

October 8, 2014

Casey Waletich  
Hillsboro School District  
3083 NE 49<sup>th</sup> Place  
Hillsboro, OR 97124

Subject: Indoor Air Quality

Dear Casey:

Indoor air quality assessments were conducted on September 30, 2014 at Hillsboro School District's Indian Hills Elementary School. The assessment concluded that at the time of my visit there was no indication that the indoor air quality would pose a health risk for employees or students. Included you will find my report outlining what was found during the assessment as well as recommendations to help improve the quality of your schools indoor air quality.

If you have any questions or need for further loss control assistance please don't hesitate to call me at (800) 285-5461.

Sincerely,



Troy D. DeYoung  
Risk Management Consultant

cc: Yvonne Dukart  
Dave Peterson  
Propel



## Indoor Air Quality Assessment

Date of Visit: September 30, 2014  
District: Hillsboro School District  
Person Conducting Visit: Troy DeYoung  
Contact: Casey Waletich

### Summary

On September 30, 2014, SDAO Risk Management Consultant Troy DeYoung performed an indoor air quality (IAQ) assessment at Hillsboro School District. The assessment was completed at Indian Hills Elementary School. The assessment was conducted due to a staff member complaining of indoor air quality concerns. I was accompanied by maintenance employee Dave Peterson.

**The assessment revealed there were no immediate concerns that conditions would be unsafe for employees.**

### Sample Environment

Indian Hills Elementary School provides educational space for kindergarten through sixth grade. The concerns were reported in music classroom side of the modular building. We were able to visit with staff in the other side of the modular and they reported no concerns related to IAQ.

### Sampling Methodology

#### Carbon Dioxide, Carbon Monoxide, Temperature and Relative Humidity

A Fluke 975 AirMeter data logging IAQ monitor was used to evaluate carbon dioxide, carbon monoxide, temperature and relative humidity. These parameters are used to evaluate the overall air quality and comfort levels of the indoor air. The unit is calibrated monthly by SDAO staff and is equipped with a startup self-diagnostic test. The unit was within the calibration period and passed the self-diagnostic test.

#### Moisture

A GE Sensing Surveymaster Protimeter Dual-Function Moisture Meter was used to evaluate moisture level of non-conductive and porous construction materials. The meter operates on the principle of electrical impedance measurement to give accurate moisture readings for many types of materials.

### Results

#### Carbon Dioxide

The carbon dioxide levels tested in the music room ranged between 747 ppm with the classroom door open and 959 ppm with the door closed. The American Society of Heating, Refrigeration, and Air-conditioning Engineers (ASHRAE) recommend maintaining indoor carbon dioxide concentrations below 1000 ppm for classroom environments and below 800 ppm for office environments. It is important to remember that carbon dioxide is not a toxin but is a constituent in exhaled breath, and is used as an indicator in determining whether or not adequate amounts of outside make-up air are entering an area. In a building with insufficient make-up air, carbon dioxide levels can build up without adequate dilution. Symptoms in buildings with high carbon dioxide levels involve sleepiness, headaches, excessive fatigue, and eye irritation. The sampling results indicate that adequate amounts of fresh air are being provided to the building by the ventilation system.

### Carbon Monoxide

No Carbon Monoxide was detected during the assessment. Symptoms of mild poisoning include headaches and dizziness at concentrations less than 100 ppm. OR-OSHA permissible exposure limit (PEL) is 50 ppm. Carbon monoxide is produced from the partial combustion of carbon-containing compounds, notably in internal-combustion engines. Carbon monoxide is a significantly toxic gas and has no odor or color. It is the most common type of fatal poisoning in many countries. Exposures can lead to significant toxicity of the central nervous system and heart.

### Temperature

The temperature of the building ranged from 67.1°F to 68°F. OSHA technical manuals recommend temperature for a comfortable indoor work environment range between 68°F and 76°F. Though one of the readings was slightly below this range it is not thought that this is a current concern.

