom B27	70.3	63.7	0.8	600	0.0	0.380	0.005
Outdoor Baseline	64.3	80.2	0.8	557	0.0	0.001	0.032
Main Office	70.5	66.6	0.7	1026	0.0	0.277	0.007
Green Wing Hall	70.6	65.0	0.9	876	0.0	0.295	0.009
Classroom D354	70.6	64.2	0.7	923	0.0	0.277	0.008
Classroom H112	70.4	63.5	0.9	731	0.0	0.210	0.007
Classroom H118	71.3	63.6	0.7	697	0.0	0.180	0.006
Workroom B123	71.2	54.5	0.7	626	0.0	0.264	0.007
Classroom B13	71.0	58.8	0.7	666	0.0	0.245	0.008
Cafeteria	70.9	58.8	0.8	720	0.0	0.241	0.007
Classroom Y206	69.7	62.7	0.8	615	0.0	0.226	0.005
Gym/café Wing Hallway	68.4	68.1	0.8	645	0.0	0.216	0.006
Gymnasium	68.6	67.2	0.8	761	0.0	0.238	0.004
Auditorium	67.4	68.4	0.8	588	0.0	0.215	0.007
1 st Floor Black Wing Hall	68.5	67.8	0.7	650	0.0	0.244	0.006
Practice Room A035	68.8	67.0	0.8	616	0.0	0.262	0.006
Art Room A041	69.0	67.1	0.7	683	0.0	0.270	0.007
1 st Floor Red Wing Hall	70.4	66.1	0.7	766	0.0	0.298	0.012
Classroom R15	69.9	66.7	1.0	973	0.0	0.331	0.019
Classroom R17	70.5	65.5	0.7	734	0.0	0.294	0.010
Stair R1 1 st Floor	69.9	68.2	0.8	1056	0.0	0.293	0.028
Room 408	71.5	62.9	0.7	738	0.0	0.342	0.006
Media Center	71.4	62.3	0.8	804	0.0	0.342	0.012
1 st Floor Yellow Wing Hall	71.8	62.5	0.8	770	0.0	0.338	0.013
Room H125	70.8	63.6	0.8	694	0.0	0.343	0.016
1 st Floor White Wing Hall	71.0	66.3	0.7	807	0.0	0.317	0.012
Classroom W14	71.2	66.2	0.8	751	0.0	0.314	0.008
2 nd Floor White Wing Hall	71.9	65.7	0.8	864	0.0	0.333	0.007
Stair W2. 2 nd Floor	72.2	64.5	0.9	932	0.0	0.341	0.010
Classroom W24	72.2	64.3	1.0	746	0.0	0.334	0.008
2 nd Floor Red Wing Hall	70.8	66.6	0.7	1060	0.0	0.323	0.015
Classroom R22	71.1	65.7	0.8	691	0.0	0.321	0.015
Classroom R25	71.5	65.3	0.8	931	0.0	0.337	0.012
2 nd Floor Blue Hall	72.4	58.2	0.7	862	0.0	0.324	0.006

Location	Temp. (°F)	RH (%)	CO (ppm)	CO₂ (ppm)	CH₂O (ppm)	VOC (ppm)	Dust Conc. (mg/m³)
Classroom B22	70.8	59.9	0.7	890	0.0	0.275	0.007
Classroom B27	73.7	58.0	0.8	690	0.0	0.325	0.007

