

Indoor Air Quality in Northwest Schools

**An electronic newsletter for school Indoor Air
Quality (IAQ) exclusively for Northwest schools**

Winter Quarter 2004

“Today, IAQ committees exist in each building rather than district wide and consist of the building principal and at least two other staff members.”

Riverside School District Indoor Air Quality Program

*By Galen Hansen, Superintendent,
Riverside School District,
Chattaroy, Wash.*

Riverside is a progressive, growing district that in past years faced serious indoor air quality issues. Located approximately 17 miles north of Spokane, Wash., the district today has those issues “in check,” and continues to follow solid indoor air quality practices.

Four years ago, Riverside began to work with Rich Prill and David Hales, both of the Washington State University Extension Energy Program, and Eric Dickson, an industrial hygienist with Educational Service District 101, to establish an IAQ program that works, is manageable and protects the well-being of staff and students.

Initially, a district wide IAQ committee was formed with two representatives from each building. This committee established an IAQ handbook that was simple, provided direction and helped establish solid answers to problems. A member of the maintenance department and the custodial supervisor were added to the committee to help address issues regarding maintenance and cleanliness. The committee was trained regarding “what to look for” and how to address IAQ issues.

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School Indoor Air Quality Newsletter for Northwest Schools

A quarterly electronic newsletter exclusively for NW schools.

Please circulate this subscription opportunity throughout the Northwest to those who may be interested.

There are two ways to subscribe:

1) To view the newsletter, click here:
<http://www.energy.wsu.edu/buildings/IAQ.htm>

The newsletter contains a link for subscription information.

2) Or, send a blank email message to: subscribe-iaq@listserv.energy.wsu.edu

You will receive a confirmation message. When you reply to that message you will be subscribed and will receive all future postings. You can easily unsubscribe at any time.

This broadcast email list not only provides automatic delivery of the quarterly School IAQ Newsletter, but includes announcements about news of interest, training events, grant opportunities, and other information useful to school districts, agencies, and stakeholders involved in school IAQ and operations and maintenance.

The newsletter is an opportunity for all interested parties to communicate, and add to the collective wisdom.



Upcoming Events:

EPA's Annual IAQ Tools for Schools Symposium Set for December 2-4, 2004 in Washington, D.C.

This is an excellent annual event that provides great presentations and a unique opportunity to network with school folks from across the nation.

A brochure is now available at www.epa.gov/iaq/schools.

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Riverside School District

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members. When an IAQ issue arises the committee immediately responds with the assistance of the maintenance and/or custodial supervisors. Staff members experiencing any kind of IAQ concern have an interview with one member of the committee, while the rest of the committee follows training procedures to discover what the problem or issue is. Based on the recommendation of the committee the situation is either resolved or Industrial Hygienist Eric Dickson is called in to evaluate and test the area.

Walk-throughs are conducted each year by each building principal with the assistance of the maintenance and custodial supervisors. Every three years the district utilizes the expertise of individuals such as Rich, David and Eric to do a comprehensive walk-through where issues are identified and then prioritized by the committee. The IAQ committee then determines how to solve and finalize each issue. Our staff see these events as a unique and valuable training opportunity and a quality control check. This format is a proactive and preventative maintenance approach that sends a clear and positive message to all. Having to be reactive costs much more and does not insure the well-being of staff and students.

Since cleanliness is one of the best preventative practices to guard against IAQ problems, the custodial staff work schedule was organized into 15-minute increments. Proper training and accountability to this regimented schedule has helped make a difference – our custodians are doing a better job with less stress. The maintenance staff provides immediate attention to problems such as water intrusion, air movement, amount of outside air delivered, housekeeping, any odd smells, and testing of areas where IAQ issues develop or appear to be a concern.

Example: A water leak occurs involving ceiling tiles, sheet rock walls and carpeting. The sheet rock is immediately removed and replaced. The carpet is cleaned and dried to prevent mold. The leak or problem is fixed and ceiling tiles replaced.

Each building is also on a rotation for duct cleaning, ceiling tile cleaning and/or replacement, especially in areas where recessed ceilings are utilized as return air ducts.

Riverside School District could not have accomplished such a viable IAQ program without the assistance of the U.S. Environmental Protection Agency, Region 10; the WSU Extension Energy Program; and ESD 101. We wish to take this opportunity to thank each organization and the extra special efforts of Rich Prill and Eric Dickson.

Mt. Erie Elementary School Implements a Novel Program

By Von Storme, Head Custodian,
Mt. Erie Elementary, Anacortes, Wash.

