# MOLD AND MOISTURE ASSESSMENT REPORT

ELIZABETH D. REDD ELEMENTARY SCHOOL

5601 JAHNKE ROAD
RICHMOND, VIRGINIA 23225

ECS PROJECT NO. 47:14153-D

FOR: RICHMOND PUBLIC SCHOOLS FACILITY SERVICES

FEBRUARY 26, 2024

February 26, 2024

Mr. Ronald Hathaway Jr.
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ECS Project No. 47:14153-D

Reference: Mold and Moisture Assessment, Elizabeth D. Redd Elementary School, 5601 Jahnke Road, Richmond, Virginia

Dear Mr. Hathaway Jr.:

ECS Mid-Atlantic, LLC (ECS) is pleased to provide Richmond Public Schools Facility Services with the results of the above referenced Mold and Moisture Assessment performed at Elizabeth D. Redd Elementary School located at 5601 Jahnke Road in Richmond, Virginia. This report summarizes our observations, analytical results, findings, and recommendations related to the work performed. The work described in this report was performed by ECS in general accordance with the Scope of Services described in ECS Proposal Number 47:30369-EP and the terms and conditions of the agreement authorizing those services.

ECS appreciates this opportunity to provide Richmond Public Schools Facility Services with our services. If we can be of further assistance to you, please do not hesitate to contact us.

Sincerely,

ECS Mid-Atlantic, LLC

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## 1.0 PROJECT DESCRIPTION

The building located at 5601 Jahnke Road in Richmond, Virginia is a two-story school building known as Elizabeth D. Redd Elementary School. The building contains approximately 74,471 square feet of space and was reportedly originally constructed in 1951.

Based on information provided by Richmond Public Schools Facility Services representatives, ECS understands that building occupants have reported mold and moisture concerns in the building to the Richmond Public Schools Facility Services Department. Richmond Public Schools Facility Services has requested ECS to conduct a Mold and Moisture Assessment to evaluate these concerns. In addition.

## 2.0 PURPOSE

The purpose of the Mold and Moisture Assessment was to conduct visual observations and testing for mold and moisture to identify evidence of moisture-affected building materials or selective amplification of mold within tested areas of the subject building.

## 3.0 METHODOLOGY

ECS performed the authorized Scope of Services in general accordance with our proposal, standard industry practices and methods specified by guidelines and industry standards for the identification of mold and moisture-affected building materials.

### 3.1 Mold and Moisture

The assessment included a non-invasive visual and olfactory survey for evidence of mold and moisture within the subject building. The assessments focused on the client-selected areas indicated by Richmond Public Schools Facility Services. The ECS site personnel observed readily accessible areas and selected building materials to evaluate visible suspect fungal growth and/or moisture impacted materials. A reasonable effort was made to identify water and mold impacted areas; however, this does not imply a guarantee that all possible reservoirs of mold were identified because mold or water-impacted building materials may be hidden by walls, flooring, partitions, etc. ECS observed two outbuildings behind the main school building. ECS did not assess these structures as part of the assessment as they were not requested to be included by the client. Additionally, ECS observed several crawlspace entrances around the school which were mechanically fastened closed so ECS could not access these areas.

Ambient temperature and relative humidity were measured during the survey using a Q-Trak hand held IAQ meter. The purpose of these measurements was to identify elevated interior humidity levels, which could potentially support indoor mold growth or indicate ongoing moisture problems.

ECS measured the moisture content in various building materials in multiple locations within the surveyed areas utilizing a Protimeter brand hand-held moisture meter. The instrument may be operated in two independent modes. The non-destructive “search mode” uses radio-frequency induction to detect moisture in a substrate. Using the search mode, the Protimeter is capable of detecting moisture in solid, homogeneous materials at depths up to 10 millimeters (0.39 inches). When operated in search mode, the Protimeter produces qualitative readings (“dry”, “at risk”, “wet”)

along with a relative numerical reading corresponding to the appropriate qualitative reading. The Protimeter may also be used in "measure mode" to obtain actual moisture percentage readings in wood and other solid, non-conductive materials. Measurements are taken by inserting the pins of a moisture probe into the material being tested. For wood substrates, the moisture percentage is expressed as "% Moisture Content (MC)"; for other materials this number is expressed as "% Wood Moisture Equivalent (WME)". In general, %MC or %WME values of less than 17 are considered "dry", values greater than or equal to 17 but less than 20 are considered "at risk" for moisture damage, and values of 20 or greater are considered "wet". Values of greater than 17 % typically are considered at risk for mold growth. This was not a comprehensive moisture mapping survey of all building materials within the areas surveyed but rather a non-invasive survey of moisture in select areas of specific building materials which may be impacted by moisture.

Fungal spore air samples were collected using calibrated self contained battery operated air sampling pumps and Allergenco® cassettes. Samples were transported to Environmental Hazards Services located in Richmond, Virginia for analysis. Environmental Hazards Services is accredited by the Environmental Microbiology Laboratory Accreditation Program, administered by the American Industrial Hygiene Association. Air samples were reported to the genus or group level according to the laboratory standard quantification procedures.

Direct samples were collected using pre-packaged tape lift slides used to sample a suspect surface or material. The samples were then placed back into the packaged sealed container for transport to the laboratory for analysis. Note: This is a semi-quantitative test and only indicative of the location sampled and primarily meant to identify the type of mold spores present and associated concentration from the sampled area only. The results may also present concentration ratings reported for hyphal fragments pollen, insect fragments, skin fragments, fibrous particulate, and background matter.

Samples collected were transported/shipped to Environmental Hazards Services (EHS) located in Richmond, Virginia for analysis. EHS is an AIHA (American Industrial Hygiene Association) EMLAP (Environmental Microbiology Laboratory Accreditation Program) accredited laboratory. The samples were analyzed for total spore concentrations in accordance to the laboratory's quantification methods.

It is important to note that fungal spore samples represent a snapshot in time of a constantly changing microbiome. Environmental conditions such as temperature and humidity may influence sample results. The goal of the sampling performed was not to establish precise numerical concentrations over time, but rather to generally identify the dominant fungi in the sampled locations and the general significance of their relative concentrations as compared to outdoor concentrations or unaffected locations.

## 4.0 RESULTS

The following is a summary of laboratory results, measurements, findings and observations.

Based on our observations and sampling data, ECS does not see any reason why the school should not be continued to be used based on our experience with similar school buildings across the Richmond area and our findings for this study. In general, our air sample results did not indicate any

significantly elevated spore trap air samples in the classrooms above outdoor comparison samples. As would be expected with any school building, new or old, areas of mold and moisture were observed and it is our understanding that the recommendations identified in the assessment reports are being addressed or will be addressed by Richmond Public Schools.

### 4.1 Mold and Moisture

**Main School Building**

- A heavy build-up of dust and dirt was observed associated with the wall mounted fan coil units on each of the classrooms beneath the units and within the supply vents on the top;
- Elevated moisture meter readings using a moisture meter were detected associated with the perimeter plaster walls in the majority of the classrooms, the cafeteria, 2nd floor offices, the hallways, the kitchen and the auditorium. Mold and moisture impacted plaster walls were also observed in the front corner of Room 101 behind the vertical pipes; ECS believes there are multiple active moisture sources impacting these walls;
- The plaster wall in the back corner of the kitchen (to the left of the exhaust hood) was tested with a moisture meter and indicated that plaster wall in this area was saturated/wet. The plaster wall was failing and plaster wall finish was beginning to delaminate from the wall, and debris was dropping on the food containers that were stored in this area; ECS believes there is an active moisture source impacting these walls;
- Moisture impacted plaster ceiling was observed in Room 218. Moisture meter readings indicated that the plaster ceiling was saturated at the time of the assessment indicating there may be an active source of moisture in this area;
- Elevated moisture meter readings and mold were observed associated with the fiberglass pipe insulation observed in many areas of the school where it was accessible. These areas include Rooms 101, 102, 107, 108, 111, the room beside 111, the library, the cafeteria, the auditorium, the teacher's lounge, and the basement mechanical room;
- Evidence of active water leaks were observed in the basement mechanical room where pipes were visibly leaking into overflowing (leak capture) containers causing standing water on the floor and water was also observed flowing out of holes in the foundation wall in the back of the mechanical room;
- Evidence of an active water leak was observed in the music room (126) from the Northwest corner of the room where the sealants were observed to be failing on the exterior wall. Water was present beneath the floor tiles and water damaged drywall was also observed in this area. Additionally mold was observed behind the vinyl cove baseboard in this area;
- Elevated moisture meter readings were identified associated with the bathroom floors (asbestos containing) in the majority of the ground floor classrooms, the nurse's office and the 2nd floor conference room. ECS believes that a potential cause for these elevations is that the toilet wax rings are failing;
- Mold was observed on floor tile at the base of the file cabinets in the nurse's office; The bottom of the metal file cabinets sitting on this flooring were visibly rusted. A source of moisture was not directly apparent;

- Moisture damaged ceiling tiles as well as rust and suspect mold staining on the ceiling HVAC supply vents were observed in Room 112, the Librarian's office, the main office and the Nurse's office. The suspect mold staining and rust on the HVAC supplyvents would appear to indicate that the HVAC system is not performing efficiently to remove moisture/humidity from the conditioned air;
- Mold was observed on the back of drywall and wall framing above the ceiling in the hallway leading to the library. Additionally, indications of moisture staining were observed on the original plaster ceiling that is enclosed above this area. The cause of water intrusion and the mold and moisture staining was apparently roof leaks. Moisture meter readings collected from these materials indicated that they were dry at the time of the assessment;
- Elevated moisture meter readings were observed associated with the plaster walls surrounding the pipe penetrations in the room beside Room 111;
- Mold and moisture impacted drywall was observed on a column and hallway opening in the library hallway during the site visit on October 18, 2023. During the next site visit on October 30, 2023 these areas had been repaired and new drywall was installed and finished. ECS recommends verification that the source of moisture intrusion that caused the initial impact observed by ECS in these areas has been properly corrected;
- Mold and moisture impacted plaster wall and ceiling were observed in Room 111 and the room beside Room 111 during the initial site visit on October 30, 2023. During the next site visit on October 30, 2023 these areas had been repaired and plaster was installed and finished. ECS recommends verification that the source of moisture intrusion that caused the initial impact observed by ECS in these areas has been properly corrected;
- Mold was observed within the bottom of the sink cabinet in Room 111. Moisture meter readings indicated that this materials was dry at the time of the survey. ECS was informed by a teacher that was present at the time of the assessment that a contractor had previously cut the water lines in this cabinet to perform a repair and the water lines leaked water into the cabinet and on to the carpeted floor for an extended period of time before it was shut off;
- Mold was observed on the wall beneath the windows in the library. Moisture meter readings collected from this area at the time of the survey indicated that the drywall was dry. Mold was observed on the main HVAC trunk line supplies above the middle of the library;
- Moisture and mold stained HVAC duct insulation and pipe insulation were observed associated with the HVAC equipment above the stage and to the right and left of the stage. Elevated moisture meter readings were observed associated with some of the pipe insulation in this area. However, the HVAC duct insulation tested dry at the time of the assessment.

**Pod Classrooms**

- Mold was observed on asbestos containing drywall at the entrance door into the pod classrooms from the pod connector hall. The drywall was concealed behind a wall covering material;
- Elevated moisture meter readings were observed associated with the tectum ceiling in the pod connector hallway. The tectum is apparently being impacted by a roof leak in this area where there is a roof transition;

- Elevated moisture meter readings were detected associated with the vinyl floor tiles in all the bathrooms directly outside of the classrooms, possible indicating that the toilet wax rings are failing;
- Mold was observed at the base of the plaster walls and on vinyl floor tiles in the janitor's closet; the apparent cause of the mold in this area appears to be either the pipes leaking or poor housekeeping and accumulation of water from mopping, cleaning activities etc.;
- Mold was observed on stored materials within the storage closets adjacent to the janitor's closet;
- Mold was observed on the ceiling tiles that surround the large HVAC supply ducts in the middle of the ceiling in all of the classrooms. Mold was also observed on the back of the supply ducts. The apparent cause is accumulation of moisture/elevated relative humidity within the back of the HVAC supply duct that is trapped by the ceiling tiles above it.

