



December 22, 2024

Dare County Schools
Ian Adams
3020 S. Wrightsville Avenue
Nags Head, NC

**Re: Limited Environmental Post Remediation Verification Investigation with Airborne Sampling at Kitty Hawk Elementary School and follow up air testing at Nags Head Elementary and Manteo High School.
LRC Project – 24-3478**

At your request, on December 18, 2024, LRC Indoor Testing & Research, Inc. (LRC) performed a limited environmental fungal post remediation verification inspection that included airborne sampling at the properties listed above. This project was requested to characterize the types and levels of airborne fungi in the structure. This fungal inspection was requested at the completion of remediation at Kitty Hawk Elementary and as a follow up to previous sampling at Nags Head Elementary and Manteo High School.

LRC performs all water-damage and fungal investigations with sampling and recommendations in accordance with guidelines published in *Bioaerosols: Assessment and Control*, by the American Conference of Governmental Industrial Hygienists (ACGIH), in *Mold Remediation in Schools and Commercial Buildings* by the United States Environmental Protection Agency (USEPA), and in the currently recognized and accepted industry standards including the ANSI/IICRC S500 *Standard and Reference Guide for Professional Water Damage Restoration*, Fourth Edition (S500) and the ANSI/IICRC S520 *Standard and Reference Guide for Professional Mold Remediation*, Third Edition (S520).

Our inspection included the following:

1. Visual inspection of the remediated areas.
2. Measure temperature and relative humidity indoors and outdoors.
3. Collect representative non-viable spore trap air samples indoors and one outdoors for comparison.
4. Provide a written report describing the survey results and comparing those results to accepted guidelines and directives. This report includes a summary of data, Certificates of Laboratory Analysis and a remediation protocol, if needed, based on the ANSI/IICRC S520 *Standard and Reference Guide for Professional Mold Remediation*, Third Edition (S520).

VISUAL INSPECTIONS, MOISTURE MEASUREMENTS, AND RELATIVE HUMIDITY

A calibrated moisture meter was used to measure moisture levels on representative hard surfaces. Typically, moisture contents approaching 17% and greater represent excessive moisture on hard surfaces (wood) in conditioned spaces; however, in non-conditioned spaces wood and semi-porous materials may approach these threshold levels naturally due to seasonal changes in temperature and humidity.

Kitty Hawk Elementary

The temperature and relative humidity are summarized in Table A below. The relative humidity met the current ASHRAE Standard to maintain indoor relative humidity below 60%.

Table A – Temperature and Relative Humidity by Location

Location	Temperature	Relative Humidity
Kitty Hawk Elementary	71 to 72°F	56 to 58%
Outdoors	64°F	74%

General Observations:

The subject property is a one to two story building used as an elementary school. Previous testing had indicated that there was an issue in the area of room G101 and the adjoining hallways. This investigation was requested at the completion of remediation activity in the area to assess the current environmental conditions.

In Room G101, it was reported that repairs had been made to the roof above the rear wall of the room. The sheetrock had been removed in a four-foot by eight-foot area above the drop ceiling. The remaining sheetrock in that area was dry and free of visible staining. The exposed insulation was clean and dry and the metal support structure was also clean. The sheetrock wall below the area was dry at 8 to 11% and free of visible staining.

Air samples taken in room G101 and two samples in the adjoining hallways (Samples 1, 2, and 3) all showed a ‘normal fungal ecology’.

Additionally, air samples were taken in the Hallways at Room 227 at Nags Head Elementary and at the Band Room in Manteo High School (Samples 4 and 5) which also showed a ‘normal fungal ecology’. Sample results can be seen in the table below and in the attached certificates of laboratory analysis.