Greetings! Here is a "Green Cleaning" update from Mt. Erie Elementary. Around Christmas we presented a challenge to our students to see who could do the best job of cleaning their classroom on a daily basis. Students are asked to "pick up" the floor, put up their chairs at the end of the day and wipe their feet before they enter the building.

My custodian Cathy and I inspect the rooms every day when we go in to vacuum. We keep a chart and all the classrooms that have done a great job earn a (+) for the day. Those who have left a mess earn a (-) for the day. A minus cancels out a plus.

At the end of the week we add up all the plus marks. The class with the most plus marks receives a trophy for their classroom for a week.

We have three trophies that our PTA purchased for us so we divided the school into three groups: K-1st, 2nd-3rd, and 4th-6th grades. We also keep a chart for who has the trophy each week. At the end of the year the class that has had it the most times over the year will receive an ice cream party from Von and Cathy.

Cathy and I have had such a GREAT response from this that it is difficult to judge. One pencil on the floor may keep a class from earning a plus for the day.

This program helps by giving us more time to do deep cleaning in the building, and in turn gives us a cleaner and healthier environment. The children are learning to be responsible for their own space and to take pride in their school. We also helped teachers and students organize their rooms for easy cleaning by placing items in plastic containers.

Cathy and I have had some positive feedback from staff members, volunteers and parents who have felt better this year than they have in the past. Some who have severe allergies or asthma have reported they have not had a case of bronchitis or an asthma attack so far this year, and normally they would have been on antibiotics one or more times by now.

Comments have been made by some of our specialists who aren't here every day that it seems easier to breathe in our building this year and there isn't a stale air smell in the building. Our maintenance department reported that the filters in our heating, ventilation and air conditioning system were much cleaner this year.

We are attributing these positive results to the fact that we replaced all of the old carpeting in our building last summer and have changed all of our cleaning products to Envirox H2 Orange2 products, which have a Green Seal certification. All of these things have taken us a little while to put into practice but we are beginning to reap the benefits. We are extremely proud

of our staff and students.



Clean Classroom Trophy



Example of an organized and "cleanable" classroom



Von and Cathy (Note the Tools For Schools Certificate and Outstanding Custodial Award.)

Creating an IAQ Program for Your School District

By Dave Blake, Northwest Air Pollution Authority, Mt. Vernon, Wash.

Starting an effective indoor air quality program from scratch in any school district can be a daunting task. If the U.S. Environmental Protection Agency's IAQ Tools for Schools Action Kit seems like too much material to digest all at once, consider the 3-step approach to implementing the TfS kit. (Contact Rich Prill at prillr@energy.wsu.edu for a copy; it will be posted soon at www.energy.wsu.edu, under Building Science, for easy downloading).

This 3-step "jump-start" process has been discussed quite thoroughly in past issues of this newsletter, still available online at www.energy.wsu.edu/projects/building/iaq_nl.cfm. Even using the streamlined approach to launching an IAQ program for your school or district involves some work above and beyond your normal duties. Therefore, I would say it takes a person with some special qualities: commitment to the cause; a desire to learn; and, above all, patience.

I know dozens of individuals who fit this description right here in the Northwest corner of Washington State. They all got the IAQ program that they wanted and that works for their school.

I want to take the opportunity (and some editorial license) to pass along some general guidance to keep in mind during the process. Other perspectives and experiences are welcome and encouraged, and will be presented in future issues – send them along!

First, get some training and help. You can get training on IAQ by attending an EPA IAQ Tools for Schools workshop in your area. Lacking travel money to get to a workshop, you can learn a lot by reading through the Tools for Schools Action Kit. You can get a free TfS Kit on compact disk from EPA by calling 1-800-438-4318, or online at www.epa.gov/iaq/schools.

You may apply to get a scholarship to attend the annual Tools for Schools Symposium in Washington, D.C., Dec. 2-4, 2004 (see the EPA website above). You may be lucky enough to get a trained expert to come to your school and advocate for you. Contact Ann Wawrukiewicz at EPA (206-553-2589, or wawrukiewicz.ann@epa.gov) to see who

might be able to help you for little or no cost.

Ultimately, you want to have your basic arguments ready as to why creating an IAQ program is important. If you have had a crisis related to IAQ already, your arguments are obvious, but your job will no doubt be more complex. I hope it won't take a crisis to motivate creation of an IAQ program.