**Exterior Envelope**

- The window frames throughout the school were observed to be significantly rusted and damaged. The asbestos containing window caulk and window glazing throughout the school was also observed to be failing which is letting moisture into the building. The stone window ledges throughout the school were observed to be significantly damaged and cracked and entire portions of the window ledges were missing in some areas. This is likely one of the primary sources of moisture intrusion that is impacting the plaster walls around the windows throughout the school;
- The exterior sealants associated with the black metal wall panels were observed to be failing; These were observed on the exterior of the activities portion of the building and the library. This is likely the cause of the active water leaks and mold impacted drywall observed in the music room and the mold impacted drywall in the library;
- Multiple small holes were observed on the exterior metal wall panels on the exterior of the Activities portion of the building which appears to be a source of water intrusion in this area;
- A storm water drain in the courtyard between the Activities portion of the building and the cafeteria is clogged so it cannot manage storm water runoff in this area; Water appears to be backing up and flowing against the building during heavy rain events.
- Several drains and downspouts on the North and East side of the building are draining against the foundation potentially causing moisture intrusion into the building or the building crawlspace;
- Several downspouts are draining against the foundation of the pod classroom instead of flowing into a nearby storm water drain, potentially causing water infiltration into the pod classrooms;
- A gutter on the East side of the pod connector hall has rusted through and is allowing water to drain on and against the building, apparently the cause for elevated moisture readings detected in the tectum ceiling in the pod connector hallway;
- Exterior wood wall panels on the pod classrooms are damaged potentially causing water intrusion;
- A portion of the soffit on the North side of the pod classrooms was observed to be damaged and ECS measured elevated moisture meter readings on interior walls/ceilings in this area, indicating that moisture is penetrating the building envelope in this location.

### 4.1.1 Spore-Trap Air Samples

Fungal spore-trap air samples were collected from classrooms and functionally distinct spaces in the school where students and faculty would be expected to spend the most time.. Representative exterior samples were collected for comparison. The following table summarizes the results of sample analysis reported in spore counts per cubic meter of air.

**Spore-Trap Sample Results**

| Sample Number | Sample Location | Total Fungal Spore Concentration (count/cubic meter) |
|---|---|---|
| A1 | Outside | 2,600 |
| A2 | 101 | 1,100 |
| A3 | 102 | 830 |
| A4 | 103 | 130 |
| A5 | 104 | 170 |
| A6 | 105 | 290 |
| A7 | 106 | 240 |
| A8 | 107 | 2,000 |
| A9 | 108 | 1,000 |
| A10 | 109 | 770 |
| A11 | 110 | 390 |
| A12 | 111 | 460 |
| A13 | 111A | 610 |
| A14 | 112 | 210 |
| A15 | 113 | 370 |
| A16 | Library | 1,400 |
| A17 | Teachers Lounge | 1100 |
| A18 | Cafeteria | 490 |
| A19 | Outside | 2300 |
| A20 | Kitchen | 850 |
| A21 | Nurses Ofiice | 950 |
| A22 | Auditorium | 580 |

| Sample Number | Sample Location | Total Fungal Spore Concentration (count/cubic meter) |
|---|---|---|
| A23 | 214 | 210 |
| A24 | 215 | 780 |
| A25 | 216 | 570 |
| A26 | 217 | 480 |
| A27 | 218 | 210 |
| A28 | 219 | 1,500 |
| A29 | 2nd Fl. Office | 2,200 |
| A30 | 220 | 1,100 |
| A31 | 2nd Fl. Conf. room | 1,400 |
| A32 | 221 | 390 |
| A33 | 222 | 270 |
| A34 | 223 | 200 |
| A35 | 224 | 87 |
| A36 | Main Office | 250 |
| A37 | 124 | 370 |
| A38 | 125 | 73 |
| A39 | 126 | 13 |
| A40 | Outside | 1,600 |

The mold spore trap air samples results indicated that the total indoor spore counts were less than the spore counts identified on the outdoor samples. The spore trap air sample results indicated fairly minor elevations of individual fungal genera of mold spores including *Aspergillus/Penicillium* group spores in room 101 and the Nurse's office and *smuts, Periconia, myxomycetes* in rooms 107, 108, 219, 220, the 2nd floor teacher's office, the 2nd floor conference room and the library.

The apparent source of the elevations of individual fungal genera in rooms, 101, 107, 108 and the teacher's lounge was mold impacted pipe insulation wrap which also exhibited moisture staining and elevations in moisture in these areas. Additionally, in some of these rooms the areas behind and beneath the fan coil units exhibited heavy concentrations of dirt, dust and other debris that may be encouraging mold growth in these areas.

In the Nurse's office moisture staining and rusting was observed beneath the cot and file cabinets indicating a potential source of moisture or evidence of previous elevated relative humidity in the room. Mold was observed on the flooring in this area and may be concealed beneath or behind these fixtures which ECS could not access during the survey. Additionally, rusting and suspect mold staining was observed on the HVAC supply diffuser in the ceiling which also may be contributing to the elevation identified.

In the 2nd floor conference room bathroom the moisture levels in the floor(beneath the vinyl floor tile) was significantly elevated indicating a source of mold may be present concealed beneath this flooring. ECS also detected elevations in mold air samples in this general area of the 2nd floor.

ECS also observed mold on the main HVAC trunk line and HVAC supply diffusers in the library vents; Mold was observed on the perimeter walls beneath the windows in the library likely contributing to the minor individual elevation detected in the air sample collected in the library.

There are currently no accepted regulatory standards or guidelines with respect to acceptable fungal levels inside buildings. Generally total spore counts and fungal genera detected on spore trap samples collected on the interior should be comparable to and less then outdoor samples. It is important to note however that spore trap measurements can fluctuate rapidly and the readings reported should not be used as a definitive indication that mold and or health hazards related to mold are present or absent.

### 4.1.2 Direct Surface Fungi Samples

Surface tape-lift samples were collected inside classroom 224 and the library. Sample locations were selected from areas suspected to have fungal spore concentrations present due to water staining on building materials, visible mold growth, or other observations made by ECS indicative of possible fungal spore growth. The following table summarizes the results of sample analysis. The laboratory reports the results in accordance with the following density rating:

- Occasional: 1-5 spores seen per cover slip, growth not likely
- Few: Over 5 spores seen per cover slip, but less than 1 spore seen in 5 fields:, possible indication of growth
- Moderate: At least 1 spore seen in 5 fields, probable indication of growth
- Numerous Several spores seen in every field, indication of growth
- N/A: Not applicable

**Direct Surface Fungi Samples**

| Sample Number | Sample Location | Type and Density Rating |
|---|---|---|
| T1 | Room 224 Behind Baseboard | Occasional: *smuts, Periconia, myxomycetes, rusts, Stachybotrys spores and hyphal elements, Curvularia spores*, *Drechlera/Bipolaris group spores* and pollen grains |
| T2 | Drywall Ceiling Around Light in Library Hallway | Occasional: pollen grains, *Ulocladium spores, Cladosporium spores, Nigrospora spores, Stachybotrys spores and* hyphal elements, *Curvularia spores, Epicoccum spores,* Few: *smuts, Periconia, myxomycetes, basidiospores, Penicillium/Aspergillus group spores,* hyphal elements*, Drechlera/Bipolaris group spores, Pithomyces spores, Pestalotia spores* |

The laboratory report indicates that mold spores are present in both locations sampled. While the concentrations identified by the tape lift sampling do not typically indicate active mold growth, the identification of *Stachybotrys spores* and hyphal elements in both locations is an indication that active mold growth was present at one time and that mold or moisture has been present in these locations for an extended period of time. ECS believes that the source of moisture in these locations is likely elevated indoor relative humidity during the cooling seasons. Since we are now in a heating season relative humidity levels have abated so the source of this moisture is not present. Other direct sources were not identified in these specific areas.

There are currently no accepted regulatory standards or guidelines with respect to acceptable fungal levels inside buildings. Surface samples are generally qualitative in that they reflect the type and quantity of mold present only at the sampled location at the time the sample was collected.

### 4.1.3 Moisture in Building Materials

The following table summarizes moisture content readings collected.

**Summary of Moisture Readings from Building Materials**

| Location | Building Component | Substrate Material | Moisture Content (%) |
|---|---|---|---|
| Room 101, Bathroom | Floor | Vinyl Floor Tile | 25.6 |
| Room 101 | Pipe Insulation | Fiberglass | 35.2 |
| Room 101 | Sink Cabinet | Wood | 28.1 |
| Room 102 | Pipe Insulation | Fiberglass | 48.5 |
| Room 102 | Wall | Plaster | 20.1 |
| Nurse's Office, Bathroom | Floor | Floor Tile | 24.8 |
| Teacher's Lounge | Pipe Insulation | Fiberglass | 26.8 |
| Room 111 | Wall | Plaster | 21.6 |
| Room 111 | Pipe Insulation | Fiberglass | 23.7 |
| Room 217 | Wall | Plaster | 31.9 |
| Room 218 | Wall | Plaster | 18.0 |
| Room 218 | Ceiling | Plaster | 100.0 |
| 2nd Floor Conference Room | Wall | Plaster | 21.3 |
| 2nd Floor Conference Room, Bathroom | Floor | Vinyl Floor Tile | 92.8 |
| Stage Left | Pipe Insulation | Fiberglass | 46.5 |
| Hallway Across from Room 110 | Wall | Plaster | 61.6 |
| Cafeteria | Wall | Plaster | 20.7 |
| Cafeteria | Pipe Insulation | Fiberglass | 100.0 |
| Kitchen | Wall | Plaster | 100.0 |
| Music Room | Floor | Floor Tile | 100.0 |
| Pod Connector Hall | Ceiling | Tectum | 25.6 |

Elevated moisture meter readings were detected associated with different materials throughout the school. During the assessment ECS identified elevated moisture meter readings associated with the following materials and areas:

- The plaster walls around the windows and behind the fan coil units in most classrooms, the cafeteria and the auditorium. The apparent cause of the moisture intrusion in these areas appears to be damaged stone window ledges, rusted window frames and failing window sealants;
- Pipe insulation in areas throughout the school including classrooms, the teacher's lounge, mechanical areas, and the cafeteria;
- Areas beneath the poured flooring and floor tiles in the classroom bathrooms and nurse's office on the first floor, classroom and conference room bathrooms on the 2nd floor;
- Plaster wall in the hallway across from Room 110;
- Beneath vinyl tile flooring in the Music room. At the time of the survey the area in the Southwest corner of the room was actively wet beneath the floor tiles;
- The wood sink cabinets in Rooms 101 and 108; this moisture appears to be from regular use of the sink and dripping onto the top of the sinks and possible leaking of the plumbing beneath the sink. It should be assumed that all the wood sink cabinets exhibit these conditions.

### 4.1.4 Temperature and Relative Humidity Humidity

The key to understanding humidity is that warmer air can contain greater quantities of moisture than cooler air. Relative humidity is defined as the ratio of the amount of moisture contained in the air to the maximum amount of moisture the air can contain at that temperature. The dew point temperature is defined as the temperature at which the amount of moisture in the air reaches saturation. The dew point is a more accurate indication of the actual amount of moisture in the air, because it is independent of temperature.

The American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE) has published several standards for ventilated buildings. *ANSI/ASHRAE Standard 62.1-2019, Ventilation for Acceptable Air Quality* specifies that indoor humidity should be maintained below 60 degrees Fahrenheit (°F) dew point temperature. The EPA recommends that indoor relative humidity be maintained below 60%, ideally 30-50%, to prevent mold growth. The *OSHA Technical Manual,* Section III, Chapter 2 for Indoor Air Quality Investigations specifies a thermal comfort range of 68°F to 76°F and a relative humidity range of 20% to 60% to maximize comfort for all occupants.

