

October 1, 2014

MB3 99 RLP-297

Dr. Kimberly Tucker, Superintendent
Clay Community Schools
1013 S. Forest Ave.
Brazil, IN 47834

Dear Dr. Tucker:

The purpose of this letter is to report the result of our indoor air quality evaluation at Meridian Elementary School on September 16, 2014. This evaluation was conducted at Mr. Howard's request to address the health concerns of the occupants that may be related to indoor air quality of the school.

The Indiana State Department of Health's Microbiological Laboratory incubated and counted the fungal and bacterial units. The total colony forming units per cubic meter of air (CFU/M³) were computed by adding the fungal and bacterial counts, and dividing the sum by the total volume of the sampled air. Please refer to Table 1 for further details. Fungal counts outdoors were higher than any areas inside the building. There are no limits established as an acceptable concentration of fungal counts indoors. There are guidelines that recommend fewer counts indoors than outdoors.

The Carbon dioxide (CO₂) levels inside, were measured with the highest reading of 1992 parts CO₂ per million parts of air (ppm). The School Indoor Air Quality rule, 410 IAC 33-4-2 states; "*carbon dioxide concentrations in the breathing zone shall never exceed 700 ppm over the outdoor concentration*", in this case giving a limit of 1123 ppm. ASHRAE (American Society of Heating, Refrigeration, and Air Conditioning Engineers) recommends 15 cfm (cubic feet per minute) of outdoor air per person for classrooms.

The outdoor relative humidity was measured at 75 percent (%). The indoor relative humidity had a range between 63% and 68%. The American Society of Heating, Refrigeration and Air-conditioning Engineers (ASHRAE) recommend the relative humidity in habitable spaces preferably should be maintained between 30% and 60% to minimize growth of allergenic and pathogenic organisms. High humidity levels have been found to increase the population size of molds, fungi and mites that may cause allergies. The evidence suggests that humidity levels should be maintained between 40% and 50% to reduce the incidence of upper respiratory infections and to minimize the adverse effect on people suffering from asthma or allergies.

Such a range would be hard to maintain, however, exposure to higher or lower levels are unlikely to affect the health of most people.

Based on sample results and our visual inspection we note the following deficiencies:

- 1) **410 IAC 33-4-2 (b): states “carbon dioxide concentrations in the breathing zone shall never exceed 700 ppm over the outdoor concentration”.** Classroom 104 had a CO₂ level at 1922 ppm. This exceeded the carbon dioxide concentration limit of 1123 ppm. It is possible that the damper may be malfunctioning. Please take the necessary steps to ensure that sufficient outdoor air is being supplied into the classroom.
- 2) **410 IAC 33-4-4 Sec. 4 (b) states: “where provided air-conditioning systems shall be capable of providing and shall be operated to maintain a temperature not to exceed seventy-eight (78) degrees Fahrenheit and sixty-five percent (65%) relative humidity during periods of students occupancy”.** Relative humidity ranged from a low of 66% to a high of 68% inside the library and Rooms 103 and 104. At least two of the classrooms had exterior walls partially below ground level. The exterior walls in these rooms should be inspected to ensure moisture barriers are in place and there is proper drainage away from the building.
- 3) **410 IAC 33-4-6 (c): states “when a water leak or intrusion is discovered, corrective action shall be taken within forty-eight (48) hours”.** Stains were noticed on the ceiling tile above the unit vents inside the library and music room. An inspection should be done above the ceiling plenum for moisture intrusion. Please remove and replace water stained ceiling tile as they are discovered.
- 4) **410 IAC 33-4-6 (d): states “when mold or mold-contaminated material is discovered, corrective action shall be taken within forty-eight (48) hours. Mold is not to be growing in the school.** There was visible mold growth on one of the ceiling tile above the unit vent inside the music room. Please remove and replace the tile.

Please respond within 60 days of any actions you take based upon this report.

The School Indoor Air Quality rule 410 IAC 33-6-2 requires this report, and your response to this report, to be posted for 14 days at the location of the school building stated in the report so they are accessible to all students, parents, and employees.

Individuals experiencing any health problems should seek medical advice from a physician. If you have questions, please contact me at 317/351-7190 ext. 264

Sincerely,


RICK PLEW
INDUSTRIAL HYGIENIST
INDOOR AIR SECTION
ENVIRONMENTAL PUBLIC HEALTH DIVISION

Enclosure

TABLE 1

**Meridian Elementary School
410 N. Meridian Street
Brazil, IN**

**Computed Microbiological Air Sample Results
Taken September 16, 2014**

SAMPLE ID	LOCATION	NO. OF OCCUPANTS	RELATIVE HUMIDITY (%)	CARBON DIOXIDE (ppm)	AIR SAMPLED (liters)	FUNGAL COUNT (CFU/M ³)	BACTERIAL COUNT (CFU/M ³)	TOTAL COUNT (CFU/M ³)
12	Library	4	67	527	100	80	30	110
13	Room 103	2	66	912	100	110	40	150
14	Music Room	21	63	911	100	210	60	270
15	Room 104	18	68	1992	100	310	150	460
16	Outdoor	-	75	423	100	540	120	660

% -----percent

ppm-----parts per million

CFU/M³—colony forming units per cubic meter of air