Second, identify your allies. You will know who in your school or district is likely to share your views. The school nurse, for example, will have some knowledge about IAQ. Ultimately, you will want to get your facilities staff on board. Introduce them to the 3-step approach to implementing the TfS kit. We have had good luck with facility managers because they tend to be well aware of the pitfalls of doing nothing regarding IAQ in a school district. They may be looking for allies, too.

Plus, even though creation of an IAQ program typically involves some additional work for facilities staff, it tends to stabilize or increase maintenance budgets. This is because with greater awareness of IAQ comes the understanding that effective maintenance and good air quality go hand in hand. We have great luck implementing IAQ procedures, conducting school walk-through evaluations, improving air filtration and ventilation by working at the facility manager level. If you want a formal program or written policy, however, you need the principals and superintendent on board.

Third, woo the administrators.

Here is where patience comes in. I have found principals and administrators to be among the most overburdened and harassed people I have ever encountered. They have an extremely diverse and difficult job. Adding consideration of adopting an IAQ program to their list may not get the response you hope for the first time around.

Concerns about finding problems the district has no money to fix can be a concern. Emphasize that typically much progress is made via low- or no-cost solutions.

Concerns about drawing attention to IAQ and

“creating problems” can be a worry. Working with a couple hundred schools in the Northwest, Rich Prill, of the Washington State University Extension Energy Program, and I have never (openly) been accused of causing trouble. Be patient.

Don't burn any bridges. For example, I would advise against attempting to shame an unresponsive administrator into action. Keep your conversations friendly and respectful. Administrators may not understand the importance of IAQ (remember that many doctors don't yet understand), but that does not mean they are incapable of it, given time. We are working top down at the state level to help inform administrators about IAQ and regional success stories.

The better approach is to offer references to successful programs in other districts, even if they are in another state. There are many facility managers who would be willing to discuss the costs and benefits of formal IAQ programs with your administrators. Based on our experience, I can tell you confidently that the benefits clearly outweigh any costs.

One convincing argument is that healthier learning environments lead to higher student scores on standardized tests. A perhaps shallower but very real point is that knowledge of IAQ and experience with IAQ program development looks great on an administrator's (or facility manager's) resume.

If you are still unsuccessful, back off and bide your time. Accomplish what you can on a smaller scale in schools or classrooms that welcome your attention. If complaints about indoor air quality surface, your administrators will remember who was offering assistance along that line and they will likely come back to you.

Down the road a little ways, everyone will be on board with IAQ programs. That is the inescapable trend and the ultimate good news.

Again, send your stories and experiences to me at dave@nwair.org, or to Rich Prill at prillr@energy.wsu.edu, so they can be shared with others.

Mold and Moisture in Buildings Workshop Coming to Seattle March 11

The workshop will be held from 8 a.m. to 4:30 p.m., Thursday, March 11 at the Mountaineers Building, 300 Third Ave. W. Advance registration is required at a cost of \$75 before March 4, \$80 after. Lunch is provided. You can download a brochure at <http://yosemite.epa.gov/R10/AIRPAGE.NSF/webpage/Mold+and+Moisture+Workshop>. Or call the American Lung Association of Washington at 206-441-5100.

Topics to be covered:

- What mold is and what causes it;
- Health effects of mold exposure;
- Building dynamics and moisture;
- Mold investigation;
- When is testing necessary?
- Mold remediation and protocols;
- Building design and materials;
- Preventing moisture and mold growth; and,
- Legal issues regarding mold.

This workshop will provide an excellent overview of moisture and mold issues for school personnel. The workshop is sponsored by the U.S. Environmental Protection Agency, Region 10; the Lung Association of Washington, and the Washington State University Cooperative Extension.

Wet Sheetrock and How to Deal With It

Recently, schools in Eastern Washington experienced a week of very cold weather that resulted in numerous incidents of frozen water pipes and thus a water event. This isn't just a concern for schools located in the path of winter storms – in almost every instance of water intrusion we recommend the removal of all wet sheetrock (wallboard).

Listed below are some things to consider when you have a broken water pipe, fire sprinkler pipe, roof leak or other form of water intrusion. The U.S. Environmental Protection Agency and others advise sheetrock should be thoroughly dried in the first 24-48 hours to avoid mold growth. Here at Educational Service District 101, we typically are not called until a couple of days after the flood or leak has occurred, so we're already behind on the 48-hour time frame. If the moisture meter detects moisture in the sheetrock, it doesn't make sense to take a chance and not replace the sheetrock.

