

INDOOR ENVIRONMENTAL QUALITY TESTING

**GUILFORD COUNTY SCHOOLS
Oak Ridge Elementary School
Oak Ridge, NC**

Submitted To:

James Smith
Guilford County Schools
Maintenance Department
3920 Naco Road
Greensboro, NC 27401

Submitted By:

Brian Kareis
Workplace Hygiene, Inc.
445-C Dolley Madison Rd.
Greensboro, NC 27410

Date Mailed:

April 29, 2009

Project ID:

GCS040309

April 27, 2009

Mr. James Smith
Guilford County Schools
Maintenance Department
3920 Naco Road
Greensboro, NC 27401

Re: *Indoor Environmental Testing Report – Oak Ridge Elementary School- April 3, 6-9, 2009*

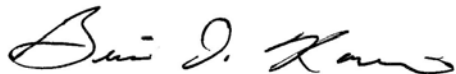
Dear Mr. Smith:

The enclosed report presents the results of the subject testing.

Please call me at 336.931.6207 if you have any questions or need additional assistance.

Thank you for the opportunity to provide this service.

Sincerely,

A handwritten signature in black ink, appearing to read "Brian D. Kareis". The signature is fluid and cursive, written in a professional style.

Brian D. Kareis, CIH, PE
Industrial Hygiene Services

Enclosure

INDOOR ENVIRONMENTAL QUALITY SURVEY REPORT
Guilford County Schools – Oak Ridge Elementary School
Mold and Long Term IAQ Testing
April 3, 6-9, 2009

BACKGROUND

Workplace Hygiene, Inc. was requested to conduct indoor air quality testing at Oak Ridge Elementary School located at 2050 Oak Ridge Road in Oak Ridge, North Carolina. The investigation was conducted indoor air quality testing within specific areas of the facility.

The testing was conducted on April 3, and 6-9, 2009. This investigation involved performing surface testing for fungal materials and long-term carbon dioxide testing in selected locations.

METHODS

Surface samples were collected by touching an adhesive coated microscope slide to a surface to be tested. The samples were collected from the underside of carpeting. The samples were submitted for laboratory analysis by direct microscopic analysis.

A bulk sample of carpet adhesive was collected and submitted for fungal culture analysis.

SAI, holding EMLAP accreditation from the American Industrial Hygiene Association, conducted surface and bulk sample analysis (SAI Reports 902828 and 902829 enclosed).

Long-term IAQ testing was performed using a KD Engineering AirBoxx Indoor Air Quality Monitor. The monitor continuously recorded temperature, relative humidity, and carbon dioxide levels in the areas tested for a one to two day period. Measurements were compared to ranges or limits recommended by the American Society of Heating, Refrigeration, and Air-Conditioning Engineers (ASHRAE)

FINDINGS

Surface and Bulk Samples

The surface sample results are summarized in Table 1. The table lists the sample numbers, locations, types of fungi found, and the relative surface prevalence of any fungi found. The analytical results can also be found in the Appendix. The results indicate that fungal materials were found in quantities indicating fungal growth on the backing of carpeting in the Assistant Principal's Office and in Classroom 520. The sample in the Assistant Principal's office was in the northwest corner of the office in a location that had become wet due to a leak. The samples in Classroom 520 were on the backing of carpet squares. One of the two samples indicated fungal growth. The backing had residue staining indicating that moisture, probably from carpet cleaning, had penetrated around the edges of the carpet squares and dried beneath them.

A bulk sample was collected of the adhesive beneath the carpet in Classroom 501. The results can be found in the Appendix (Sample B-1 – Spanish-Adhesive). The results did not indicate the presence of viable fungal material in the adhesive.

Indoor Air Quality Testing

The IAQ monitoring results for temperature, humidity, and carbon dioxide are summarized in the Appendix. The data is summarized for Classrooms 516 and 520. The Appendix also contains graphs on Figures 1 and 2 that show how these parameters changed over the monitoring periods. Temperature measurements indicated that the temperature levels were generally within the range normally recommended for occupant comfort. Relative humidity readings were generally within the 30-60 % recommended range for the first day of monitoring in Classroom 520, but decreased to a level below 30% by the end of the day on April 7th. This was due to a decrease in outdoor temperatures that resulted in a decrease in the overall air moisture level. The low humidity levels continued through the monitoring conducted in Classroom 516 on April 8th. Carbon dioxide levels exceeded the recommended limit of approximately 1,100 parts per million on the afternoon of April 6th in Classroom 520, but otherwise were below it for both Classrooms during the monitoring period.

CONCLUSIONS

Based upon this investigation, the following conclusions and recommendations are made:

- Surface testing indicated that the molds *Aspergillus* and/or *Penicillium* were present on samples collected from carpet backings in the Assistant Principal's Office and Classroom 520. According to school district personnel, the carpeting in the Assistant Principal's office has been replaced. The carpet squares in Classroom 520 and any other classroom with carpet squares should be replaced with carpeting that allows for better evaporation of moisture. The bulk sample from Classroom 501 did not indicate the presence of viable fungal spores.
- Indoor air quality monitoring indicated that temperature levels were within the recommended range, relative humidity levels were below the recommended range, and carbon dioxide levels exceeded the recommended limit for a portion of the monitoring period in Classroom 520, but apparently corrections were made to reduce carbon dioxide levels for the remainder of the monitoring periods.

Thank you for the opportunity to be of service. Please contact me at (336) 931-6027 if you have any questions concerning this report.

Submitted By:



Brian D. Kareis, CIH, PE
Industrial Hygiene Services

APPENDICES

Table 1 – Surface Sample Results
SAI Reports 902828 and 902829
Summary – Classroom 520 Air Quality
Figure 1 – Classroom 520 Air Quality
Summary – Classroom 516 Air Quality
Figure 2 – Classroom 516 Air Quality

**TABLE 1 – SURFACE SAMPLE RESULTS
OAK RIDGE ELEMENTARY SCHOOL
APRIL 3, 2009**

| Sample # | Location | Results – Relative Abundance | |
|----------|-----------------------------------------------|------------------------------|--------------|
| | | Fungal Types Identified | *Mold Growth |
| T-1 | Room 520 – Underside of Carpet Backing | Aspergillus/Penicillium | 3 |
| T-2 | Room 520 – Underside of Carpet Backing | None | None |
| T-3 | Assistant Principal's Office – Carpet Backing | Aspergillus/Penicillium | 4 |

** - Mold Growth is rated from 1 to 4 with 4 denoting the highest concentration. Miscellaneous spores present do not necessarily indicate mold growth.*