IAQ Readings taken on September 26, 2023

Location	Temp. (°F)	RH (%)	CO (ppm)	CO₂ (ppm)	CH₂O (ppm)	VOC (ppm)	Dust Conc. (mg/m³)
Outdoor Baseline	61.3	76.2	0.7	536	0.0	0.000	0.033
Stair W1	64.4	77.3	0.5	724	0.0	0.039	0.008
Classroom W14	68.0	70.1	0.6	860	0.0	0.065	0.008
Classroom W12	68.5	67.2	0.7	709	0.0	0.069	0.008
1 st Floor White Wing Hall	68.7	66.0	0.8	670	0.0	0.074	0.008
Classroom W22	69.7	63.1	0.8	599	0.0	0.114	0.007
2 nd Floor White Wing Hall	70.7	63.7	0.8	824	0.0	0.127	0.006
Hallway Near Stair W2	71.9	60.9	0.9	857	0.0	0.153	0.009
Library	70.3	60.7	0.7	702	0.0	0.054	0.008
Classroom G417	69.0	64.4	0.6	684	0.0	0.025	0.015
Yellow Wing Hall	70.0	64.6	0.7	880	0.0	0.058	0.019
Classroom G409	69.4	61.1	0.7	645	0.0	0.056	0.003
R103	70.7	63.9	0.8	1088	0.0	0.094	0.019
1 st Floor Red Wing Hall	70.4	61.5	0.7	820	0.0	0.092	0.006
Classroom R15	70.3	61.2	0.8	906	0.0	0.101	0.004
1 st Floor Stair R2	69.6	63.1	0.8	912	0.0	0.141	0.007
2 nd Floor Stair R2	70.5	63.5	0.7	853	0.0	0.215	0.008
Classroom R25	71.5	60.2	0.7	733	0.0	0.222	0.003
2 nd Floor Red Wing Hall	71.5	60.6	0.7	843	0.0	0.218	0.006
Classroom A038	71.6	58.9	0.7	625	0.0	0.274	0.003
Music Room A031	70.2	62.3	0.9	919	0.0	0.254	0.006
Black Wing Hall	70.2	62.9	0.7	871	0.0	0.257	0.007
Auditorium	69.0	60.8	0.7	557	0.0	0.212	0.001
Gymnasium	67.7	66.1	0.7	756	0.0	0.238	0.003
Cafeteria	68.2	64.6	0.7	894	0.0	0.281	0.004
Hallway Across from Y204	68.6	62.8	0.7	648	0.0	0.282	0.007
Classroom Y203	69.2	57.9	0.7	760	0.0	0.330	0.004
Blue House Office B119	69.3	58.4	0.7	814	0.0	0.382	0.007
1 st Floor Stair B2	70.0	59.5	0.7	743	0.0	0.348	0.006
Classroom B16	71.1	61.0	0.7	1075	0.0	0.345	0.008
1 st Floor Blue Wing Hall	71.0	56.1	0.7	842	0.0	0.404	0.025
Classroom B22	71.4	56.3	0.7	660	0.0	0.393	0.004
Blue Wing 2 nd Fl. Girls BR	71.4	56.7	0.7	846	0.0	0.398	0.026

Location	Temp. (°F)	RH (%)	CO (ppm)	CO ₂ (ppm)	CH ₂ O (ppm)	VOC (ppm)	Dust Conc. (mg/m ³)
2 nd Floor Blue Wing Hall	71.0	56.1	0.7	674	0.0	0.390	0.005
Green Wing Hall	70.2	57.9	0.8	975	0.0	0.431	0.012
Room D302	70.9	60.5	0.7	1083	0.0	0.482	0.007
Main Entry Way	70.8	59.8	0.7	912	0.0	0.512	0.014
Main Office	71.0	60.4	0.7	919	0.0	0.537	0.017
Lab H012	70.4	61.0	0.7	1220	0.0	0.447	0.023
Outdoor Baseline	62.5	75.3	0.6	542	0.0	0.016	0.001
Stair W1	70.6	59.3	0.7	768	0.0	0.041	0.005
Classroom W14	70.8	59.9	0.7	852	0.0	0.098	0.006
Classroom W12	69.7	60.2	0.7	830	0.0	0.113	0.008
1 st Floor White Wing Hall	78.7	56.8	0.8	810	0.0	0.146	0.017
Classroom W22	72.4	57.2	0.7	835	0.0	0.163	0.006
2 nd Floor White Wing Hall	71.1	59.8	0.7	916	0.0	0.154	0.008
Hallway Near Stair W2	71.8	57.7	0.7	718	0.0	0.129	0.007
Library	70.0	62.4	0.7	896	0.0	0.398	0.004
Classroom G417	67.4	64.4	0.7	872	0.0	0.278	0.009
Yellow Wing Hall	68.4	59.3	0.7	799	0.0	0.234	0.010
Classroom G409	67.2	61.9	0.7	857	0.0	0.251	0.006
R103	67.7	63.3	0.7	784	0.0	0.127	0.017
1 st Floor Red Wing Hall	68.4	61.8	0.7	855	0.0	0.130	0.005
Classroom R15	68.9	60.6	0.8	697	0.0	0.099	0.005
1 st Floor Stair R2	68.9	61.5	0.8	829	0.0	0.123	0.009
2 nd Floor Stair R1	71.0	58.4	0.7	819	0.0	0.164	0.006
Classroom R25	71.4	57.2	0.7	782	0.0	0.138	0.004
2 nd Floor Red Wing Hall	72.0	58.5	0.8	966	0.0	0.142	0.006
Classroom A038	70.9	61.7	0.7	812	0.0	0.365	0.006
Music Room A031	68.7	62.8	0.8	715	0.0	0.328	0.005
Black Wing Hallway	68.2	63.1	0.7	653	0.0	0.311	0.004
Auditorium	67.2	61.4	0.7	630	0.0	0.255	0.002
Gymnasium	68.7	65.2	0.6	961	0.0	0.271	0.022
Cafeteria	68.0	64.9	0.7	703	0.0	0.308	0.004
Hallway Across From Y204	68.1	63.3	0.7	674	0.0	0.319	0.006
Classroom Y203	68.2	63.2	0.7	787	0.0	0.382	0.012
Blue House Office B119	69.0	57.5	0.7	744	0.0	0.397	0.003
1 st Floor Stair B2	69.9	60.2	0.7	880	0.0	0.381	0.007
Classroom B16	69.3	59.0	0.7	662	0.0	0.386	0.008

