MAC Services, LLC

Environmental Specialist

October 29, 2024

Barnstable Public Schools
230 South Street
Hyannis, MA 02601
Attention: Tammy Cunningham

Re: Microbial Determination survey at the Barnstable Unity Elementary School Building located at 730 Barnstable West Barnstable Street in Marstons Mills, MA.

Scope of Work

As you requested, on October 17, 2024, MAC Services, LLC (MAC) conducted a mold determination survey for the purpose of identifying the visible presence of mold as well as air sampling for potentially elevated levels of mold spore activity within the specific areas sampled at the above referenced location. Joseph Cooney, an experienced environmental technician in the Indoor Air Quality (IAQ) Industry, conducted the survey. The areas to be inspected were specified.

The results of fungal air samples are determined by utilizing a comparative analysis with current conditions outdoors at the time of indoor sampling using Industry standard guidelines for acceptable levels of mold spore activity. In addition to the outdoor sample, samples were collected in the following locations:

- Room 125
- Room 243
- Room 241
- Room 239
- Room in office area (Vice-Principal)

Tape lift samples are obtained by applying directly to a suspect area of discoloration then analyzed under a microscope to determine microbiological contamination estimations by mold type.

In addition to the air samples obtained, there was a total of One (1) tape lift sample obtained from the following location:

- Room 241 from window screen
- Room 125 from side of wood cabinet
- Room 239 from bottom of separation wall
- Room 239 from Whale decoration
- Room 243 from sink cabinet door

Discussion

Fungal bio-aerosol monitoring is the sampling of spores from the air onto a media slide. Utilizing a microscope, the spores are then identified at least to genus and counted. Comparisons with outside levels and types indicate whether pathogenic species have been or have become predominate and at what concentration in a particular area.

All mold samples were analyzed by H2O EnviroComp, an EMPAT (Environmental Microbiology Proficiency Analytical Testing) proficient Laboratory located in West Dennis, MA. This evaluation is limited in scope and reflects the levels of fungal contaminants on the day of sampling. Airborne levels of fungal spores will vary naturally and conditions may change in the future which could promote the growth of mold or create other air quality concerns in the interior environment. The industry standard acceptable level of spore counts for most species of mold is generally 1,000 s/cu m. Again, based on Industry Standard averages, the acceptable level is generally lower for some more harmful species such as Chaetomium, (600 s/ cu m) and Stachybotrys (400 s/cu m).

In addition to the threat mold poses against the structural integrity and value of a property, bacterial / fungal magnification or enhancement within a building can lead to a number of health issues. Associated health risks can include respiratory as well as pulmonary symptoms. Some molds produce mycotoxins which can lead to effects on the neurological system. All types of mold are harmful to health to some degree so deciding on action to be taken should not depend on the type of mold rather the overall concentration level of specific mold spores.

The absence of spores and visible colonies does not always ensure that no microbiological colonies exist. Colonies may be hidden, and spores released sporadically based on environmental conditions, in particular, humidity levels.

The effects of mold spores depend on a number of variables including the pre-existing health of the occupants, the sensitivity level and age of the inhabitants of the space, as well as the type of mold contaminants and concentration levels of mold spore counts. MAC services utilize several sources of Industry guidelines when interpreting air sample analytical data, including the EPA (Environmental Protection Agency) and IICRC (Institute of Inspections Cleaning and Restoration Certification) organizations.

Observations

The areas subject to sampling are within the first and second levels of the School building. The building construction materials consist of steel decking, CMU block walls, fiberglass pipe insulated pipes above the ceiling tiles, ceiling tile grid system and vinyl floor tiles. The classrooms are approximately 900 square feet in area space. There were dehumidifier and air purifier units running in the classrooms and two of the rooms did have windows partially opened. The uni-vent HVAC units were running upon arrival but were turned off to allow for undisturbed air flow during the air sampling as were the dehumidifiers and air purifiers.

