

Illinois Department of
**Public
Health**

John R. Lumpkin, M.D., M.P.H., Director

525-535 West Jefferson Street • Springfield, Illinois 62761-0001

#901129501

June 6, 1995

Ms. Sue Kumuda
School District #181
Buildings and Grounds
120 W. Walker
Clarendon Hills, IL 60514

Dear Ms. Kumuda:

The Illinois Department of Public Health (IDPH) has completed a follow-up evaluation of indoor air quality (IAQ) at the Hinsdale Middle School, Hinsdale, Illinois on May 17, 1995. Bioaerosol sampling and a brief walk-through indoor air survey were conducted from 2 to 3:30 p.m.

Bioaerosol sampling was conducted in response to previous recommendations. Baseline bioaerosol sampling was carried out in January, however the dry conditions associated with winter are not conducive to microbial growth. Although there was occasional evidence of water damage, there was no visible mold growth in the school, and no mold-like odors were present. The January sampling indicated that bioaerosol levels were extremely low in the areas tested and that there was no significant difference between complaint and non-complaint areas. The highest concentration, 35 colony-forming units per cubic meter (cfu/m³), was found in the commons area.

Bioaerosol sampling was conducted using an Anderson sampler and agar plates. Ten samples were collected, maintained at room temperature, and incubated at IDPH labs in Springfield, where they were read by a staff microbiologist. Total colony forming units were reported and air concentrations were calculated using this data and the sampling air flow rate. The results of the sampling are shown on Table One. The carpeted commons area has been identified as a area of possible microbial contamination. Our sampling did not find the commons area microbial levels to be higher than a non-complaint area (maintenance) or outdoor levels. The slightly elevated level detected in the air handling room represents only one more colony forming unit than the outdoor sample, and is not statistically significant enough to cause concern. In fact, considering the volume of outdoor air drawn through this room, a microbial level at or slightly exceeding outdoor levels is to be expected. Please keep in mind that this bioaerosol sampling is merely a "snapshot" of air conditions that can change from day to day inside a building.

While in the air handling room we observed that a filter grate through which all air entering the system passes had several clogged holes. This would reduce the volume of outdoor make-up air entering the HVAC system.

The results of the brief walk-through IAQ survey are shown in Table Two. The outdoor temperature and relative humidity at the time of the survey were typical for spring in Northern Illinois. Since CO₂ is a normal constituent of exhaled breath, measurements can be used to determine if the quantity of outdoor air that is being delivered to occupants is adequate. High concentrations of CO₂ indicate that outside air is not being adequately supplied to the building to mix with recirculated air. If indoor CO₂ concentrations are more than 1,000 parts per million (ppm), complaints such as headaches; fatigue; and eye, nose and throat irritations may be anticipated. The ASHRAE *Ventilation for Acceptable Indoor Air Quality* (62-1989) guideline recommends that school classrooms be supplied with 15 cubic feet per minute (CFM) of outside air per person. This volume of make-up air roughly corresponds with a CO₂ concentration of 1,000 ppm.

The elevated CO₂ concentration itself is not responsible for the complaints; however, high CO₂ concentrations are indicative of stale, stagnant air, which does contribute to occupant complaints. During this walk-through IAQ survey, elevated CO₂ levels were noted in Room 110 and in the computer room located adjacent to the learning center. This indicates that even when outdoor conditions are mild and the HVAC system is drawing large quantities of outdoor air, the volume of this make-up air is not adequately supplied to all areas of the school. Relative humidity and temperature were within normal comfort parameters in all of the rooms tested.

Based on this follow-up sampling, IDPH recommends the following:

1. Make sure make-up air is adequate to meet the ASHRAE guideline of 15 CFM per occupant.
2. Clean air intake grates to improve the flow of outdoor air into the HVAC system.
3. Maintain regular inspection of the condensation drains during the cooling season to insure minimal water accumulation in the air handling units.

If you have any questions or require additional information, feel free to contact us at (217) 782-5830.

Sincerely,



K. D. Runkle
Toxicology Section

cc: DuPage Co. Health Dept.
IDPH W. Chicago Regional Office

TABLE ONE -- H.M.S. BIOAEROSOL SAMPLING
May 17, 1995

| AREA SAMPLED | MICROBIAL LEVEL (cfu/m3) |
|--------------------|-----------------------------|
| OUTDOORS | 314 |
| Air Handling Room | 331 |
| Upper Commons Area | 70 |
| Lower Commons Area | 105 |
| Room 110 | 35 |
| Maintenance Area | 105 |

cfu/m3 = colony forming units per cubic meter

TABLE TWO -- H.M.S. WALK-THROUGH INDOOR AIR SURVEY
2 to 3:30 p.m., May 17, 1995

| AREA SAMPLED | CO ₂ LEVEL (ppm) | TEMPERATURE (F) | RELATIVE HUMIDITY |
|---------------------------|--------------------------------|--------------------|-------------------|
| OUTDOOR CONDITIONS | 370 | 64.0 | 33.0 |
| FIRST FLOOR | | | |
| Maintenance Area | 750 | 75.1 | 34.2 |
| Commons Area | 800 | 70.8 | 36.1 |
| 110 french room | 1,090 | 70.3 | 41.2 |
| SECOND FLOOR | | | |
| Room 211 * | 860 | 71.2 | 35.0 |
| library | 740 | 70.7 | 32.3 |
| computer room (off LC) | 1,010 | 71.5 | 33.3 |
| Room 216B | 870 | 71.2 | 32.4 |
| THIRD FLOOR | | | |
| Air Handling Room | 570 | 74.1 | 27.5 |
| Gymnasium | 720 | 74.0 | 35.0 |

ppm = parts per million

* students recently dismissed, four teachers were present