Location	Temp. (°F)	RH (%)	CO (ppm)	CO₂ (ppm)	CH₂O (ppm)	VOC (ppm)	Dust Conc. (mg/m³)
1 st Floor Blue Wing Hall	69.1	59.2	0.7	708	0.0	0.399	0.006
Classroom B22	70.5	59.3	0.8	915	0.0	0.412	0.004
Blue Wing 2 nd Fl Girls BR	70.8	57.9	0.7	824	0.0	0.429	0.007
2 nd Floor Blue Wing Hall	71.2	57.8	0.7	836	0.0	0.396	0.005
Green Wing Hall	69.4	58.5	0.7	968	0.0	0.457	0.015
Room D302	70.1	61.3	0.7	1090	0.0	0.480	0.004
Main Entry Way	70.6	59.9	0.7	917	0.0	0.529	0.009
Main Office	70.9	60.2	0.7	866	0.0	0.554	0.014
Lab H012	69.8	56.0	0.9	920	0.0	0.633	0.005

IAQ Readings taken on September 27, 2023

Location	Temp. (°F)	RH (%)	CO (ppm)	CO₂ (ppm)	CH₂O (ppm)	VOC (ppm)	Dust Conc. (mg/m³)
Custodians Office	66.5	63.5	0.6	685	0.0	0.122	-
Yellow Wing - Hallway	68.7	60.3	0.7	963	0.0	0.164	-
Yellow Wing G408	69.8	56.6	0.7	780	0.0	0.137	-
Yellow Wing G411	69.6	55.0	0.8	782	0.0	0.125	-
Yellow Wing – Library	70.2	66.7	0.7	1105	0.0	0.175	-
1 st Fl. White Wing W14	72.7	54.3	0.7	850	0.0	0.146	-
1 st Fl. White Wing W18	73.1	51.2	0.7	717	0.0	0.167	-
1 st Fl. White Wing Hall	71.6	52.6	0.7	857	0.0	0.196	-
2 nd Fl. White Wing W21	71.7	52.7	0.7	726	0.0	0.171	-
2 nd Fl. White Wing Hall	71.8	53.1	0.7	825	0.0	0.184	-
2 nd Fl. White Wing W24	72.0	52.1	0.7	728	0.0	0.208	-
1 st Fl. Green Wing Hall	71.8	53.7	0.7	905	0.0	0.299	-
1 st Fl. Green Wing Outside Classroom D354	71.2	54.9	0.7	894	0.0	0.333	-
1 st Fl. Green Wing Office	71.0	57.7	0.7	1015	0.0	0.425	-
1 st Fl. Blue Wing B123 Workroom	70.2	55.2	0.7	713	0.0	0.292	-
1 st Fl. Blue Wing Hall	70.4	55.6	0.7	770	0.0	0.306	-
1 st Fl. Blue Wing Stair B1	69.0	56.6	0.8	725	0.0	0.206	-
2 nd Fl. Blue Wing B28	73.5	52.2	0.7	675	0.0	0.397	-
2 nd Fl. Blue Wing Stairwell	72.5	50.4	0.9	742	0.0	0.294	-
2 nd Fl. Blue Wing Hall	71.5	52.8	0.7	755	0.0	0.311	-
1 st Fl. Café/Gym Wing – Room Y203	70.2	53.4	0.8	653	0.0	0.291	-
1 st Fl. Cafe/gym Wing – Cardio Room 217	70.7	53.0	0.7	584	0.0	0.261	-
1 st Fl. Cafe/Gym Wing – Cafeteria	70.4	52.3	0.8	572	0.0	0.279	-
1 st Fl. Café/Gym Wing – Gym (Court 1)	69.8	53.2	0.8	798	0.0	0.306	-
1 st Fl. Café/Gym Wing – Gym/Café Foyer	69.8	54.9	0.7	600	0.0	0.269	-
1 st Fl. Café/Gym Wing Auditorium	69.3	53.9	0.7	580	0.0	0.253	-
1 st Fl. Black Wing Hall	68.9	57.6	0.7	764	0.0	0.297	-
1 st Fl. Black Wing Room A037 – Art Room	69.6	57.0	0.7	702	0.0	0.302	-
1 st Fl. Black Wing Room A038 – Art Room	70.0	62.2	0.8	626	0.0	0.318	-
1 st Fl. Red Wing Hall	70.5	55.1	0.7	886	0.0	0.379	-