### Relative Humidity and Moisture

The relative humidity of the building was between 51% and 53% and there was no visible indication of any current moisture problems. There was some staining on one section of the wall and several ceiling tiles caused from previous moisture problems in the classroom. The day of the visit there was some light rain in the morning but no significant long down pours. OSHA technical manuals recommend maintaining the relative humidity between 20% and 60% to help control mold. Molds can be found almost anywhere; they can grow on virtually any substance, providing moisture is present. Molds can grow within wood, paper, carpet and foods. When excessive moisture accumulates in buildings or on building materials, mold growth will often occur, particularly if the moisture problem remains undiscovered or unaddressed. There is no practical way to eliminate all molds and mold spores in the indoor environment. The key to control indoor mold growth is to control moisture. If mold is discovered, clean it up immediately and remove excess water or moisture.

### **Conclusions/Recommendations**

- As a result of the visit and the readings captured the IAQ should provide for a safe work environment.
- Noted during the visual inspection
  - As the rainy and wet season begins to set in the District should monitor the modular to ensure that there are no current water intrusion issues.
  - The downspouts on the modular building currently terminate at the ground level next to the modular. This may be allowing water to pool under the modular which in turn promotes mold and mildew growth as well as breeding grounds for insects. Consideration should be given to directing the downspout runoff away from the building.
  - The skirting around the modular building has some holes and gaps between the skirting and the ground that can allow animals to enter. The skirting should be repaired to prevent access by animals that may nest under the building.

# Indoor Air Quality Assessment

Meter ID: **FLUKE 975 1B 92980016**

District **Hillsboro School District  
Indian Hills Elementary**

<b>Start Time</b>	9/30/2014 1:33:08 PM					
<b>Stop Time</b>	9/30/2014 1:46:00 PM					
<b>Elapsed Time</b>	0:12:52					
<b>Interval</b>	manual					
<b>Total readings</b>	4					
<b>Session Name</b>	Saved Readings					
	<b>Max Time</b>	<b>Max</b>	<b>Average</b>	<b>Min</b>	<b>Min Time</b>	<b>Scaling</b>
<b>Temperature</b>	9/30/2014 1:37:54 PM	74.3 °F	73.6 °F	73.4 °F	9/30/2014 1:33:08 PM	(none)
<b>Wet Bulb</b>	9/30/2014 1:33:08 PM	61.7 °F	61.7 °F	61.7 °F	9/30/2014 1:33:08 PM	(none)
<b>Dew Point</b>	9/30/2014 1:33:08 PM	55.4 °F	55.0 °F	54.5 °F	9/30/2014 1:37:54 PM	(none)
<b>%RH</b>	9/30/2014 1:33:08 PM	54.0 %	52.4 %	50.9 %	9/30/2014 1:46:00 PM	(none)
<b>CO</b>	9/30/2014 1:33:08 PM	0 ppm	0 ppm	0 ppm	9/30/2014 1:33:08 PM	(none)
<b>CO2</b>	9/30/2014 1:46:00 PM	959 ppm	808 ppm	747 ppm	9/30/2014 1:33:08 PM	(none)

	Temperature	Wet Bulb	Dew Point	%RH	CO	CO2	Timestamp
1	73.4 °F	61.7 °F	55.4 °F	54.0 %	0 ppm	747 ppm	9/30/2014 1:33:08 PM
2	73.4 °F	61.7 °F	55.4 °F	53.1 %	0 ppm	756 ppm	9/30/2014 1:34:49 PM
3	74.3 °F	61.7 °F	54.5 °F	51.5 %	0 ppm	769 ppm	9/30/2014 1:37:54 PM
4	73.4 °F	61.7 °F	54.5 °F	50.9 %	0 ppm	959 ppm	9/30/2014 1:46:00 PM
5							
6							
7							
8							
9							
10							

**Comments**

Temperature  
%RH

Wet Bulb  
CO

Dew Point  
CO2