SAMPLING METHODOLOGY

Air Samples:

Currently there are no regulations regarding acceptable airborne fungal levels. Airborne fungal spores are ubiquitous in the outdoor and indoor environment. The guidelines followed in this report for the assessment and/or remediation of airborne and surface fungi are published in *Bioaerosols: Assessment and Control*, by the American Conference of Governmental Industrial Hygienists (ACGIH), in *Mold Remediation in Schools and Commercial Buildings* by the United States Environmental Protection Agency (USEPA), in *Recognition, Evaluation, and Control of Indoor Mold* by the American Industrial Hygiene Association (AIHA), and in the ANSI/IICRC S520 *Standard and Reference Guide for Professional Mold Remediation, Third Edition (S520)*. Airborne fungal assessments are performed by comparing results from volumetric samples taken indoors to samples taken outdoors. Airborne fungi levels in non-problem indoor environments generally are less than or approximately the same as that outdoors and also show a similar composition and/or taxonomic predominance. Problems are usually implicated in the indoor air when one or more fungal genera or species are present in a much greater concentration indoors compared to outdoors. Sampling results are shown in the Certificates of Laboratory Analysis attached to this report. Results are discussed below.

SAMPLING RESULTS

Total Non-Viable Spore Air Sample Results:

Representative samples were taken for total airborne fungal spores with a calibrated Buck spore trap. Total airborne fungal spore sample volumes were 75-liters. The outdoor total fungal spore level (Sample 4) was measured at 893 Spores/m³ and was comprised of *Cladosporium* (51%), Basidiospores (28%), Ascospores (9%), *Penicillium/Aspergillus* group (6%), Smuts (3%), and 1% or less of various other fungal spores. The air sample results are summarized below in Table B.

Table B – Air Sampling Results

Sample #	Location	Total Airborne Spore Count (Spores/m³)	*Non-Fungal Background Particulate Level
01	Hall at F100	147	Low-moderate
02	Hall at A109	80	Low-moderate
03	G101	213	Low
04	Outdoor Air	893	Low-moderate
05	Hall at 227 (Nags Head)	413	Moderate
06	Hall at Band Room (Manteo)	147	Low

*The Background Particulate Level refers to non-fungal debris seen in the air sample; such as skin cells, hair, fibers, dust, dirt, etc.

The total fungal spore counts in the areas sampled indoors were lower than that found in the outdoor air. The types of fungal spores found in the indoor air samples were all common outdoor-type fungi present in low concentrations with no spikes in water loss fungi. Therefore, the results suggested a normal indoor fungal ecology in the areas sampled.

The particulate in the indoor air samples was in the Low to Moderate range. The particulate that we see in the microscope at the magnification used is usually called ‘course particulate’ and consist of many things and can include the following: dirt, dust, mold, pollen, fiber, hair, skin cells, dust mites and other insects. Fine particulates (to include VOC’s – volatile organic compounds) are not seen with the magnification used for these samples.

CONCLUSIONS

Results as reported by LRC apply only to the day of this inspection. LRC cannot and does not warranty that other parts of the structure were completely free or that the structure will remain free in the future from hidden sources of moisture or fungal contamination.

LRC’s visual inspection of the structure was as thorough as possible considering the nature of this investigation. It should be noted that conditions reported in this report were based on the time of the inspection only and circumstances may change following the inspection. Should further issues occur and conditions change it may be necessary to re-evaluate the structure and consider more in-depth testing.

The clearance requirements for this project were as follows:

- The primary clearance criterion was no visible fungal growth. The cleaned areas were inspected for removal of materials and that a thorough cleaning of any remaining surfaces had been completed to remove excess fungal spores, dust and debris.
- Clearance criteria for the non-viable spore trap air samples were as follows: the total fungal spore count should be lower than that found in the outdoor air. The fungal composition indoors should be similar to that found outdoors with no predominance of water-damage fungi indoors. The caveat to these criteria is if common water-damage fungi are present in the outdoor air samples, it is unreasonable to expect them to be excluded from the indoor sample.

The visual observations, moisture measurements, and air sample results reflect that of a normal indoor fungal ecology.

If you have any questions or concerns, please do not hesitate to contact us.

Sincerely,



Tony Richmond, BBA, CAI, WRT
LRC Indoor Testing & Research