This is especially true if there is vinyl wallpaper involved. Vinyl wallpaper on wet sheetrock is almost a guarantee that mold will grow. Since vinyl wallpaper forms a vapor barrier, there is virtually no way to dry out the sheetrock behind the wallpaper. Sheetrock is very inexpensive. School personnel or a qualified drywall contractor can complete a small job in a few hours. Replacing wet wallboard is cheap insurance against mold growth and the problems associated with it.

Opening up the wall also provides proof to staff that there is no hidden mold behind the walls. This relieves valid concerns about future health problems. If wet sheetrock, insulation and other materials are removed before mold starts to grow,

it is merely a sheetrock replacement project versus a mold abatement project. The risk is not worth the reward in leaving wet sheetrock in place. Several school districts in Washington State have learned the hard way what can happen when mold becomes an issue.

Insulation inside the wall brings another variable or complexity. Insulation is very difficult to completely dry out and restricts airflow inside the wall cavity. In this case, the bottom of the wall may still need to be replaced. Leaving a source of moisture inside a wall cavity is never a good idea. We recommend cutting the sheetrock four feet up from the floor to provide for thorough inspection, ventilation, replacement of wet insulation and easy sheetrock replacement.

HOW TO SAVE WET SHEETROCK

Wet sheetrock might be dried and saved if these steps are taken within 24-48 hours:

- Remove all base cove material from affected walls immediately. Some base cove adhesives will support mold growth and thus need to be dried immediately. Also, the area behind the base cove allows ventilation holes to be drilled and easily finished by simply replacing the cove material.
- Drill holes (3/4 inch or larger) into the sheetrock at the base cove level, between wall studs, to get air moving inside the wall cavity. Use fans to facilitate air movement.
- If both sides of the sheetrock can be dried right away, the sheetrock might be saved. The base cove can be replaced and will cover the holes without any visible damage.
- Drill holes into the wood base material of cabinets, casework, etc. Contractors occasionally use the space under cabinets as a trash bin leaving behind cabinet struts, paper, rags and other debris, all of which can grow mold when wet. Holes can be finished with round aluminum vents, available at hardware stores, which provide permanent ventilation.



- Bases of cabinets, as well as the cabinets themselves, are typically made of particleboard, which contains formaldehyde. When particleboard gets wet, off-gassing of formaldehyde will occur. Often, this vapor adversely affects sensitive individuals.
- If the space under cabinets and casework can be thoroughly ventilated, release of formaldehyde, as well as any potential mold growth, can be minimized.

Sheetrock covered with vinyl wallpaper is almost impossible to dry. Perhaps, if the vinyl wallpaper is pulled away from the wall and dried out, then re-glued, this paper might be saved. However, if vinyl wallpaper remains wet for more than a couple days

it is more prudent and less expensive to remove and replace the sheetrock and wallpaper. We have experienced sheetrock covered with vinyl wallpaper that has remained wet more than two months after the initial water intrusion, and, yes, mold was definitely growing behind the wallpaper. Even the potential for mold exposure to the building occupants can lead to a myriad of problems.

Removing wet sheetrock (especially if it is covered with vinyl wallpaper) is always the best decision from a cost, public relations, and health perspective.

If you have any questions relating to this topic, you are welcome to call: Jim Kerns at 509-789-3517, or Eric Dickson at 509-789-3518.

Washington Health Districts Gain IAQ Experience

By Tim Hardin, Indoor Air Quality Manager, Washington State Department of Health

This winter, more Washington health districts are gearing up to assist schools with indoor air challenges. The State Department of Health and the U.S. Environmental Protection Agency sponsored a couple of two-day school indoor air quality workshops. These workshops were conducted in Vancouver, Wash., and Colfax, Wash., with 20 and 11 participants attending respectively. The health districts represented were from the counties of Thurston, Kitsap, Cowlitz, Clark, Chelan-Douglas, Spokane, Kittitas, Walla Walla, and Whitman. A number of school district personnel from these areas also attended and added their unique and valuable perspective to the information that was presented and shared.

The trainings are intended to bring the current grant folks (the local health people) up to speed on the Tools for Schools program and the current implementation process. We have it set up so that they all get a minimum equipment package (CO₂, RH, Temp, smoke pencil and a digital camera). The two-day training is intended to give them the basics of school IAQ including equipment demonstrations and an on-site field trip. An opportunity to schedule some IAQ walk-throughs in local schools is offered to participants – these walk-throughs will be guided by WSU Cooperative Extension staff, Tim Hardin of the Washington State Department of Health, or Eric Dickson of Educational School District 101. Upon completion of these on-site assessments, the participants will be able to assist schools in their districts with Tools for Schools walk-throughs and the implementation process.