Location	Temp. (°F)	RH (%)	CO (ppm)	CO ₂ (ppm)	CH ₂ O (ppm)	VOC (ppm)	Dust Conc. (mg/m ³)
1 st Fl. Classroom R15	70.2	54.5	0.7	830	0.0	0.363	-
1 st Fl. Red Wing Stair R2	69.6	55.2	0.7	841	0.0	0.415	-
2 nd Fl. Room R22	70.9	54.1	0.7	800	0.0	0.365	-
2 nd Fl. Room R25	71.4	53.0	0.7	774	0.0	0.446	-
2 nd Fl. Red Wing Hall	71.7	54.1	0.7	926	0.0	0.405	-
Custodians Office	70.4	55.8	0.7	660	0.0	0.148	0.004
1 st Fl. Yellow Wing Hall	70.4	56.0	0.8	898	0.0	0.217	0.007
Yellow Wing Room G408	70.8	55.6	0.7	1004	0.0	0.244	0.007
Yellow Wing G411	70.9	57.1	0.7	1044	0.0	0.220	0.010
Yellow Wing, Library	70.4	57.2	0.7	1026	0.0	0.246	0.011
1 st Fl. White Wing Rm. W14	69.0	58.1	0.7	794	0.0	0.247	0.003
1 st Fl. White Wing Rm. W18	69.9	55.8	0.6	621	0.0	0.249	0.006
1 st Floor white Wing Hall	69.8	54.0	0.7	660	0.0	0.250	0.008
2 nd Fl. White Wing Rm. W24	71.2	55.8	0.7	826	0.0	0.261	0.005
2 nd Floor White Wing Hall	70.6	54.0	0.7	715	0.0	0.272	0.008
2 nd Fl. White Wing Rm. W21	71.5	54.8	0.7	838	0.0	0.275	0.005
1 st Fl. Green Wing Hall	70.4	54.6	0.8	929	0.0	0.325	0.009
1 st Fl. Green Wing Office	70.6	57.4	0.7	848	0.0	0.420	0.018
1 st Fl. Office – Outside D354	70.2	56.0	0.8	929	0.0	0.379	0.007
1 st Fl. Blue Wing Rm. B123	67.1	53.0	0.7	701	0.0	0.325	0.008
1 st Fl. Blue Wing Stair B1	69.0	56.6	0.7	725	0.0	0.314	0.002
1 st Fl. Blue Wing Hall	68.6	55.2	0.7	649	0.0	0.303	0.013
2 nd Fl. Blue Wing Hall	69.5	55.4	0.7	873	0.0	0.304	0.004
2 nd Fl. Blue Wing Rm. B28	70.7	52.8	0.5	579	0.0	0.324	0.002
2 nd Fl. Blue Wing Stair B2	69.7	53.3	0.7	657	0.0	0.308	0.005
1 st Fl. Gym/Café Wing Y203	68.8	51.7	0.7	587	0.0	0.324	0.003
1 st Fl. Cafe/gym Wing – Cardio Room 217	70.6	48.1	0.6	555	0.0	0.312	0.003
1 st Fl. Cafe/Gym Wing – Cafeteria	71.0	50.0	0.7	557	0.0	0.296	0.006
1 st Fl. Café/Gym Wing – Gym (Court 1)	69.2	53.2	0.7	735	0.0	0.316	0.002
1 st Fl. Café/Gym Wing – Gym/Café Foyer	67.9	54.1	0.6	627	0.0	0.296	0.001
1 st Fl. Black Wing Room A037 – Art Room	68.5	52.4	0.4	596	0.0	0.321	0.003
1 st Fl. Black Wing Room A038 – Art Room	69.5	49.7	0.6	609	0.0	0.321	0.002

Location	Temp. (°F)	RH (%)	CO (ppm)	CO ₂ (ppm)	CH ₂ O (ppm)	VOC (ppm)	Dust Conc. (mg/m ³)
1 st Fl. Red Wing Hall	68.1	50.7	0.7	619	0.0	0.354	0.003
1 st Fl. Red Wing Classroom R15	67.5	49.2	0.8	595	0.0	0.387	0.004
1 st Floor Red Wing Stair R2	67.7	51.8	0.7	677	0.0	0.381	0.006
2 nd Floor Red Wing Rm. R22	68.1	51.1	0.7	753	0.0	0.372	0.004
2 nd Fl. Red Wing Rm. R25	67.5	48.5	0.7	668	0.0	0.366	0.003
2 nd Fl. Red Wing Hall	68.3	50.0	0.7	717	0.0	0.368	0.004
1 st Fl. Rm. H101	68.8	49.1	0.6	586	0.0	0.353	0.002
1 st Fl. Hall Outside H116	67.8	52.6	0.7	676	0.0	0.367	0.013
1 st Fl. Class H118	67.9	51.2	0.7	597	0.0	0.351	0.003
1 st Fl. Rm. H102	68.1	49.7	0.7	584	0.0	0.341	0.002
Outside	49.9	80.2	0.0	572	0.0	0	0.000

