

June 4, 2015

MB3-99-RLP-#307

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 Forest Park Elementary School on May 26, 2015. This evaluation was conducted at the request of a concerned citizen 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/M<sup>3</sup>) 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 inside the building were lower than the outdoors. 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 (CO<sub>2</sub>) level was measured inside the classrooms. The highest carbon dioxide level measured was 1228 parts CO<sub>2</sub> 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 1082 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 80 percent (%). The indoor relative humidity was between 57% and 72%. 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. Humidity levels above 50% 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 our visual inspection and sample results, the following deficiencies were noted during the inspection:

- 1) **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”.** A ceiling tile in the SE corner of classroom B-144 was stained. Please inspect above the ceiling plenum for leaks.
- 2) **410 IAC 33-4-2 (b): states “carbon dioxide concentrations in the breathing zone shall never exceed 700 ppm over the outdoor concentration”.** Classrooms A-105, B-138, B-143, and B-144 exceeded the carbon dioxide concentration limit of 1082 ppm. Please ensure there is a sufficient amount of outdoor air being supplied into the classrooms.
- 3) **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”.** The relative humidity inside classroom A-105 was measured at 72%. The outdoor relative humidity was measured at 80%. Due to the close proximity of classroom A-105 and exit door #9, it is possible the outdoor weather conditions may have influenced the relative humidity level inside the classroom. One solution to lower the humidity inside the classroom would be to operate a dehumidifier inside the classroom on days when outdoor humidity levels exceed 65%.

The relative humidity inside classroom C-121 was measured at 65%. We recommend the humidity be closely monitored and not exceed 65%.

Individuals experiencing any health problems should seek medical advice from a physician.

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.

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**

**Forest Park Elementary School  
800 S. Alabama Street  
Brazil, IN 47834**

**Computed Microbiological Air Sample Results  
Taken May 26, 2015**

SAMPLE ID	LOCATION	NO. OF OCCUPANTS	RELATIVE HUMIDITY (%)	CARBON DIOXIDE (ppm)	AIR SAMPLED (liters)	FUNGAL COUNT (CFU/M <sup>3</sup> )	BACTERIAL COUNT (CFU/M <sup>3</sup> )	TOTAL COUNT (CFU/M <sup>3</sup> )
1	Rm. B-144	4	57	463	100	420	80	500
2	Rm. B-143	4	63	437	100	370	70	440
3	Rm. B-138	3	60	448	100	460	70	530
4	Rm. A-105	2	72	456	100	390	30	420
5	Outdoor	-	80	450	100	1800	30	1830
6	C-121	4	65	436	100	210	10	220

**Notes:**

**% -----percent**

**ppm-----parts per million**

**CFU/M<sup>3</sup>—colony forming units per cubic meter of air**