The *School Indoor Air Quality Best Practices Manual* has been updated. For those of you interested in the new version, you can find it at www.doh.wa.gov/ehp/ts/iaq.htm. We have updated phone and contact information, and added new and updated web links. The code references have changed and we have added new sections on several topics as well as updates for other sections throughout the document.

Tech Tips

If you are investigating IAQ or comfort complaints, one of the best ways to understand what's happening in a classroom or other area in your school is to collect some basic data. Information about temperature, relative humidity, carbon dioxide concentrations or even carbon monoxide and other suspected contaminants can be measured to help determine the cause of problems.

Sometimes a few quick measurements will confirm that a room is too warm, relative humidity is too low, ventilation is inadequate, or there are unusually high levels of particulates, etc. Other times, however, a quick measurement may not find anything unusual. Conditions often change and problems may not become apparent without monitoring conditions over an extended period of time.

High end test equipment often has a data logging capability built in and it may be a feature to look for when purchasing equipment. There is also relatively inexpensive data logging equipment available that will help create a profile over time of conditions in a room.

Figure 1 shows the CO₂ concentrations in a classroom over a 24-hour period. The data was collected using a Telaire 7001 CO₂ monitor connected to a HOBO H8 data logger (seen in Figure 2). By collecting data for a whole day or a week or even longer, it's possible to develop a

profile of how the room responds to a wide range of different operating conditions and discover problems that may not be evident from a simple spot check.

For less than \$100, you can purchase a small battery operated data logger that will record temperature, relative humidity and additional external inputs from other sensors (like the Telaire 7001 CO₂ monitor). Similar inexpensive data loggers can record on/off cycling of equipment, carbon monoxide concentrations, as well as milli-amp and direct current voltage outputs from a variety of external sensors.

There are a number of manufacturers of data logging equipment. Information from Onset, the makers of HOBOS, can be found at www.onsetcomp.com,

a good place to start to find out more.

If you're not ready to invest in your own equipment, the Washington State University Extension Energy Program has a limited number of HOBO loggers, carbon dioxide sensors and carbon monoxide sensors available to loan to schools in Alaska, Idaho, Oregon and Washington as part of our technical support of the U.S. Environmental Protection Agency's Tools for Schools Program. Try before you buy.

Contact: David Hales, halesd@energy.wsu.edu, 509-477-6702; or Rich Prill, prillr@energy.wsu.edu, 509-477-6701.

Figure 1
Classroom CO₂

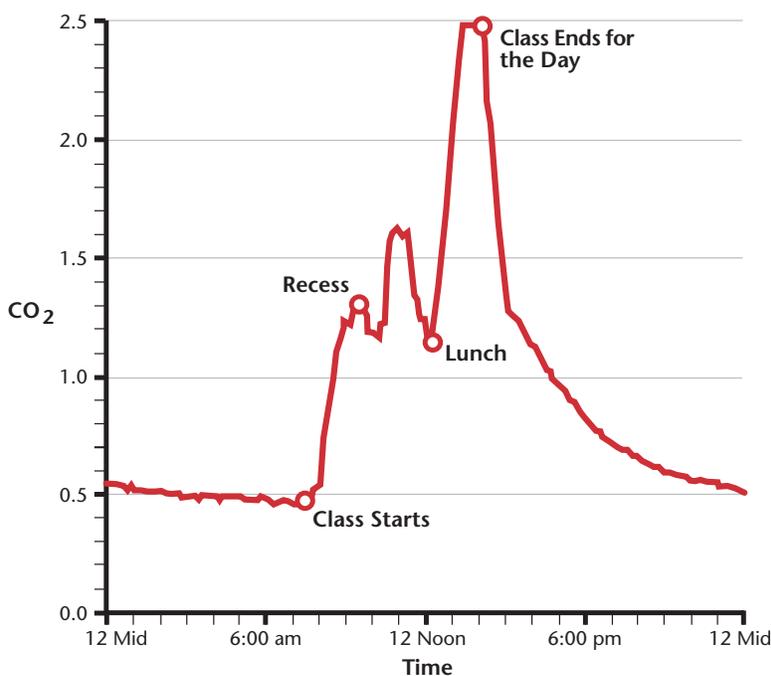


Figure 2