The following table summarizes the indoor air temperature and relative humidity readings collected by ECS during the survey.

The temperature and relative humidity readings collected during this assessment were considered normal and within recommended ranges.

**Temperature and Relative Humidity Readings**

| Location | Relative Humidity (%) | Temperature (°F) |
|---|---|---|
| Outdoors, main entrance | 43.0 | 68.9 |
| Admin office | 44.3 | 76.0 |

| Location | Relative Humidity (%) | Temperature (°F) |
|---|---|---|
| Teacher lounge | 44.5 | 75.7 |
| 101 | 48.7 | 74.5 |
| 102 | 49.7 | 73.0 |
| 103 (pod) | 44.9 | 70.7 |
| 104 (pod) | 50.9 | 71.9 |
| 105 (pod) | 46.6 | 72.4 |
| 106 (pod) | 47.2 | 72.7 |
| 107 | 51.8 | 71.5 |
| 108 | 51.5 | 71.8 |
| 109 | 51.5 | 71.9 |
| 110 | 53.0 | 72.0 |
| Pod central area | 49.3 | 71.4 |
| 111A | 48.2 | 72.6 |
| 112 | 45.3 | 74.1 |
| 113 | 48.1 | 72.1 |
| 111B | 46.3 | 73.4 |
| Library | 46.8 | 73.4 |
| Auditorium | 47.4 | 71.1 |
| 124 | 48.4 | 71.5 |
| 125 | 47.1 | 72.9 |
| 126 | 46.7 | 73.2 |
| 214 | 48.9 | 72.6 |
| 215 | 50.6 | 72.2 |
| 216 | 53.0 | 72.0 |
| 217 | 50.6 | 71.6 |
| 218 | 52.6 | 71.1 |
| 219 | 50.6 | 71.8 |
| Office, second floor | 49.8 | 72.4 |
| 220 | 48.4 | 72.8 |

| Location | Relative Humidity (%) | Temperature (°F) |
|---|---|---|
| Conference room, 2nd floor | 50.2 | 72.9 |
| 221 | 51.1 | 73.1 |
| 222 | 49.9 | 72.9 |
| 223 | 48.6 | 73.4 |
| 224 | 48.7 | 73.9 |
| Cafeteria | 46.5 | 72.0 |
| Kitchen | 42.3 | 70.0 |
| Nurses | 49.7 | 73.3 |
| Outdoors, main entrance | 45.6 | 69.7 |

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

Based on our understanding of the purpose of the Mold and Moisture Assessment, the results of laboratory analysis, and our findings and observations, ECS presents the following recommendations.

### 5.1 Mold and Moisture

ECS recommends remediation be performed for all water and mold impacted materials within the surveyed areas as soon as reasonably possible. This includes all materials that have visible suspected mold and/or have been subjected to elevated moisture conditions for greater than 48 hours without proper drying efforts.

General

ECS recommends that a qualified mold remediation/drying contractor be retained to properly remove mold impacted materials. Remediation activities should be performed in general accordance with the guidelines described in EPA's March 2001 document "Mold Remediation in Schools and Commercial Buildings" and under the OSHA 2010 Guidelines for mold removal. Additional remedial guidance documents are also referenced in Section at the end of this report. Workers performing this work should wear proper personal protective equipment (PPE) including HEPA filtered respirators and disposable clothing (per OSHA standards for PPE).

Due to the complexity of the project, ECS recommends that the remediation contractor, the owner, and ECS meet on-site to review the project in order to review and discuss the scope of work.

**ECS recommends that a building envelope study be perfumed for the building by a qualified engineer. Correction of building envelope and water intrusion issues should be performed prior to or concurrent with any remediation activities.**

Setup

In general accordance with the EPA and OSHA guidelines, ECS recommends containment of the remediation areas using plastic barriers and tape to create negative pressure containment during removal of mold impacted materials. The contractor should seal HVAC vents in the work area(s), as well as all other penetrations and openings. A HEPA-filtered local exhaust ventilation (negative air machine) should be utilized within the work area directly adjacent to the area(s) being cleaned and should maintain negative pressure and HEPA filtration continuously inside the containment during remediation activities and prior to clearance sampling. [If greater than 100 square feet, or an occupied area adjacent to 30 square feet or more: A manometer should be used to measure the pressure difference between the remediation area and adjacent areas. The target pressure differential in the containment should be -0.02 inches of water gauge.

Scope of Work

All impacted drywall materials that have visible growth and/or have sustained water impacts should be removed in excess of 2 feet beyond the visible extent of mold or water stains where feasible. Further observation of the wall and ceiling systems may be necessary during remediation efforts to determine if additional materials will need to be removed. **As noted previously, any active moisture leaks into the building should be properly accessed and corrected prior to or concurrent with mold remediation activities. In addition, prior to performing any work the remediation contractor shall review all asbestos reports for the school building.**

ECS makes the following recommendations concerning abatement of mold and/or moisture impacted materials in the building:

- Assessment of the building envelope by a qualified building sciences engineer to determine if the windows and surrounding structure throughout the building should be removed and replaced or can be repaired in order to properly seal the building envelope and prevent further moisture intrusion. The envelope assessment should include an assessment of the integrity of the roof throughout the building as well;
- Perform aggressive drying of the perimeter plaster walls around windows in the areas identified throughout the school. This includes but is not limited to all classrooms and offices on the 1st and 2nd floor of the main building, the North/South hallways on the 1st and 2nd floors, the cafeteria and the auditorium. The drying may include use of dehumidifiers and or desiccant dryers. Once all the affected areas are verified to be dry with the use of a moisture meter have a qualified building sciences engineer assess the integrity of the plaster walls to determine if they can be properly repaired or if removal and replacement of the walls or a portion of the walls is necessary; Perform any mold remediation as described in this protocol, above this section;
- The plaster wall in the kitchen in the container storage area should be removed and the wall cavity should be inspected for the presence of additional moisture impacted or mold impacted materials within the wall cavity; Perform any mold remediation as described in this protocol, above this section;
- Verify that the source of water intrusion which caused the moisture damage to the drywall in the library hallway and the plaster walls and ceilings in Room 111 and the room beside Room 111 has been corrected since these areas were repaired between the 10-18-23 and 10-30-23 site visits performed by ECS;

- Perform aggressive drying of the significantly moisture impacted plaster ceiling in Room 218. Once the affected area has been verified to be dry with the use of a moisture meter have a qualified building sciences engineer assess the integrity of the plaster ceiling to determine if it can be properly repaired or if removal and replacement of the impacted portion of the ceiling is necessary. Properly assess the ceiling cavity or roof above this area to determine if the source of water intrusion has been corrected. Perform any mold remediation as described in this protocol, above this section;
- Remove all moisture stained and mold impacted fiberglass pipe insulation in all areas of the school where it was identified. This includes but is not limited to Rooms 101, 102, 107, 108, 111, the room beside Room 111, the library, the cafeteria, the auditorium, the teacher's lounge and the basement mechanical room. Once the pipes are exposed, have the appropriate qualified contractor or qualified maintenance staff assess the plumbing/piping to determine if it needs to be repaired or replaced and then re-insulate the remediated pipe systems. Perform drying of the plaster wall around the pipe penetrations in the room beside Room 111 in conjunction with removal of the mold and moisture impacted pipe insulation. If drying this material is not feasible then remove and re-install the moisture impacted portion of the plaster wall and pipe penetration packings in this area; Perform any mold remediation as described in this protocol, above this section;
- Have a qualified mechanical contractor or qualified maintenance staff assess the mechanical systems throughout the basement boiler room to determine if the systems are operating properly and determine the cause of the observed leaking of piping and repair or replace as necessary. Once the systems have been properly repaired or replaced perform drying throughout the boiler room to eliminate the water that has accumulated in this area. Determine and correct the source of moisture observed coming from holes in the back wall of the boiler room and perform drying of any materials in the boiler room or area behind this wall that may have been moisture impacted. Perform any mold remediation as described in this protocol, above this section;
- Remove and replace the mold and moisture impacted drywall and moisture impacted flooring in the Southwest corner of the Music Room (Room 126). Based on asbestos sampling results in other areas of the school the drywall and joint compound should be assumed to be asbestos containing. The red floor tile and associated mastic in this area was determined to not contain asbestos. Perform any mold remediation as described in this protocol, above this section;
- Remove and inspect and replace as necessary the toilet wax rings associated with the toilets throughout the first floor classrooms, the 2nd floor conference room and the Nurse's office. Perform aggressive drying of the poured and vinyl tile floors in all of these areas prior to re-installation of any new finishes or re-installation of the toilet fixtures. If the areas cannot be dried then removal of the flooring and drying of the sub-floor will be required. The flooring in the 2nd floor conference room bathroom should be removed and the sub-floor properly dried based on the high moisture levels detected in this area. Based on the asbestos sampling results of flooring in other areas of the school this flooring and mastic should be assumed to be asbestos containing. Perform any mold remediation as described in this protocol, above this section;

- Determine and correct the cause of the rust observed at the base of the file cabinets and the cot in the Nurse's office. Remove the file cabinets and inspect the walls behind this area for the presence of moisture or mold impacted building materials. Properly clean any mold identified in this area and the mold observed on the floor tiles beneath this area; Perform any mold remediation as described in this protocol, above this section;
- Remove and replace the moisture impacted ceiling tiles identified in the building. Clean or replace the rusted and suspect mold stained HVAC supply diffusers identified in the building; Perform any mold remediation as described in this protocol, above this section;
- Clean the inside of the mold impacted sink cabinet in Room 111 and apply an anti-microbial sealer; Perform any mold remediation as described in this protocol, above this section;
- Remove and replace the mold and moisture impacted drywall beneath the window on the perimeter wall of the library. Clean the HVAC supply vents on the main trunk line above the library and perform further inspection within the main trunk line in the area to determine if mold is present within the duct itself and clean if necessary; Perform any mold remediation as described in this protocol, above this section;
- Remove and replace the damaged and moisture/mold impacted HVAC duct board insulation above stage right and stage left in the auditorium; Perform any mold remediation as described further in this section.
- Conduct an inspection of the HVAC systems and fan coil units that service the building and also a review of the maintenance and service schedules by a qualified HVAC contractor or qualified maintenance staff to determine if the systems are properly performing per the manufacturer's recommended specifications.

**Pod Classrooms**

- Remove and replace the mold impacted drywall and joint compound wall at the entrance to the pod classrooms in the pod connector hallway. This drywall and joint compound was determined to be an asbestos containing material so this material will need to be abated by a licensed asbestos abatement contractor as part of any remediation. Perform any mold remediation as described in this protocol, above this section.
- Perform drying of the tectum ceiling identified in the pod connector hallway;
- Remove and replace the toilet wax rings in the bathrooms throughout and perform drying of the flooring in these areas prior to re-installation of the toilet fixtures. If drying is not feasible then remove and replace the flooring in these areas and dry the concrete slab or other sub-floor beneath prior to installing new flooring finishes. Perform any mold remediation as described in this protocol, above this section;
- Clean the mold impacted plaster walls and flooring in the janitor's closet and adjacent storage closets and apply an anti-microbial sealer to the cleaned areas. Perform any mold remediation as described in this protocol, above this section;
- Remove and replace the mold and moisture impacted ceiling tiles surrounding the large HVAC supply vents and clean the backs of the vents where evidence of mold and moisture accumulation is present throughout the classrooms. Identify and correct the source of moisture that is causing the mold on the ceiling tiles. The ceiling tiles throughout the classrooms were identified as Regulated Asbestos Containing Material (RACM) so they will need to be abated by a licensed asbestos abatement contractor as part of any remediation. Perform any mold remediation as described in this protocol, above this section.