III. PHOTOGRAPHS

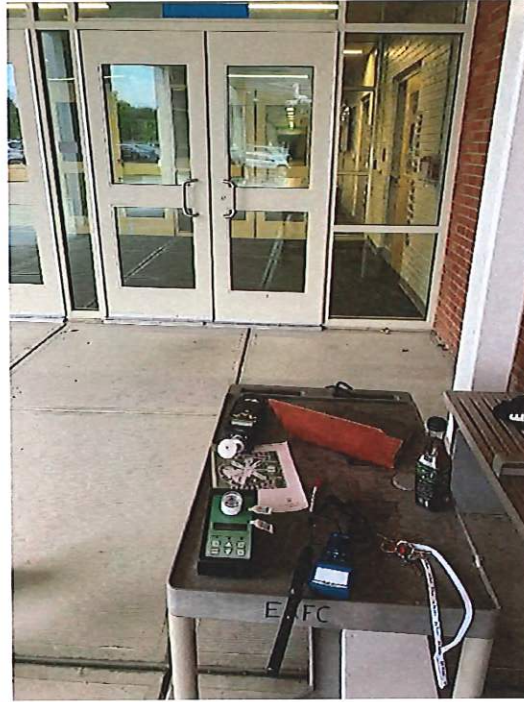


Figure 1. Location of Air Sample A1 – Outdoor Baseline



Figure 2. Location of Air Sample A2 – Green Wing Hallway



Figure 3. Location of Air Sample A4 – Classroom B13



Figure 4. Location of Air Sample A5 – Cafeteria



Figure 5. Location of Air Sample A7 – Room H123



Figure 6. Location of Air Sample A8 – Classroom W24



Figure 7. Location of Air Sample A9 – Hallway outside Art Room A038

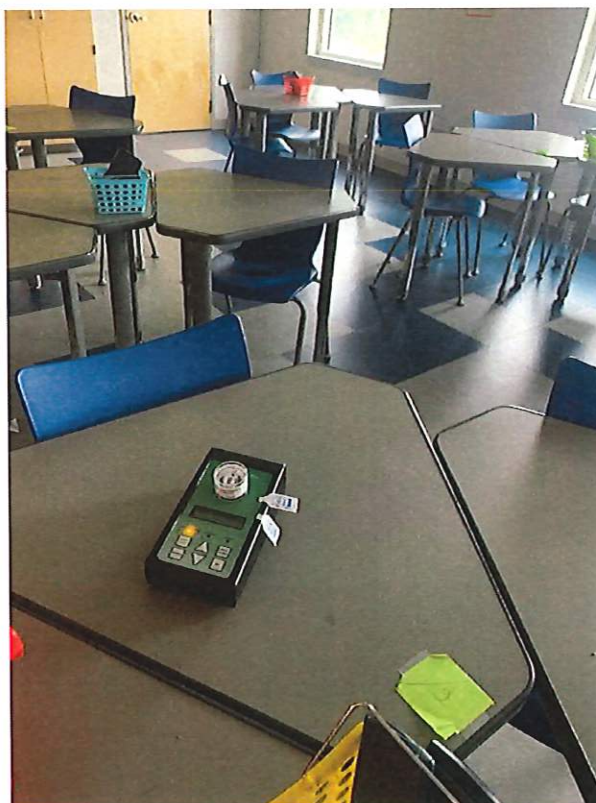


Figure 8. Location of Air Sample A10 – Classroom B22



