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Environmental Scientists and Engineers  
*"Protecting People and the Environment"*

**CONFIDENTIAL**

October 23, 2001

Gary Martin, *Director of Facilities*  
 Westport Public Schools  
 110 Myrtle Avenue  
 Westport, CT 06880

Dear Mr. Martin:

A limited indoor air quality study was conducted at Kings Highway Elementary School. The study consisted of continuous measurement of carbon dioxide concentration, temperature, and relative humidity over one school day for seven selected rooms using a TSI Incorporated Q-Track monitor model 8550. The results can be used to evaluate the performance of the room's environmental controls.

Carbon dioxide concentration is an indicator of whether or not the exchange between indoor and outdoor air is sufficient to keep up with the respiratory load and body emissions of the occupants. Standard air is considered to contain 300 ppm at sea level and as much as 600 ppm in cities. The recommended ventilation guideline is 1000 ppm. Carbon dioxide is not a toxic gas, but can depress respiration above 25,000 ppm. OSHA permits 10,000 ppm in work environments where carbon dioxide is used. Air exhaled by people is typically 40,000 ppm. Carbon dioxide concentrations above 1000 ppm indicate conditions that cause drowsiness and unrelated symptoms, such as headache, to seem worse. Levels above 2000 indicate conditions where a significant improvement in indoor air quality can be achieved by improved ventilation. Levels from 1000 to 2000 indicate increasing improvements in air quality with increased ventilation. A graph labeled "CO<sub>2</sub>, ppm" on the left axis is enclosed for each room tested. Some statistics for each room are presented in the table below. The results should be correlated with occupancy and ventilator settings for complete interpretation, but in general, increased fresh air would improve indoor air quality in all but one of the rooms tested.

**CO<sub>2</sub> Statistics**  
**9AM - 3PM time period**  
 (ppm)

|  | Room         | Average | Low  | High | % time above 1000 |     |
|--|--------------|---------|------|------|-------------------|-----|
|  | 1 - Monte    | 3       | 1257 | 895  | 1660              | 84% |
|  | 2 - Loss     | 11      | 1233 | 554  | 2336              | 62% |
|  | SPED         | 18      | 670  | 526  | 805               | 0%  |
|  | 3 - Trausiew | 24      | 799  | 473  | 1392              | 17% |
|  | 4 - Olbrych  | 26      | 1063 | 762  | 1606              | 50% |
|  | 2 - Stern    | 33      | 1543 | 992  | 1972              | 88% |
|  | K - Cooper   | 105     | 1006 | 720  | 1423              | 36% |

Temperature is a general comfort factor for indoor air quality. Individual response is highly subjective and depends on many other factors. A graph labeled "Temp, deg F" on the left axis is enclosed for each room tested. Some statistics for each room are presented in the table below.

**Temperature Statistics**  
**9AM - 3PM time period**  
(degrees Fahrenheit)

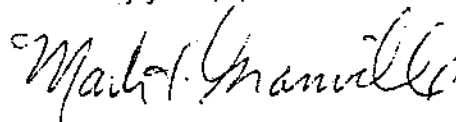
| Room | Average | Low  | High |
|------|---------|------|------|
| 3    | 69.6    | 67.8 | 71.5 |
| 11   | 75.2    | 73.7 | 77.0 |
| 18   | 78.2    | 75.2 | 79.9 |
| 24   | 77.2    | 73.8 | 79.3 |
| 26   | 76.2    | 73.9 | 77.9 |
| 33   | 69.5    | 66.3 | 72.4 |
| 105  | 74.3    | 73.4 | 75.1 |

Relative humidity is also a general comfort factor for indoor air quality. Individual response is highly subjective and depends on many other factors. Relative humidity above 70% is considered high and below 20% is considered dry. A graph labeled "rh, %" on the left axis is enclosed for each room tested. Some statistics for each room are presented in the table below.

**Relative Humidity Statistics**  
**9AM - 3PM time period**  
(%)

| Room | Average | Low  | High |
|------|---------|------|------|
| 3    | 40.5    | 39.5 | 41.9 |
| 11   | 51.1    | 45.5 | 54.5 |
| 18   | 39.5    | 33.4 | 48.6 |
| 24   | 40.1    | 36.3 | 46.7 |
| 26   | 35.6    | 34.0 | 37.3 |
| 33   | 52.2    | 47.7 | 54.7 |
| 105  | 30.6    | 27.8 | 32.0 |

Sincerely yours,



Mark F. Granville  
Lab Director, New Haven

enclosures  
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