**Exterior Envelope**

- Assessment of the exterior envelope of the main building and pod classrooms by a qualified building envelope engineer to assess the windows and surrounding structure, the storm water and mechanical system drainage, the roof and the condition and performance of the exterior metal wall panel systems around the buildings, and the roof of the buildings; Provide recommendations for corrective action;
- Repair or replace the metal wall panels with holes on the exterior of the Activities portion of the building;
- Repair of the damaged gutter on the roof of the pod connector hall causing the water intrusion that is impacting the tectum ceiling in this area;
- Repair or replacement of the exterior wood wall panels and repair of the damaged portion of soffit associated with the pod classrooms.

Following remediation/removal of mold-impacted materials, ECS recommends that the contained areas of the building undergo a thorough cleaning following guidelines described in EPA's March 2001 document "Mold Remediation in Schools and Commercial Buildings." Surface remediation should include HEPA vacuuming of vertical and horizontal surfaces and a clean-wipe with a mild detergent. The surfaces should not be saturated and discard cleaning cloths. All areas (affected and unaffected) should be left dry, visibly free from contamination and debris prior to build back activities.

Although not accessible during the survey, ECS is concerned that underlying structural materials (CMU walls, wood framing, poured concrete, etc…) contain excess moisture which will need to be thoroughly dried prior to installation of new materials. Where elevated moisture is still present in building materials, mechanical drying efforts should be performed. The use of portable dehumidifiers should be implemented immediately. Following removal of mold-affected materials and fine cleaning, the fans should also be utilized to accelerate drying efforts. For large areas with significant moisture load, the use of desiccant dehumidification systems should be considered.

Follow-up

Prior to removal of the containment barriers, a post-remediation survey and testing should be performed to assess the remediation efforts. Visible suspect mold and moisture-affected porous materials should not be present in the work area (although ECS recognizes that some semi-porous materials may still have stains present following cleaning). The moisture content of materials that have been dried or cleaned and will remain should be confirmed to be below recommended guidelines prior to re-construction of new materials. The indoor relative humidity in and around the work area should be below 60%. If the temperature in the work area is above 80°F, the indoor dew point should be below 65°F.

Air sampling should be performed by fungal spore trap method to document mold levels following remediation efforts. Surface sampling may also be performed to assess visible debris or staining remaining in the work area. The results of air sampling should find air samples in and adjacent to the work area to be less than concurrent outdoor samples, and the indoor samples will not find a prevalence of certain fungi considered likely indoor contaminants as determined by rank-order analysis. ECS notes that outdoor concentrations may be suppressed during the winter, and may utilize other references to compare with the indoor sample results on the day of the sampling.

Note: The purpose of this survey was to evaluate areas where moisture intrusion or suspected visible mold growth has occurred and provide findings and recommendations for remedial work efforts. Identification and recommendations for correction of sources of moisture should be performed by a qualified engineer. Because of the nature of the environment, complete elimination of all microbial organisms within a building cannot be expected and is not the goal of remediation. The goal of remediation is to restore the affected materials to at least the condition of unaffected materials. It is important to note that the reported mold levels are only reflective of conditions at the time of this test and that mold populations can vary over time, depending upon a number of conditions, including environmental factors (i.e., temperature and relative humidity). If significant mold growth reappears, or if the occupants experience prolonged allergic-type health complaints, they should seek further investigation of the problem.

## 6.0 LIMITATIONS

The conclusions and recommendations presented within this report are based upon a reasonable level of assessment within normal bounds and standards of professional practice for a site in this particular geographic setting. ECS is not responsible or liable for the discovery and elimination of hazards that may potentially cause damage, accidents, or injuries.

During this study, samples were submitted for analysis at an accredited laboratory via polarized light microscopy. As with any similar survey of this nature, actual conditions exist only at the precise locations from which samples were collected. Certain inferences are based on the results of this sampling and related testing to form a professional opinion of conditions in areas beyond those from which the samples were collected. No warranty, expressed or implied, is made.

This survey is not intended to represent an exhaustive research of every potential hazard or condition that may exist, nor does it claim to represent indoor conditions or events that arise after the survey. This report has been prepared in accordance with generally accepted environmental practices. Our conclusions and findings are based, in part, upon information provided to us by others and our site observations. We have not verified the completeness or accuracy of the information provided by others. The scope of services performed was limited to those requested by the Client and does not constitute a full microbial assessment of the site or a comprehensive moisture survey of the site. The data provided in this study is only indicative of conditions sampled at the immediate time of the study.

The work performed in conjunction with this assessment and the data developed is intended as a description of available information at the dates and locations given. This report does not warrant against future operations or conditions, nor does it warrant against extant, or future, conditions of a type or at a location not investigated. Because of the nature of this type of work and the difficulties involved in conducting remediation work, ECS cannot guarantee that the methods or recommendations described in this report will eliminate all potential indoor air quality issues. Since performance of the remediation work is also beyond ECS scope of services, ECS also cannot be held responsible for the execution of the remediation work. The reported microbial levels are only reflective of conditions at the time of this test and that microbial populations can vary over time, depending upon a number of conditions, including environmental factors (i.e., temperature and relative humidity). The work performed in conjunction with this assessment and the data developed is intended as a description of available information at the dates and locations given.

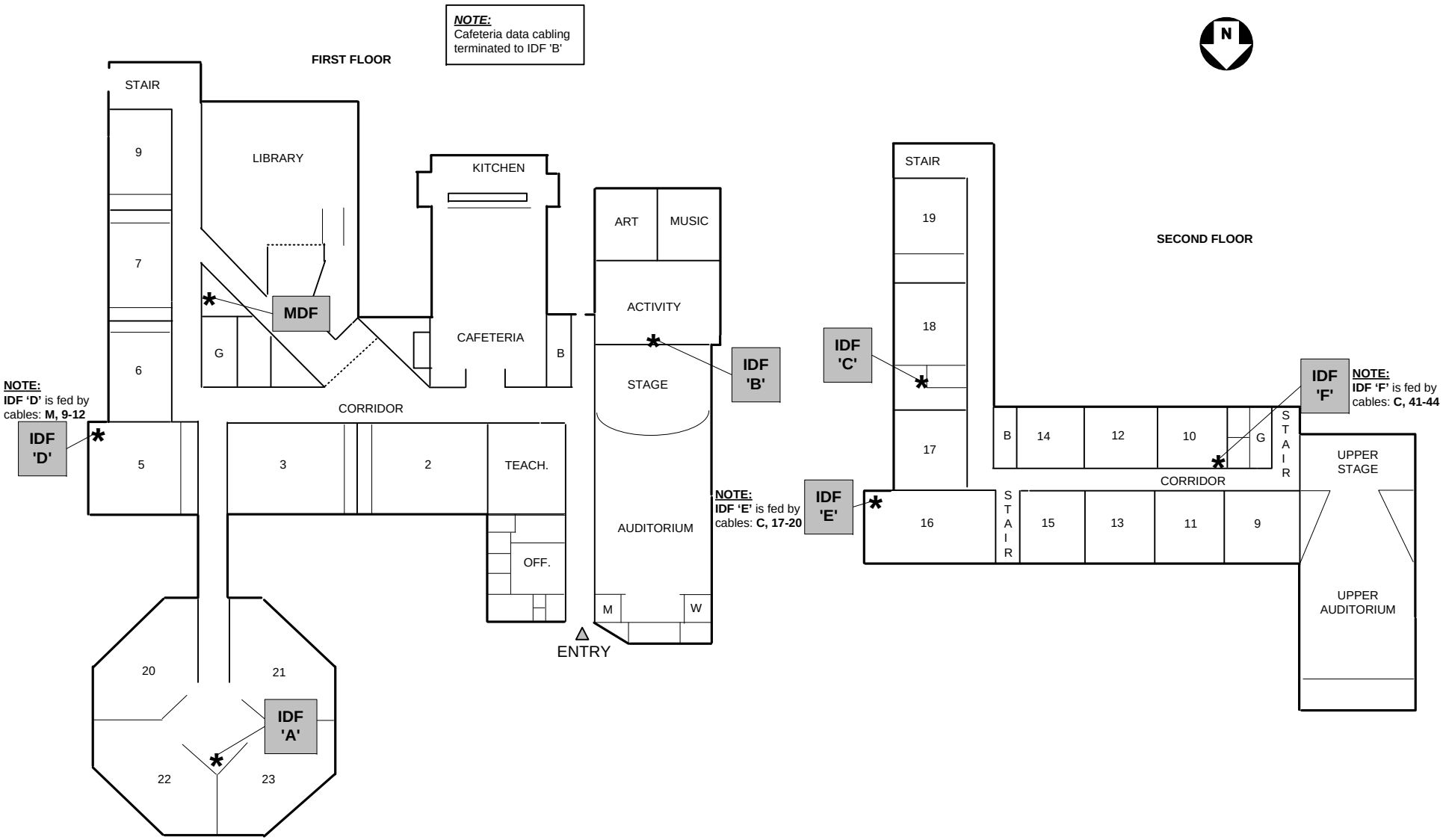
The observations, conclusions, and recommendations pertaining to environmental conditions at the subject site are necessarily limited to conditions observed, and/or materials reviewed at the time this study was undertaken. No warranty, expressed or implied, is made with regard to the conclusions and recommendations presented within this report. This report is provided for the exclusive use of the client. This report is not intended to be used or relied upon in connection with other projects or by other unidentified third parties without the written consent of ECS and the client.

Our recommendations are in part based on federal, state, and local regulations and guidelines. ECS does not assume the responsibility of the person(s) in charge of the site, or otherwise undertake responsibility for reporting to any local, state, or federal public agencies, any conditions at the site that may present a potential danger to public health, safety, or the environment. Under this scope of services, ECS assumes no responsibility regarding any response actions initiated as a result of these findings. General compliance with regulations and response actions are the sole responsibility of the Client and should be conducted in accordance with local, state, and/or federal requirements.

# Appendix I: School Diagram

# RICHMOND PUBLIC SCHOOLS
# DATA SYSTEMS CONNECTIONS AND FLOOR PLAN LAYOUT

## REDD ELEMENTARY SCHOOL




Prepared Nov. 6, 1997
Updated: August 19, 2008
File Name: REDD DATA SYS. LAYOUT RE-DRAW 08192008.vsd

# Appendix II: Mold Laboratory Report(s)

# Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

**Report Number:** 23-10-02953

**Received Date:** 10/19/2023
**Analyzed Date:** 10/25/2023
**Reported Date:** 10/26/2023

**Client:** ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

**Project/Test Address:** Elizabeth Redd Elementary; 5601 Jahnke Road; Richmond, Virginia

**Client Number:**
200625

**Fax Number:**
804-353-9478

## Laboratory Results

| Lab # : | 23-10-02953-001 | | 23-10-02953-002 | | 23-10-02953-003 | | 23-10-02953-004 | | 23-10-02953-005 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Client Sample ID :** | A27 | | A28 | | A29 | | A30 | | A31 | |
| **Date Collected :** | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | |
| **Collection Location :** | 218 | | 219 | | 2ND FLOOR OFFICE | | 220 | | 2ND FLOOR CONFERENCE ROOM | |
| **Sampling Media :** | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | |
| **Analytical Sensitivity (spores/m3) :** | 6.7 | | 6.7 | | 6.7 | | 6.7 | | 6.7 | |
| **Volume (L) :** | 150 | | 150 | | 150 | | 150 | | 150 | |
| **Spore ID** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** |
| Cladosporium spores | 19 | 130 | 129 | 860 | 239 | 1600 | 69 | 460 | 29 | 190 |
| Penicillium/Aspergillus group spores | 2 | 13 | 3 | 20 | 8 | 53 | 5 | 33 | 10 | 67 |
| Drechslera/Bipolaris group spores | | | | | 1 | 6.7 | | | 1 | 6.7 |
| Curvularia spores | | | | | 2 | 13 | 1 | 6.7 | 5 | 33 |
| Pithomyces spores | | | | | 1 | 6.7 | | | 1 | 6.7 |
| Spegazzinia spores | | | | | | | | | 1 | 6.7 |
| smuts, Periconia, myxomycetes | 10 | 67 | 91 | 610 | 74 | 490 | 84 | 560 | 162 | 1100 |
| **TOTAL SPORES(Spores/m3)** | | **210** | | **1500** | | **2200** | | **1100** | | **1400** |
| **Analyst:** | Kathy Fletcher | | Kathy Fletcher | | Kathy Fletcher | | Kathy Fletcher | | Kathy Fletcher | |

# Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

**Report Number:** 23-10-02953

**Received Date:** 10/19/2023
**Analyzed Date:** 10/25/2023
**Reported Date:** 10/26/2023

**Client:** ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

**Project/Test Address:** Elizabeth Redd Elementary; 5601 Jahnke Road; Richmond, Virginia

**Client Number:**
200625

**Fax Number:**
804-353-9478

## Laboratory Results

| **Lab # :** | 23-10-02953-006 | | 23-10-02953-007 | | 23-10-02953-008 | | 23-10-02953-009 | | 23-10-02953-010 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Client Sample ID :** | A32 | | A33 | | A34 | | A35 | | A36 | |
| **Date Collected :** | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | |
| **Collection Location :** | 221 | | 222 | | 223 | | 224 | | MAIN OFFICE | |
| **Sampling Media :** | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | |
| **Analytical Sensitivity (spores/m3) :** | 6.7 | | 6.7 | | 6.7 | | 6.7 | | 6.7 | |
| **Volume (L) :** | 150 | | 150 | | 150 | | 150 | | 150 | |
| **Spore ID** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** |
| Cladosporium spores | 39 | 260 | 11 | 73 | 6 | 40 | 5 | 33 | 7 | 47 |
| Penicillium/Aspergillus group spores | 13 | 87 | 7 | 47 | 17 | 110 | 2 | 13 | 6 | 40 |
| Drechslera/Bipolaris group spores | | | | | | | | | 1 | 6.7 |
| Curvularia spores | | | | | | | | | 2 | 13 |
| Pithomyces spores | | | | | | | | | 1 | 6.7 |
| smuts, Periconia, myxomycetes | 6 | 40 | 23 | 150 | 7 | 47 | 6 | 40 | 21 | 140 |
| **TOTAL SPORES(Spores/m3)** | | **390** | | **270** | | **200** | | **87** | | **250** |
| **Analyst:** | Kathy Fletcher | | Kathy Fletcher | | Kathy Fletcher | | Kathy Fletcher | | Kathy Fletcher | |

# Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

**Client:** ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

**Report Number:** 23-10-02953

**Received Date:** 10/19/2023
**Analyzed Date:** 10/25/2023
**Reported Date:** 10/26/2023

**Project/Test Address:** Elizabeth Redd Elementary; 5601 Jahnke Road; Richmond, Virginia

**Client Number:**
200625

**Fax Number:**
804-353-9478

## Laboratory Results

| **Lab # :** | 23-10-02953-011 | | 23-10-02953-012 | | 23-10-02953-013 | | 23-10-02953-014 | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Client Sample ID :** | A37 | | A38 | | A39 | | A40 | | | |
| **Date Collected :** | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | | |
| **Collection Location :** | 124 | | 125 | | 126 | | OUTSIDE | | | |
| **Sampling Media :** | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | | |
| **Analytical Sensitivity (spores/m3) :** | 6.7 | | 6.7 | | 6.7 | | 6.7 | | | |
| **Volume (L) :** | 150 | | 150 | | 150 | | 150 | | | |
| **Spore ID** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** |
| Cladosporium spores | 4 | 27 | 2 | 13 | 1 | 6.7 | 154 | 1000 | | |
| Penicillium/Aspergillus group spores | 9 | 60 | 4 | 27 | | | 21 | 140 | | |
| Alternaria spores | | | | | | | 3 | 20 | | |
| Drechslera/Bipolaris group spores | 2 | 13 | | | | | 2 | 13 | | |
| Arthrinium spores | | | | | | | 1 | 6.7 | | |
| Curvularia spores | 2 | 13 | 1 | 6.7 | | | 3 | 20 | | |
| Torula spores | | | | | | | 1 | 6.7 | | |
| Chaetomium spores | | | 1 | 6.7 | | | 2 | 13 | | |
| Pithomyces spores | 2 | 13 | | | 1 | 6.7 | | | | |
| Epicoccum spores | | | 1 | 6.7 | | | 5 | 33 | | |
| Cercospora spores | | | | | | | 2 | 13 | | |
| smuts, Periconia, myxomycetes | 37 | 250 | 2 | 13 | | | 43 | 290 | | |
| **TOTAL SPORES(Spores/m3)** | | **370** | | **73** | | **13** | | **1600** | | |
| **Analyst:** | Kathy Fletcher | | Kathy Fletcher | | Kathy Fletcher | | Kathy Fletcher | | | |

# Environmental Hazards Services, L.L.C

**Client Number:** 200625 **Report Number:** 23-10-02953

**Project/Test Address:** Elizabeth Redd Elementary; 5601 Jahnke Road; Richmond, Virginia

***Sample Narratives:***

(Sample 011) M02: Large amounts of particulate observed.

**Method:** Non-Culturable Spore Trap Examination

Reviewed By Authorized Signatory: Tasha Eaddy

*Tasha Eaddy*
QA/QC Clerk

# ENVIRONMENTAL HAZARDS SERVICES, LLC

## Mold Chain of Custody Form



| | | | |
|---|---|---|---|
| Company Name | ECS Mid-Atlantic | Account # | |
| Company Address | 2119 North Hamilton Street | City/State/Zip | Richmond/VA/23230 |
| Phone | 804-353-6333 | Email | rcurran@ecslimited.com |
| Project / Testing Address | Elizabeth Redd Elementary/5601 Jahnke Road, Richmond, Virginia | | |
| PO Number | 47:14153-D | Collected By | Rob Curran |
| Collection Date & Time | 10/18/23 | Outside Air Temp | Indoor Air Temp |
| Was there any precipitation (rain, sleet or snow) 2 hours of less before taking the samples? | ☐ Yes | ☑ No | |

Turn-Around Time: ◉ 5 Day ○ 3 Day ○ 2 Day ○ 1 Day ○ Same Day / Weekend - Must Call Ahead

SAMPLE TYPE CODES

| AIR/ NON VIABLE | | SPORE TRAP | | SWAB SAMPLE SURFACE | |
|---|---|---|---|---|---|
| Bulk | B | Air-O-Cell | AOC | Non Porous | NP |
| Swab | S | Cyclex D | C | Semi Porous | SP |
| Bio-Tape | T | BioSiS | B | Porous | P |
| Wall Check | W | Micro 5 | M5 | | |

| LAB NUMBER | Client Sample ID | Collection Location | Sample Type | Air Samples: Spore Trap Type | Air Samples: Air Volume (Total Liter) | Swab Samples: Surface Type (NP/SP) | Swab Samples: Area of Mold (Square Feet) | Qualitative Particulate Analysis Additional $10.00 per sample | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1 | A27 | 218 | B | AOC | 150 | | | | 3722 0271 |
| 2 | A28 | 219 | B | AOC | 150 | | | | 3722 0290 |
| 3 | A29 | 2nd Floor Office | B | AOC | 150 | | | | 3722 0283 |
| 4 | A30 | 220 | B | AOC | 150 | | | | 3721 8956 |
| 5 | A31 | 2nd Floor Conference Room | B | AOC | 150 | | | | 3722 0275 |
| 6 | A32 | 221 | B | AOC | 150 | | | | 3722 0282 |
| 7 | A33 | 222 | B | AOC | 150 | | | | 3722 0302 |
| 8 | A34 | 223 | B | AOC | 150 | | | | 3722 0326 |
| 9 | A35 | 224 | B | AOC | 150 | | | | 3722 0293 |
| 10 | A36 | Main Office | B | AOC | 150 | | | | 3722 0323 |
| 11 | A37 | 124 | B | AOC | 150 | | | | 3722 0378 |
| 12 | A38 | 125 | B | AOC | 150 | | | | 3722 0349 |
| 13 | A39 | 126 | B | AOC | 150 | | | | 3722 0341 |

| | | | | | |
|---|---|---|---|---|---|
| Released By: | Robert Curran | Date: | 10/19/23 | Time: | |
| Signature: | Robert Curran | | | | |

LAB USE ONLY – BELOW THIS LINE

Received By: E CHRISTMAS

Signature: E Christmas

Date: 10/19/23 Time: 2:40 ☐ AM ☑ PM

☐ Portal Contact Added

23-10-02953

Due Date:
10/26/2023
(Thursday)
ER

7469 WHITEPINE RD, RICHMOND, VA 23237 (800)-347-4010

RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com

# ENVIRONMENTAL HAZARDS SERVICES, LLC

## Mold Chain of Custody Form



| | | | |
|---|---|---|---|
| Company Name | ECS Mid-Atlantic | Account # | |
| Company Address | 2119 North Hamilton Street | City/State/Zip | Richmond/VA/23230 |
| Phone | 804-353-6333 | Email | rcurran@ecslimited.com |
| Project / Testing Address | Elizabeth Redd Elementary/5601 Jahnke Road, Richmond, Virginia | | |
| PO Number | 47:14153-D | Collected By | Rob Curran |
| Collection Date & Time | 10/18/23 | Outside Air Temp | Indoor Air Temp |
| Was there any precipitation (rain, sleet or snow) 2 hours of less before taking the samples? | ☐ Yes | ☑ No | |

Turn-Around Time: ◉ 5 Day ○ 3 Day ○ 2 Day ○ 1 Day ○ Same Day / Weekend - Must Call Ahead

SAMPLE TYPE CODES

| AIR/ NON VIABLE | | SPORE TRAP | | SWAB SAMPLE SURFACE | |
|---|---|---|---|---|---|
| Bulk | B | Air-O-Cell | ACC | Non Porous | NP |
| Swab | S | Cyclex D | C | Sem Porous | SP |
| Bio-Tape | T | BioSIS | B | Porous | P |
| Wall Check | W | Micro 5 | M5 | | |

| LAB NUMBER | Client Sample ID | Collection Location | Sample Type | Air Samples: Spore Trap Type | Air Samples: Air Volume (Total Liter) | Swab Samples: Surface Type (NP/SP) | Swab Samples: Area of Mold (Square Feet) | Qualitative Particulate Analysis Additional $10.00 per sample | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1 | A40 | Outside | B | AOC | 150 | | | | 3722 0385 |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |

| | | | | | |
|---|---|---|---|---|---|
| Released By: | Robert Curran | Date: | 10/19/23 | Time: | |
| Signature: | Robert Curran | | | | |

LAB USE ONLY – BELOW THIS LINE

Received By: E CHRISTMAS

Signature: E Christmas

Date: 10,19,23 Time: 2:40 ☐ AM ☑ PM

☐ Portal Contact Added

02953

EHS Laboratories

Attach Laboratory Label Here

7469 WHITEPINE RD, RICHMOND, VA 23237 (800)-347-4010

RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com

# Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

**Client:** ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

**Report Number:** 23-10-02952

**Received Date:** 10/19/2023
**Analyzed Date:** 10/26/2023, 10/25/2023
**Reported Date:** 10/26/2023

**Project/Test Address:** Elizabeth Redd Elementary; 5601 Jahnke Road; Richmond, Virginia

**Client Number:**
200625

**Fax Number:**
804-353-9478

## Laboratory Results

| **Lab # :** | 23-10-02952-001 | | 23-10-02952-002 | | 23-10-02952-003 | | 23-10-02952-004 | | 23-10-02952-005 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Client Sample ID :** | A1 | | A2 | | A3 | | A4 | | A5 | |
| **Date Collected :** | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | |
| **Collection Location :** | OUTSIDE | | 101 | | 102 | | 103 | | 104 | |
| **Sampling Media :** | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | |
| **Analytical Sensitivity (spores/m3) :** | 6.7 | | 6.7 | | 6.7 | | 6.7 | | 6.7 | |
| **Volume (L) :** | 150 | | 150 | | 150 | | 150 | | 150 | |
| **Spore ID** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** |
| Cladosporium spores | 255 | 1700 | 54 | 360 | 79 | 530 | 8 | 53 | 19 | 130 |
| Penicillium/Aspergillus group spores | 47 | 310 | 86 | 570 | 29 | 190 | 11 | 73 | 5 | 33 |
| Alternaria spores | 2 | 13 | 1 | 6.7 | | | | | | |
| Aureobasidium spores | | | 1 | 6.7 | | | | | | |
| Drechslera/Bipolaris group spores | 4 | 27 | | | | | | | | |
| Curvularia spores | 1 | 6.7 | | | 1 | 6.7 | | | | |
| Stachybotrys spores | | | | | 1 | 6.7 | | | | |
| Pithomyces spores | 2 | 13 | 1 | 6.7 | 1 | 6.7 | | | | |
| Epicoccum spores | 2 | 13 | | | | | | | | |
| Pestalotia spores | 1 | 6.7 | | | | | | | | |
| Fusarium spores | 6 | 40 | | | | | | | | |
| smuts, Periconia, myxomycetes | 63 | 420 | 16 | 110 | 12 | 80 | | | 1 | 6.7 |
| Bispora spores | | | 3 | 20 | 1 | 6.7 | | | | |
| **TOTAL SPORES(Spores/m3)** | | **2600** | | **1100** | | **830** | | **130** | | **170** |
| **Analyst:** | Kitana Usher | | Kitana Usher | | Kitana Usher | | Kitana Usher | | Kitana Usher | |

# Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

**Client:** ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

**Report Number:** 23-10-02952

**Received Date:** 10/19/2023
**Analyzed Date:** 10/26/2023, 10/25/2023
**Reported Date:** 10/26/2023

**Project/Test Address:** Elizabeth Redd Elementary; 5601 Jahnke Road; Richmond, Virginia

**Client Number:**
200625

**Fax Number:**
804-353-9478

## Laboratory Results

| **Lab # :** | 23-10-02952-006 | | 23-10-02952-007 | | 23-10-02952-008 | | 23-10-02952-009 | | 23-10-02952-010 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Client Sample ID :** | A6 | | A7 | | A8 | | A9 | | A10 | |
| **Date Collected :** | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | |
| **Collection Location :** | 105 | | 106 | | 107 | | 108 | | 109 | |
| **Sampling Media :** | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | |
| **Analytical Sensitivity (spores/m3) :** | 6.7 | | 6.7 | | 6.7 | | 6.7 | | 6.7 | |
| **Volume (L) :** | 150 | | 150 | | 150 | | 150 | | 150 | |
| **Spore ID** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** |
| Cladosporium spores | 25 | 170 | 20 | 130 | 88 | 590 | 63 | 420 | 83 | 550 |
| Penicillium/Aspergillus group spores | 10 | 67 | 6 | 40 | 12 | 80 | 2 | 13 | 24 | 160 |
| Aureobasidium spores | | | | | 2 | 13 | | | | |
| Drechslera/Bipolaris group spores | | | | | 2 | 13 | | | 1 | 6.7 |
| Curvularia spores | | | | | 2 | 13 | 1 | 6.7 | | |
| Pithomyces spores | | | 1 | 6.7 | 2 | 13 | | | | |
| Pestalotia spores | | | | | 1 | 6.7 | | | | |
| Tetraploa spores | | | | | 1 | 6.7 | | | | |
| Fusarium spores | 1 | 6.7 | | | | | 1 | 6.7 | 1 | 6.7 |
| smuts, Periconia, myxomycetes | 8 | 53 | 9 | 60 | 191 | 1300 | 90 | 600 | 6 | 40 |
| **TOTAL SPORES(Spores/m3)** | | **290** | | **240** | | **2000** | | **1000** | | **770** |
| **Analyst:** | Kitana Usher | | Kitana Usher | | Kitana Usher | | Kitana Usher | | Kitana Usher | |

# Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

**Client:** ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

**Report Number:** 23-10-02952

**Received Date:** 10/19/2023
**Analyzed Date:** 10/26/2023, 10/25/2023
**Reported Date:** 10/26/2023

**Project/Test Address:** Elizabeth Redd Elementary; 5601 Jahnke Road; Richmond, Virginia

**Client Number:**
200625

**Fax Number:**
804-353-9478

## Laboratory Results

| **Lab # :** | 23-10-02952-011 | | 23-10-02952-012 | | 23-10-02952-013 | | 23-10-02952-014 | | 23-10-02952-015 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Client Sample ID :** | A11 | | A12 | | A13 | | A14 | | A15 | |
| **Date Collected :** | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | |
| **Collection Location :** | 110 | | 111 | | 111A | | 112 | | 113 | |
| **Sampling Media :** | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | |
| **Analytical Sensitivity (spores/m3) :** | 6.7 | | 6.7 | | 6.7 | | 6.7 | | 6.7 | |
| **Volume (L) :** | 150 | | 150 | | 150 | | 150 | | 150 | |
| **Spore ID** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** |
| Cladosporium spores | 25 | 170 | 8 | 53 | 15 | 100 | 20 | 130 | 3 | 20 |
| Penicillium/Aspergillus group spores | 28 | 190 | 18 | 120 | 34 | 230 | 3 | 20 | 47 | 310 |
| Drechslera/Bipolaris group spores | | | 2 | 13 | | | | | | |
| Curvularia spores | | | | | 3 | 20 | | | | |
| Chaetomium spores | | | 4 | 27 | 1 | 6.7 | | | | |
| Epicoccum spores | | | 1 | 6.7 | 3 | 20 | | | | |
| Pestalotia spores | 1 | 6.7 | | | | | | | | |
| smuts, Periconia, myxomycetes | 5 | 33 | 35 | 230 | 36 | 240 | 9 | 60 | 5 | 33 |
| Bispora spores | | | 1 | 6.7 | | | | | | |
| **TOTAL SPORES(Spores/m3)** | | **390** | | **460** | | **610** | | **210** | | **370** |
| **Analyst:** | Kitana Usher | | Kitana Usher | | Kitana Usher | | Felicia Butler | | Felicia Butler | |

# Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

**Client:** ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

**Report Number:** 23-10-02952

**Received Date:** 10/19/2023
**Analyzed Date:** 10/26/2023, 10/25/2023
**Reported Date:** 10/26/2023

**Project/Test Address:** Elizabeth Redd Elementary; 5601 Jahnke Road; Richmond, Virginia

**Client Number:**
200625

**Fax Number:**
804-353-9478

## Laboratory Results

| **Lab # :** | 23-10-02952-016 | | 23-10-02952-017 | | 23-10-02952-018 | | 23-10-02952-019 | | 23-10-02952-020 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Client Sample ID :** | A16 | | A17 | | A18 | | A19 | | A20 | |
| **Date Collected :** | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | |
| **Collection Location :** | LIBRARY | | TEACHERS LOUNGE | | CAFETERIA | | OUTSIDE | | KITCHEN | |
| **Sampling Media :** | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | |
| **Analytical Sensitivity (spores/m3) :** | 6.7 | | 6.7 | | 6.7 | | 6.7 | | 6.7 | |
| **Volume (L) :** | 150 | | 150 | | 150 | | 150 | | 150 | |
| **Spore ID** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** |
| Cladosporium spores | 109 | 730 | 90 | 600 | 57 | 380 | 245 | 1600 | 75 | 500 |
| Peronospora/Oidium spores | | | | | | | 1 | 6.7 | | |
| Penicillium/Aspergillus group spores | 1 | 6.7 | 52 | 350 | 8 | 53 | 33 | 220 | 39 | 260 |
| Alternaria spores | | | | | | | 1 | 6.7 | 1 | 6.7 |
| Aureobasidium spores | | | | | | | 1 | 6.7 | | |
| Drechslera/Bipolaris group spores | | | | | 1 | 6.7 | 1 | 6.7 | | |
| Pyricularia spores | | | | | | | 2 | 13 | | |
| Curvularia spores | | | | | | | 1 | 6.7 | | |
| Chaetomium spores | | | | | | | 2 | 13 | 1 | 6.7 |
| Epicoccum spores | | | | | | | 1 | 6.7 | | |
| Pestalotia spores | | | | | | | 1 | 6.7 | | |
| Cercospora spores | | | 1 | 6.7 | | | | | | |
| Fusarium spores | | | 1 | 6.7 | | | 2 | 13 | | |
| Trichoderma spores | | | | | | | | | 6 | 40 |
| smuts, Periconia, myxomycetes | 99 | 660 | 18 | 120 | 7 | 47 | 51 | 340 | 5 | 33 |

# Environmental Hazards Services, L.L.C

**Client Number:** 200625 **Report Number:** 23-10-02952

**Project/Test Address:** Elizabeth Redd Elementary; 5601 Jahnke Road; Richmond, Virginia

| Lab # : | 23-10-02952-016 | | 23-10-02952-017 | | 23-10-02952-018 | | 23-10-02952-019 | | 23-10-02952-020 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Spore ID** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** |
| **TOTAL SPORES(Spores/m3)** | | **1400** | | **1100** | | **490** | | **2300** | | **850** |
| **Analyst:** | Felicia Butler | | Felicia Butler | | Felicia Butler | | Felicia Butler | | Felicia Butler | |

# Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

**Client:** ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

**Report Number:** 23-10-02952

**Received Date:** 10/19/2023
**Analyzed Date:** 10/26/2023, 10/25/2023
**Reported Date:** 10/26/2023

**Project/Test Address:** Elizabeth Redd Elementary; 5601 Jahnke Road; Richmond, Virginia

**Client Number:**
200625

## Laboratory Results

**Fax Number:**
804-353-9478

| **Lab # :** | 23-10-02952-021 | | 23-10-02952-022 | | 23-10-02952-023 | | 23-10-02952-024 | | 23-10-02952-025 | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Client Sample ID :** | A21 | | A22 | | A23 | | A24 | | A25 | |
| **Date Collected :** | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | | 10/18/2023 | |
| **Collection Location :** | NURSES OFFICE | | AUDITORIUM | | 214 | | 215 | | 216 | |
| **Sampling Media :** | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | | Air-O-Cell | |
| **Analytical Sensitivity (spores/m3) :** | 6.7 | | 6.7 | | 6.7 | | 6.7 | | 6.7 | |
| **Volume (L) :** | 150 | | 150 | | 150 | | 150 | | 150 | |
| **Spore ID** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** |
| Cladosporium spores | 59 | 390 | 44 | 290 | 14 | 93 | 22 | 150 | 9 | 60 |
| Penicillium/Aspergillus group spores | 51 | 340 | 38 | 250 | 2 | 13 | 6 | 40 | 5 | 33 |
| Aureobasidium spores | | | | | | | | | 2 | 13 |
| Curvularia spores | 3 | 20 | | | | | 2 | 13 | 1 | 6.7 |
| Stachybotrys spores | | | | | | | 2 | 13 | | |
| Ulocladium spores | 1 | 6.7 | | | | | | | | |
| Pithomyces spores | 1 | 6.7 | | | | | | | | |
| Epicoccum spores | | | | | | | | | 1 | 6.7 |
| Pestalotia spores | | | | | 1 | 6.7 | | | | |
| smuts, Periconia, myxomycetes | 28 | 190 | 5 | 33 | 15 | 100 | 85 | 570 | 65 | 430 |
| Bispora spores | | | | | | | | | 3 | 20 |
| **TOTAL SPORES(Spores/m3)** | | **950** | | **580** | | **210** | | **780** | | **570** |
| **Analyst:** | Felicia Butler | | Felicia Butler | | Felicia Butler | | Felicia Butler | | Felicia Butler | |

# Non-Viable Spore Trap Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

**Client:** ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

**Report Number:** 23-10-02952

**Received Date:** 10/19/2023
**Analyzed Date:** 10/26/2023, 10/25/2023
**Reported Date:** 10/26/2023

**Project/Test Address:** Elizabeth Redd Elementary; 5601 Jahnke Road; Richmond, Virginia

**Client Number:**
200625

## Laboratory Results

**Fax Number:**
804-353-9478

| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **Lab # :** | 23-10-02952-026 | | | | | | | | | |
| **Client Sample ID :** | A26 | | | | | | | | | |
| **Date Collected :** | 10/18/2023 | | | | | | | | | |
| **Collection Location :** | 217 | | | | | | | | | |
| **Sampling Media :** | Air-O-Cell | | | | | | | | | |
| **Analytical Sensitivity (spores/m3) :** | 6.7 | | | | | | | | | |
| **Volume (L) :** | 150 | | | | | | | | | |
| **Spore ID** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** | **Raw Count** | **Results (Spores/m3)** |
| Cladosporium spores | 28 | 190 | | | | | | | | |
| Penicillium/Aspergillus group spores | 5 | 33 | | | | | | | | |
| Curvularia spores | 2 | 13 | | | | | | | | |
| Stachybotrys spores | 1 | 6.7 | | | | | | | | |
| Epicoccum spores | 1 | 6.7 | | | | | | | | |
| smuts, Periconia, myxomycetes | 35 | 230 | | | | | | | | |
| **TOTAL SPORES(Spores/m3)** | | **480** | | | | | | | | |
| **Analyst:** | Felicia Butler | | | | | | | | | |

***Sample Narratives:***

(Sample 019) M02: Large amounts of particulate observed.