Figure 9. Location of Air Sample A11 – Outdoor Baseline



Figure 10. Location of Air Sample A12 – Stair W1

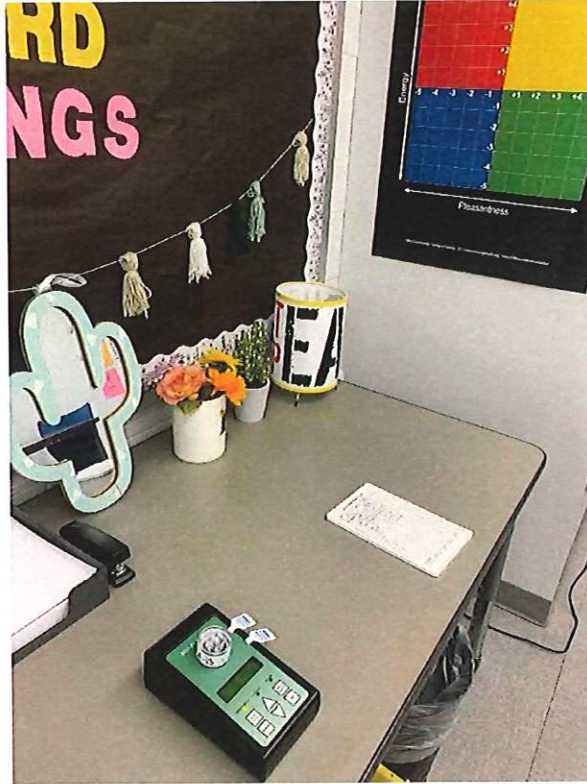


Figure 11. Location of Air Sample A13 – Classroom W22

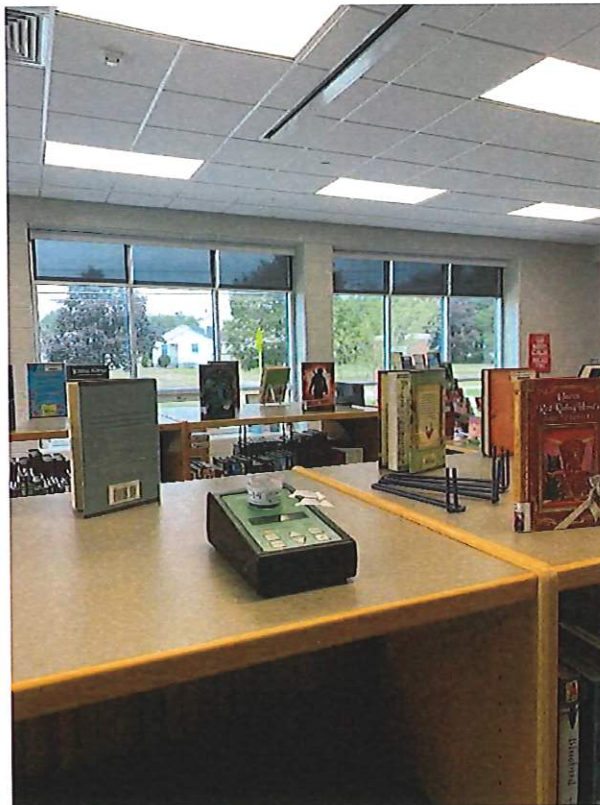


Figure 12. Location of Air Sample A14 – Library

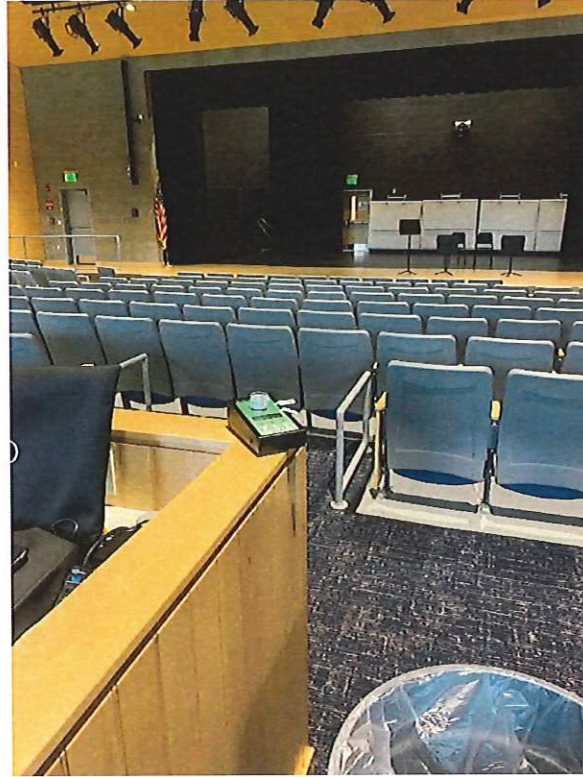


Figure 13. Location of Air Sample A15 – Auditorium

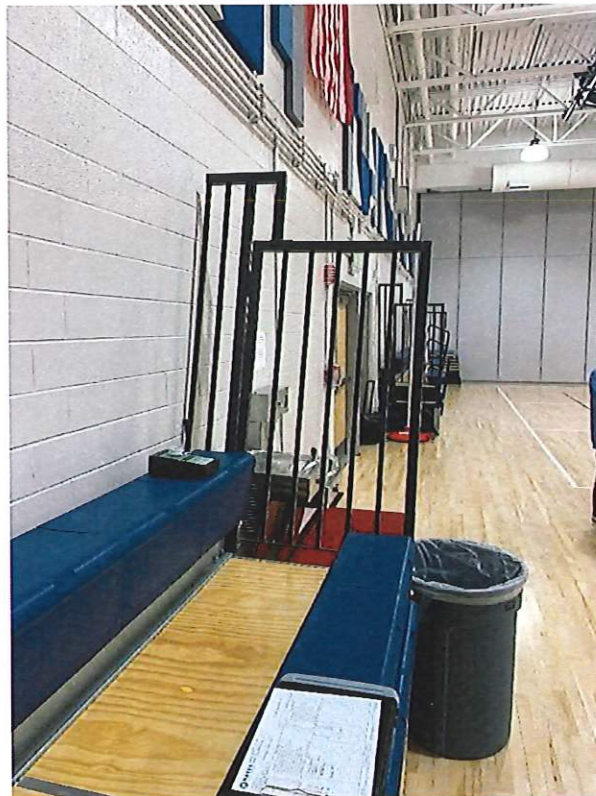


Figure 14. Location of Air Sample A16 – Gym



Figure 15. Location of Air Sample A17 – 2nd Floor Blue Wing Girl’s Bathroom