The indoor temperature was measured to be between 66 and 69 degrees and the Relative Humidity (RH) was measured to be between 40% and 43%. The outdoor temperature was 54.0 degrees with a RH of 50%. There were no areas that appeared to be wet to the touch. While there were no obvious odors detected within the classrooms there was an obvious odor detected upon entered the Vice Principal office. Visual observations were as follows:

- Room 125 – Isolated areas of dust build up on teacher's desk.
- Room 125 – Suspect discoloration on side of wood cabinet (Tape Lift (TL) sampled).
- Room 243 – Some stained ceiling tile in area bordering the stairwell.
- Room 243 – Visible mold contamination on the inside of the sink cabinet door (TL sampled).
- Room 241 – Visible suspect dust buildup on window screens (TL sampled).
- Room 241 – Back of desk against wall bordering room 239 had suspect visible growth.
- Room 239 – Suspect discoloration at bottom of divider wall (TL sampled).
- Room 239 – Mold observed of whale decoration (TL sampled).

Note: Pipe insulation above ceiling tile did not have any mold growth observed. There was generally minor dust build up on many of the storage shelves and inside closed cabinets.

Conclusion

Based on the analytical results, MAC Services has concluded that the mold spore activity at the time of sampling was as follows:

- *Elevated for Cladosporium in room 243.*
- *Slightly elevated for Cladosporium in room 241.*
- *Very elevated for Aspergillus/Penicillium-like spores in the unoccupied Vice-Principal's office.*

It was at acceptable levels in rooms 125 and 239.

The air sample results in rooms 243 and 241 are not at the desired levels, however, they are not at what would be considered dangerous levels for the general population. It is noteworthy that while the levels outdoors for Cladosporium where not elevated at the time of sampling, they were active. In other words, there were some levels of Cladosporium at the time of sampling. This is significant because when entering rooms 241 and 239 it was observed that there were some windows partially opened allowing the outdoor air into the rooms which could have impacted the air samples to some extent.

The tape lift results were as follows:

- *High for Cladosporium on the room 241 window screens.*
- *Medium concentration for Aspergillus/Penicillium-like spores on the side of the wood cabinet in room 125*
- *High for Cladosporium on the whale decoration in room 239.*
- *High concentration for Aspergillus/Penicillium-like spores on the sink cabinet door in room 243.*

There was visible evidence detailed in the observations that corroborate some of the Tape Lift analytical results.

Note: Please see the attached Analytical Report

Recommendation

To avoid interior mold growth in the future, any water intrusion must be remedied by repairing immediately and drying out any resulting affected areas within 48 hours.

Maintaining humidity levels below 60%, good housekeeping including regular changing of the HVAC filters, good building maintenance practices, as well as the elimination of moisture and / or the quick response to flood events / moisture intrusions are key to minimizing the potential for mold growth indoors.

Specific recommendations for the areas surveyed are as follows:

1) Clean the window screens with an EPA registered fungicide solution using sprayers, stiff nylon brushes and clean rags. They can be removed and cleaned or cleaned in place. If cleaned in place, the room should be air scrubbed with a large (2,000 CFM) HEPA filtered negative air machine before post cleaning air samples are run.

2) Remediate the sink cabinet interior in room 243 by wiping down with an EPA registered fungicide.

3) The wood cabinet in room 125 can be cleaned with an EPA registered fungicide but may need additional treatment with a wire brush and or sanding. This would need to be either completed outdoors or within a contained work area indoors with HEPA negative air controlled contained work area.

4) Clean dusty shelves and inside cabinets in all rooms with industrial strength detergent.

5) Remove the whale decoration from room 239.

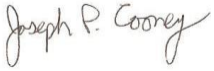
6) The room in the office area will need to be remediated under a full containment, HEPA filtered negative air pressured work area. This should be completed by an experienced, insured and certified Mold Remediation company. All walls (and windows) as well as any furniture to remain should be thoroughly wiped down with EPA registered fungicide-soaked clean cloth rags. The floor tiles need to be removed (check if they are asbestos containing before removing), and the concrete slab treated with an EPA registered fungicide, scrubbed and treated a second time. As a precaution, the ceiling tile should be replaced as well. Follow up testing after the remediation is completed is recommended. This should be done with the contained area still in place but with the negative air system shut down at least 12 hours prior to air sampling.

7) Follow up air / tape lift sampling is recommended for the other rooms cleaned as well to ensure the remediation activity worked.

Note: If work is to be completed in the areas other than the office area by internal maintenance personnel, proper Personal Protective Equipment (PPE) should be worn including a respirator and work gloves.

Please call me at (508)789-0983 with any questions or further clarifications of this report you may need.

Regards,



Joseph Cooney
MAC Services, LLC