# Environmental Hazards Services, L.L.C

**Client Number:** 200625 **Report Number:** 23-10-02952

**Project/Test Address:** Elizabeth Redd Elementary; 5601 Jahnke Road; Richmond, Virginia

**Method:** Non-Culturable Spore Trap Examination

Reviewed By Authorized Signatory: Tasha Eaddy

*Tasha Eaddy*
QA/QC Clerk

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the client. Sample location, description, volume, etc., was provided by the client. The Client is hereby notified that due to the subjective nature of fungal analysis and the growth process of fungal infestation, laboratory samples can and do change over time relative to the originally sampled material. This report shall not be reproduced except in full, without the written consent of Environmental Hazards Services, L.L.C.

# ENVIRONMENTAL HAZARDS SERVICES, LLC

## Mold Chain of Custody Form



| | | | |
|---|---|---|---|
| Company Name | ECS Mid-Atlantic | Account # | |
| Company Address | 2119 North Hamilton Street | City/State/Zip | Richmond/VA/23230 |
| Phone | 804-353-6333 | Email | rcurran@ecslimited.com |
| Project / Testing Address | Elizabeth Redd Elementary/5601 Jahnke Road, Richmond, Virginia | | |
| PO Number | 47:14153-D | Collected By | Rob Curran |
| Collection Date & Time | 10/18/23 | Outside Air Temp | Indoor Air Temp |

Was there any precipitation (rain, sleet or snow) 2 hours of less before taking the samples? ☐ Yes ☑ No

Turn-Around Time: ◉ 5 Day ○ 3 Day ○ 2 Day ○ 1 Day ○ Same Day / Weekend - Must Call Ahead

SAMPLE TYPE CODES

| AIR/ NON VIABLE | | SPORE TRAP | | SWAB SAMPLE SURFACE | |
|---|---|---|---|---|---|
| Bulk | B | Air-O-Cell | AOC | Non Porous | NP |
| Swab | S | Cyclex C | C | Semi Porous | SP |
| Bio-Tape | T | BioSiS | B | Porous | P |
| Wall Check | W | Micro 5 | M5 | | |

| LAB NUMBER | Client Sample ID | Collection Location | Sample Type | Air Samples: Spore Trap Type | Air Samples: Air Volume (Total Liter) | Swab Samples: Surface Type (NP/SP) | Swab Samples: Area of Mold (Square Feet) | Qualitative Particulate Analysis Additional $10.00 per sample | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1 | A1 | Outside | B | AOC | 150 | | | | 3721 8932 |
| 2 | A2 | 101 | B | AOC | 150 | | | | 3721 8962 |
| 3 | A3 | 102 | B | AOC | 150 | | | | 3721 8999 |
| 4 | A4 | 103 | B | AOC | 150 | | | | 3722 0308 |
| 5 | A5 | 104 | B | AOC | 150 | | | | 3722 0311 |
| 6 | A6 | 105 | B | AOC | 150 | | | | 3722 0307 |
| 7 | A7 | 106 | B | AOC | 150 | | | | 3722 0322 |
| 8 | A8 | 107 | B | AOC | 150 | | | | 3721 8939 |
| 9 | A9 | 108 | B | AOC | 150 | | | | 3721 8987 |
| 10 | A10 | 109 | B | AOC | 150 | | | | 3721 8969 |
| 11 | A11 | 110 | B | AOC | 150 | | | | 3721 9006 |
| 12 | A12 | 111 | B | AOC | 150 | | | | 3722 0419 |
| 13 | A13 | 111A | B | AOC | 150 | | | | 3722 0294 |

Released By: Robert Curran Date: 10/19/23 Time: 2:33 pm

Signature: Robert Curran

LAB USE ONLY – BELOW THIS LINE

Received By: ECHRISTMAS

Signature:

Date: 10.19.23 Time: 2:40 ☐ AM ☒ PM

☐ Portal Contact Added

23-10-02952

Due Date: 10/26/2023 (Thursday) ER

7469 WHITEPINE RD, RICHMOND, VA 23237 (800)-347-4010

RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com

# ENVIRONMENTAL HAZARDS SERVICES, LLC

## Mold Chain of Custody Form



| | | | |
|---|---|---|---|
| Company Name | ECS Mid-Atlantic | Account # | |
| Company Address | 2119 North Hamilton Street | City/State/Zip | Richmond/VA/23230 |
| Phone | 804-353-6333 | Email | rcurran@ecslimited.com |
| Project / Testing Address | Elizabeth Redd Elementary/5601 Jahnke Road, Richmond, Virginia | | |
| PO Number | 47:14153-D | Collected By | Rob Curran |
| Collection Date & Time | 10/18/23 | Outside Air Temp | Indoor Air Temp |
| Was there any precipitation (rain, sleet or snow) 2 hours of less before taking the samples? | ☐ Yes | ☑ No | |

Turn-Around Time: ◉ 5 Day ○ 3 Day ○ 2 Day ○ 1 Day ○ Same Day / Weekend - Must Call Ahead

SAMPLE TYPE CODES

| AIR/ NON VIABLE | | SPORE TRAP | | SWAB SAMPLE SURFACE | |
|---|---|---|---|---|---|
| Bulk | B | Air-O-Cell | AOC | Non Porous | NP |
| Swab | S | Cyclex D | C | Semi Porous | SP |
| Bio-Tape | T | BioSiS | B | Porous | P |
| Wal Check | W | Micro 5 | M5 | | |

| LAB NUMBER | Client Sample ID | Collection Location | Sample Type | Air Samples: Spore Trap Type | Air Samples: Air Volume (Total Liter) | Swab Samples: Surface Type (NP/SP) | Swab Samples: Area of Mold (Square Feet) | Qualitative Particulate Analysis Additional $10.00 per sample | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1 | A14 | 112 | B | AOC | 150 | | | | 3722 0286 |
| 2 | A15 | 113 | B | AOC | 150 | | | | 3722 0379 |
| 3 | A16 | Library | B | AOC | 150 | | | | 3722 0298 |
| 4 | A17 | Teacher's Lounge | B | AOC | 150 | | | | 3722 0334 |
| 5 | A18 | Cafeteria | B | AOC | 150 | | | | 3722 0316 |
| 6 | A19 | Outside | B | AOC | 150 | | | | 3722 0303 |
| 7 | A20 | Kitchen | B | AOC | 150 | | | | 3722 0328 |
| 8 | A21 | Nurse's Office | B | AOC | 150 | | | | 3722 0382 |
| 9 | A22 | Auditorium | B | AOC | 150 | | | | 3722 0359 |
| 10 | A23 | 214 | B | AOC | 150 | | | | 3721-8917 |
| 11 | A24 | 215 | B | AOC | 150 | | | | 3722 0301 |
| 12 | A25 | 216 | B | AOC | 150 | | | | 3721 8942 |
| 13 | A26 | 217 | B | AOC | 150 | | | | 3721 8961 |

| | | | | | |
|---|---|---|---|---|---|
| Released By: | Robert Curran | Date: | 10/19/23 | Time: | |
| Signature: | Robert Curran | | | | |

LAB USE ONLY – BELOW THIS LINE

Received By: EL HRISTMAS

Signature: El

Date: 10/19/23 Time: 2:40 ☐ AM ☑ PM

☐ Portal Contact Added

02952

EHS Laboratories

Attach Laboratory Label Here

7469 WHITEPINE RD, RICHMOND, VA 23237 (800)-347-4010

RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com

# Non-Viable Surface/Bulk Analysis Report

Environmental Hazards Services, L.L.C.
7469 Whitepine Rd
Richmond, VA 23237

Telephone: 800.347.4010

**Client:** ECS Mid-Atlantic - Richmond
2119 D North Hamilton St
Richmond, VA 23230

**Report Number:** 23-11-00159

**Received Date:** 11/01/2023
**Analyzed Date:** 11/07/2023, 11/08/2023
**Reported Date:** 11/08/2023

**Project/Test Address:** Redd Elementary; 5601 Jahnke Road; Richmond, Virginia

**Client Number:**
200625

## Laboratory Results

**Fax Number:**
804-353-9478

| | | | |
|---|---|---|---|
| **Lab # :** | 23-11-00159-001 | **Collection Location:** | 224 BEHIND BASEBOARD |
| **Client Sample ID :** | Tape T-1 | **Date Analyzed:** | 11/7/2023 |
| **Date Collected :** | 10/31/2023 | **Analyst:** | Felicia Butler |

| | |
|---|---|
| Occasional | smuts, Periconia, myxomycetes |
| Occasional | rusts* |
| Occasional | Stachybotrys spores and hyphal elements |
| Occasional | Curvularia spores |
| Occasional | Drechslera/Bipolaris group spores |
| Occasional | pollen grains* |

**Note:**

| | | | |
|---|---|---|---|
| **Lab # :** | 23-11-00159-002 | **Collection Location:** | DRYWALL CEILING LIBRARY HALLWAY |
| **Client Sample ID :** | Tape T-2 | **Date Analyzed:** | 11/8/2023 |
| **Date Collected :** | 10/31/2023 | **Analyst:** | Felicia Butler |

| | |
|---|---|
| Few | smuts, Periconia, myxomycetes |
| Few | basidiospores |
| Occasional | pollen grains* |
| Occasional | Ulocladium spores |
| Occasional | Cladosporium spores |
| Occasional | Nigrospora spores |
| Few | Penicillium/Aspergillus group spores |
| Few | hyphal elements* |
| Occasional | Stachybotrys spores and hyphal elements |
| Occasional | Curvularia spores |
| Occasional | Epicoccum spores |
| Occasional | Drechslera/Bipolaris group spores |
| Occasional | Pithomyces spores |
| Occasional | Pestalotia spores |

**Note:**

# Environmental Hazards Services, L.L.C

**Client Number:** 200625 **Report Number:** 23-11-00159

**Project/Test Address:** Redd Elementary; 5601 Jahnke Road; Richmond, Virginia

Quantification Key:

| | |
|---|---|
| Numerous: | Several spores seen in every field |
| Moderate: | At least 1 spore seen in 5 fields |
| Few: | Over 5 spores seen per cover slip, but less than 1 spore seen in 5 fields |
| Occasional: | 1-5 spores seen per a cover slip |

**Method:** Direct Microscopic Exam

Reviewed By Authorized Signatory: Tasha Eaddy

*Tasha Eaddy*
QA/QC Clerk

The condition of the samples analyzed was acceptable upon receipt per laboratory protocol unless otherwise noted on this report. Results represent the analysis of samples submitted by the client. Sample location, description, volume, etc., was provided by the client. The Client is hereby notified that due to the subjective nature of fungal analysis and the growth process of fungal infestation, laboratory samples can and do change over time relative to the originally sampled material. This report shall not be reproduced except in full, without the written consent of Environmental Hazards Services, L.L.C.