Figure 16. Location of Air Sample A18 – Stair R2



Figure 17. Location of Air Sample A19 – Stair B2

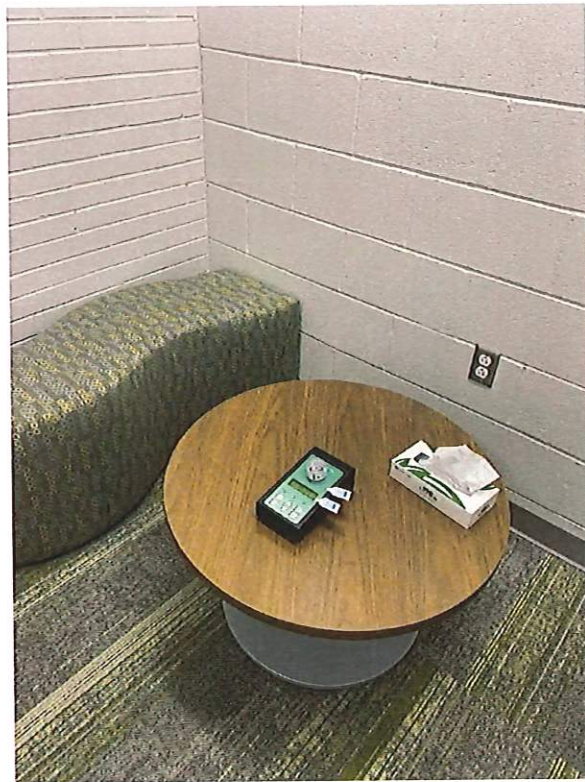


Figure 18. Location of Air Sample A20 – Main Office



Figure 19. Location of Air Sample 30 – Exterior Baseline

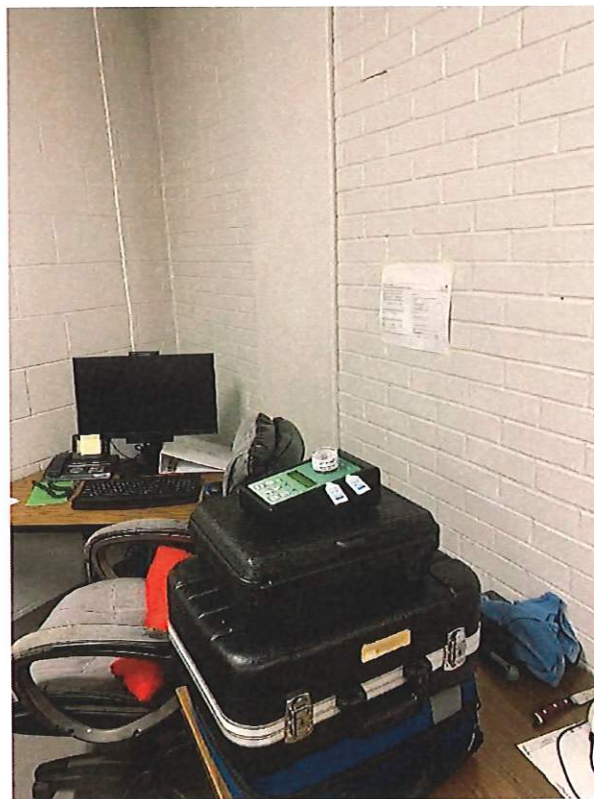


Figure 20. Location of Air Sample A31 – Custodian's Office



Figure 21. Location of Air Sample A32 – White Wing Classroom W21



Figure 22. Location of Air Sample A33 – 1st Floor Green Wing Hallway



Figure 23. Location of Air Sample A34 – 2nd Floor Blue Wing Classroom B28