# ENVIRONMENTAL HAZARDS SERVICES, LLC

## Mold Chain of Custody Form



| | | | |
|---|---|---|---|
| Company Name | ECS Mid-Atlantic | Account # | |
| Company Address | 2119 North Hamilton Street | City/State/Zip | Richmond/VA/23230 |
| Phone | 804-353-6333 | Email | rcurran@ecslimited.com |
| Project / Testing Address | Redd elementary, 5601 Jahnke Road, Richmond, Virginia | | |
| PO Number | 47:14153 - D | Collected By | Rob Curran |
| Collection Date & Time | 10/31/2023 | Outside Air Temp | Indoor Air Temp |
| Was there any precipitation (rain, sleet or snow) 2 hours of less before taking the samples? | ☐ Yes | ☑ No | |

Turn-Around Time: ◉ 5 Day ○ 3 Day ○ 2 Day ○ 1 Day ○ Same Day / Weekend - Must Call Ahead

SAMPLE TYPE CODES

| AIR/ NON VIABLE | | SPORE TRAP | | SWAB SAMPLE SURFACE | |
|---|---|---|---|---|---|
| Bulk | B | Air-O-Cell | AOC | Non Porous | NP |
| Swab | S | Cyclex C | C | Semi Porous | SP |
| Bio-Tape | T | BioSiS | B | Porous | P |
| Wall Check | W | Micro 5 | M5 | | |

| LAB NUMBER | Client Sample ID | Collection Location | Sample Type | Air Samples: Spore Trap Type | Air Samples: Air Volume (Total Liter) | Swab Samples: Surface Type (NP/SP) | Swab Samples: Area of Mold (Square Feet) | Qualitative Particulate Analysis Additional $10.00 per sample | Comments |
|---|---|---|---|---|---|---|---|---|---|
| 1 | T-1 | 224, behind baseboard | T | | | | | | |
| 2 | T-2 | Drywall ceiling, library hallway | T | | | | | | |
| 3 | | | T | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |

Released By: Robert Curran Date: 11/01/2023 Time: 3:40 pm

Signature:

LAB USE ONLY – BELOW THIS LINE

Received By: ECHRISTIANS

Signature:

Date: 11/1/23 Time: 3:46 ☐ AM ☒ PM

☐ Portal Contact Added

23-11-00159

Due Date: 11/08/2023 (Wednesday) ER

7469 WHITEPINE RD, RICHMOND, VA 23237 (800)-347-4010

RESULTS VIA CLIENT PORTAL AVAILABLE @ www.leadlab.com

# Appendix III: Mold and Moisture Photos Main Building


1 - Moisture meter reading collected in the Room 101 bathroom indicating elevated moisture beneath the flooring

2 - Mold on pipe insulation in Room 101

3 - Mold and moisture impacted plaster wall behind piping in Room 101


4 - Elevated moisture meter reading collected from impacted pipe insulation in Room 101

5 - Suspect mold on the plaster wall beneath the fan coil

6 - Moisture stained pipe insulation in Room 107


7 - Elevated moisture meter reading collected from pipe insulation in Room 102


8 - Elevated moisture meter reading collected from pipe insulation in Room 102

9 - Mold on pipe insulation in Room 102

10 - Mold on pipe insulation in Room 102


11 - Moisture damaged plaster wall in Room 108

12 - Moisture damaged drywall observed in library hallway on 10-18-23

13 - Moisture damaged plaster ceiling observed in Room 111 observed on 10-18-23

14 - Moisture damaged plaster wall observed in Room 111 on 10-18-23

15 - Repaired plaster wall in room 111 observed on 10-30-23

16 - Moisture damaged plaster wall observed in room beside Room 111 on 10-18-23


17 - Mold and moisture impacted pipe insulation in the room beside Room 111


18 - Elevated moisture meter reading collected from the plaster wall around piping in the room beside Room 111

19 - Mold and moisture impacted drywall and framing above the Library hallway

20 - Mold and moisture impacted drywall and framing above the Library hallway

21 - Moisture impacted ceiling tiles in Room 112

22 - Significant rusting on HVAC diffusers in Room 112

23 - Mold observed on roof drain pipe insulation in the library

24 - Mold observed on the HVAC supply vents on the main trunk in the library


25 - Mold on HVAC duct board in the cafeteria

26 - Moisture and mold impacted pipe insulation in the cafeteria

27 - Elevated moisture meter reading collected from a plaster wall in the cafeteria

28 - Elevated moisture meter reading collected from the plaster wall in the kitchen by the container storage indicating that the wall is saturated

29 - Elevated moisture reading indicating elevated moisture beneath the flooring in the Nurse's bathroom

30 - Mold and moisture impacted pipe insulation above the ceiling in the Teacher's Lounge indicating elevated moisture. Elevated moisture readings detected.

31 - Rusting on HVAC supply diffuser in the Nurse's office

32 - Mold on the floor and rust at the base of a file cabinet in the Nurse's office


33 - Elevated moisture meter reading in the 2nd floor office between 219 and 220 indicating moisture is trapped beneath the floor tile

34 - Moisture impacted plaster ceiling in Room 218

35 - Elevated moisture meter reading indicating that the plaster ceiling is saturated and an active moisture source may be present above the ceiling in Room 218

36 - Elevated moisture meter reading collected from the wall in Room 217

37 - Elevated moisture meter reading collected from the plaster wall in the stairwell by Room 110

38 - Elevated moisture meter reading collected from a plaster wall in the hallway across from Room 110

39 - Mold on pipe insulation  by the  stage (right)

40 - Moisture stained HVAC duct insulation by the  stage (right)

41 - Mold on HVAC duct insulation adhesive by the stage (left)

42 - Mold on pipe insulation by stage (right)


43 - Elevated moisture meter reading collected from pipe  insulation - by stage (right)

44 - Leaking pipe causing standing water on the floor of the boiler room

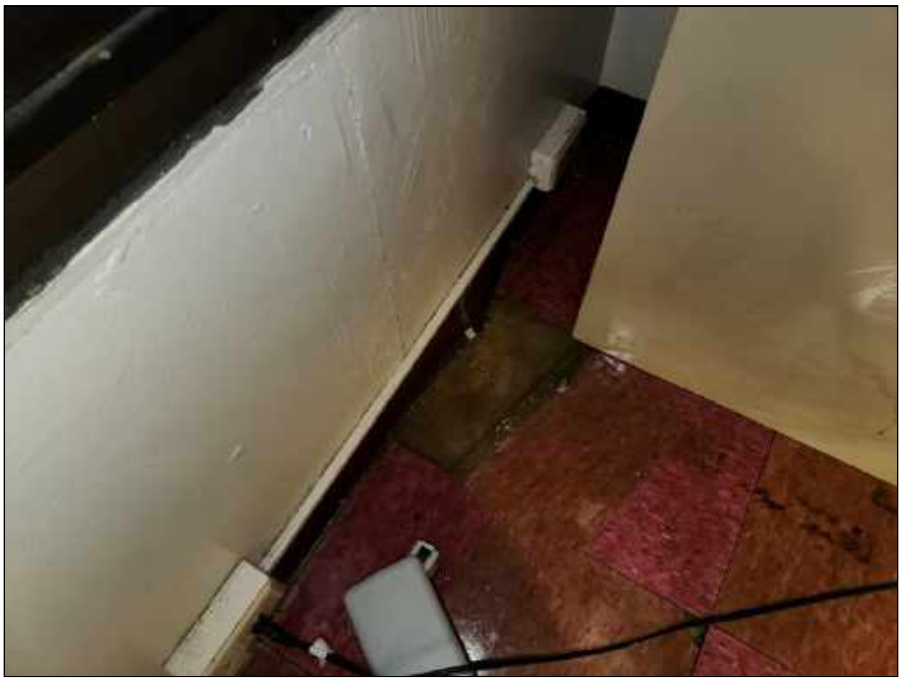
45 - Water leaking from holes in the back wall of the boiler room

46 - Standing water on the floor of the boiler room caused by  water leaking from the wall (exterior)

47 - Mold on pipe insulation in the boiler room

48 - Moisture damaged plaster wall in Room 124  - Activities Room

49 - Mold and moisture impacted drywall in Room 126 - the Music Room



50 - Moisture damaged drywall and water on the floor in Room 126

# Appendix IV: Mold and Moisture Photos Pod Classrooms

1 - Mold impacted drywall at the entrance to the pod classrooms

2 - Elevated moisture meter reading collected from the tectum ceiling in the pod connector hall

3 - Mold impacted ceiling tiles above the large HVAC supply vent in classroom 103 and evidence of moisture accumulation within the vent

4 - Mold on floor tiles and the base of the plaster wall in the janitor's closet

# Appendix V: Mold and Moisture Photos Main Building Exterior Envelope

1 - Rusted window frame and damaged window ledge at an Audtorium window

2 - Damaged window glazing at an Auditorium window

3 - Damaged window ledge at an Auditorium window

4 - Damaged sealants associated with the exterior metal wall panels outside Room 126

5 - Damaged window ledge at a Cafeteria window

6 - Apparent bullet holes in the exterior metal panels on the Activities portion of the building

7 - Courtyard between the Activities portion of the building and the Cafeteria

8 - Clogged storm water drain in the courtyard

9 - Damaged window ledge on the East side of the building

10 - Damaged window ledge on the East side of the building

11 - Damaged window ledges on the North side of the building

12 - Drain on the East side of the building draining against the foundation

13 - Downspout draining against the foundation outside the main office

# Appendix VI: Mold and Moisture Photos Pod Classrooms

1 - A downspout draining against the foundation

2 - A downspout draining against the foundation

3 - A downspout draining against the foundation

4 - A downspout draining against the foundation

5 - Damaged gutter causing moisture intrusion on the tectum ceiling in the connector hallway

6 - Damaged exterior wood wall panels

7 - Damaged soffit and elevated moisture meter reading

# Appendix VII: Mold Reference and Guidance Documents

# MOLD REFERENCE DOCUMENTS AND GUIDANCE

## Standards and Publications

Mold Remediation in Schools and Commercial Buildings, EPA, EPA 402-K-01-001, September 2008

A Brief Guide to Mold in the Workplace, Occupational Safety Health Administration (OSHA), SHIB 03-10-10, updated 11-08-13

ANSI/IICRC S520-2015 Standard and Reference Guide for Professional Mold Remediation, Institute of Inspection, Cleaning, and Restoration Certification, Third Edition

ANSI/IICRC S500-2021 Standard and Reference Guide for Professional Water Damage Restoration, Institute of Inspection, Cleaning, and Restoration Certification, Fifth Edition

Bioaerosols: Assessment and Control, American Conference of Governmental Industrial Hygienists, 1999.

Building Air Quality: A Guide for Building Owners and Facility Managers, National Institute for Occupational Safety and Health (NIOSH) and Environmental Protection Agency (EPA) EPA 402F-91-102, December 1991

Mold Moisture and Your Home, EPA, EPA-402-K-02-003, September 2012

WHO Guidelines for Indoor Air Quality: Dampness and Mould, World Health Organization (WHO), 2009

Guidelines on Assessment and Remediation of Fungi in Indoor Environments, New York City Department of Health and Mental Hygiene, November 2008.

Damp Buildings, Human Health, and HVAC Design, Report of the ASHRAE Multidisciplinary Task Group: Damp Buildings, American Society of Heating, Refrigerating, and Air Conditioning Engineers, 2020

## Websites

EPA – Mold Resources, https://www.epa.gov/mold

Centers for Disease Control and Prevention (CDC), https://www.cdc.gov/mold/faqs.htm

Department of Energy and the Environment (DOEE), Mold Assessment and Remediation Licensure Regulations https://doee.dc.gov/service/mold-professional-licensing

Virginia Department of Health, Environmental Health, Public Health Toxicology, Mold https://www.vdh.virginia.gov/environmental-health/public-health-toxicology/mold/