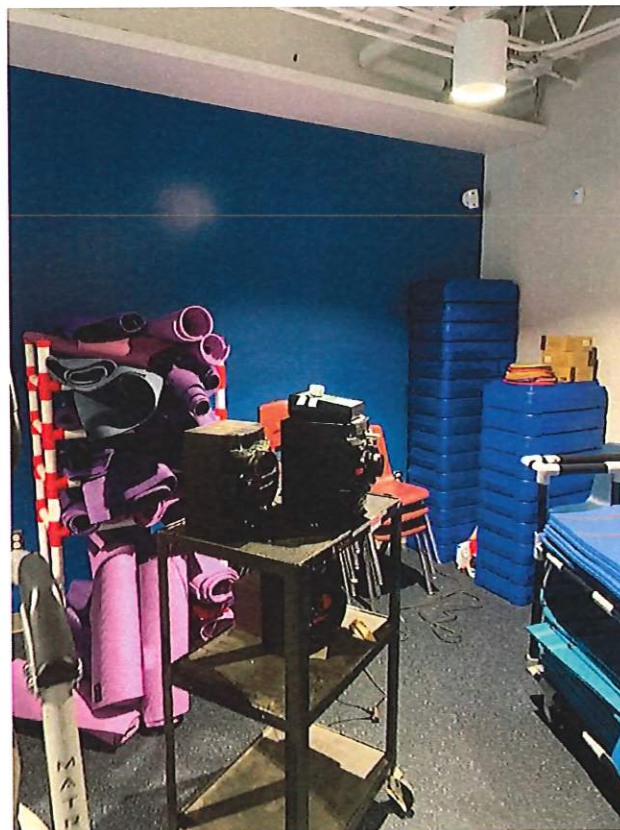


Figure 24. Location of Air Sample A35 – Cardio Room



Figure 25. Location of Air Sample A36 – Art Room A037

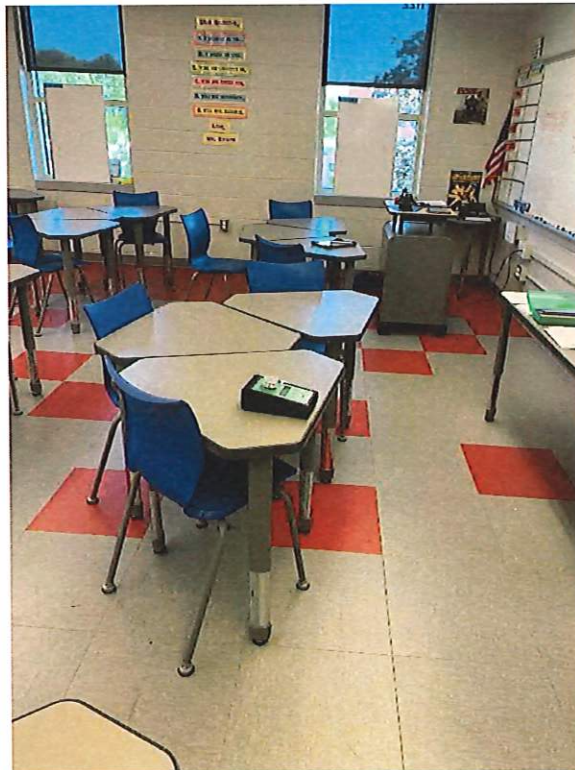
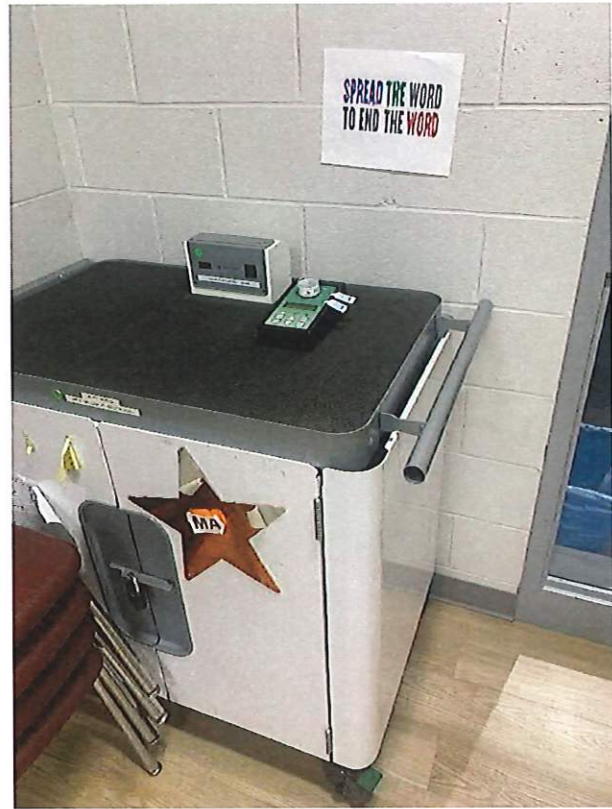


Figure 26. Location of Air Sample A37 – Classroom R22



*Figure 27. Location of Air Sample
A38 – 1st Floor Yellow Wing Hallway*



*Figure 28. Location of Air Sample
A39 – 1st Floor Café/Lounge*



*Figure 29. Green Wing Hallway and location
of clearance sample A4. Figure from re-test
taken on November 7, 2023.*