

Sustainable Chemical Management in Schools

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Who I Am....

- **Schools Program Coordinator for the Region 6 office of the Environmental Protection Agency**
- **Graduated from the University of Pittsburgh with a BS in Electrical Engineering**
- **Have been with the EPA since the fall of 2005**
- **Protecting kids is my #1 priority!**

Why Be Concerned About Chemical Management?

- **Health hazards: immediate & long-term**
- **Safety hazards: stability of shelves, storage methods and incompatibility**
- **Environmental harm: groundwater, discharges to streams/rivers, air pollution**
- **Hidden costs/liabilities: lawsuits, fines, paperwork/fees, insurance premiums, etc**

Why Be Concerned About Chemical Management?

As adults, we are responsible for ensuring the health and safety of all children in our care!



Why is EPA Involved in Children's Health?

Children may be more vulnerable to environmental exposures than adults because:

- **Their bodily systems are still developing**
- **They eat more, drink more, and breathe more in proportion to their body size**
- **Their behavior can expose them more to chemicals and organisms**
- **Also, children can't advocate for themselves. So adults have to be their voice.**

Region 6 Indoor Environments Program

Two areas of focus

Healthy Schools

- Indoor Air Quality
- **Chemical Management*****
- Integrated Pest Management

Healthy Homes

Our mission is to reduce human health risks posed by contaminants in indoor environments, with a particular focus on those with respiratory diseases such as asthma

Healthy School Environments

Indoor Air Quality Tools for Schools

- Resource to help schools maintain a healthy environment in school buildings by identifying, correcting, and preventing IAQ problems

Schools Chemical Cleanout Campaign***

- Aims to ensure that all schools are free from hazards associated with mismanaged chemicals

Integrated Pest Management in Schools

- Common sense strategies to reduce sources of food, water and shelter for pests in school buildings and grounds
- Takes advantage of all pest management strategies, including the judicious and careful use of pesticides when necessary

Schools can help improve the comfort and **performance** of students and faculty members by improving the indoor environment!

Where Are the Chemicals?

- Maintenance Areas
- Vocational Shops
- Science Laboratories
- Art Classrooms
- Storage Closets

In other words, they are found **throughout** the school.

Examples

Poor Management Practices

- Water reactives near/under sink
- Heavy containers on high shelves
- Corrosives on (corroded) metal shelves
- Flammables stored on wood
- Alphabetical storage (incompatible?)
- Unlabeled/"mystery" contents
- Chemicals next to food

Incompatible Chemical Storage



Excessively Hazardous (high flammability material)



Metal Shelving Deterioration



Bottles as structural support
for shelf above them
Need disposal but can't move them



Over Purchasing/Excess Chemicals



No Security: Easy Access to All



Inappropriate Storage



Nitric “Gnome”

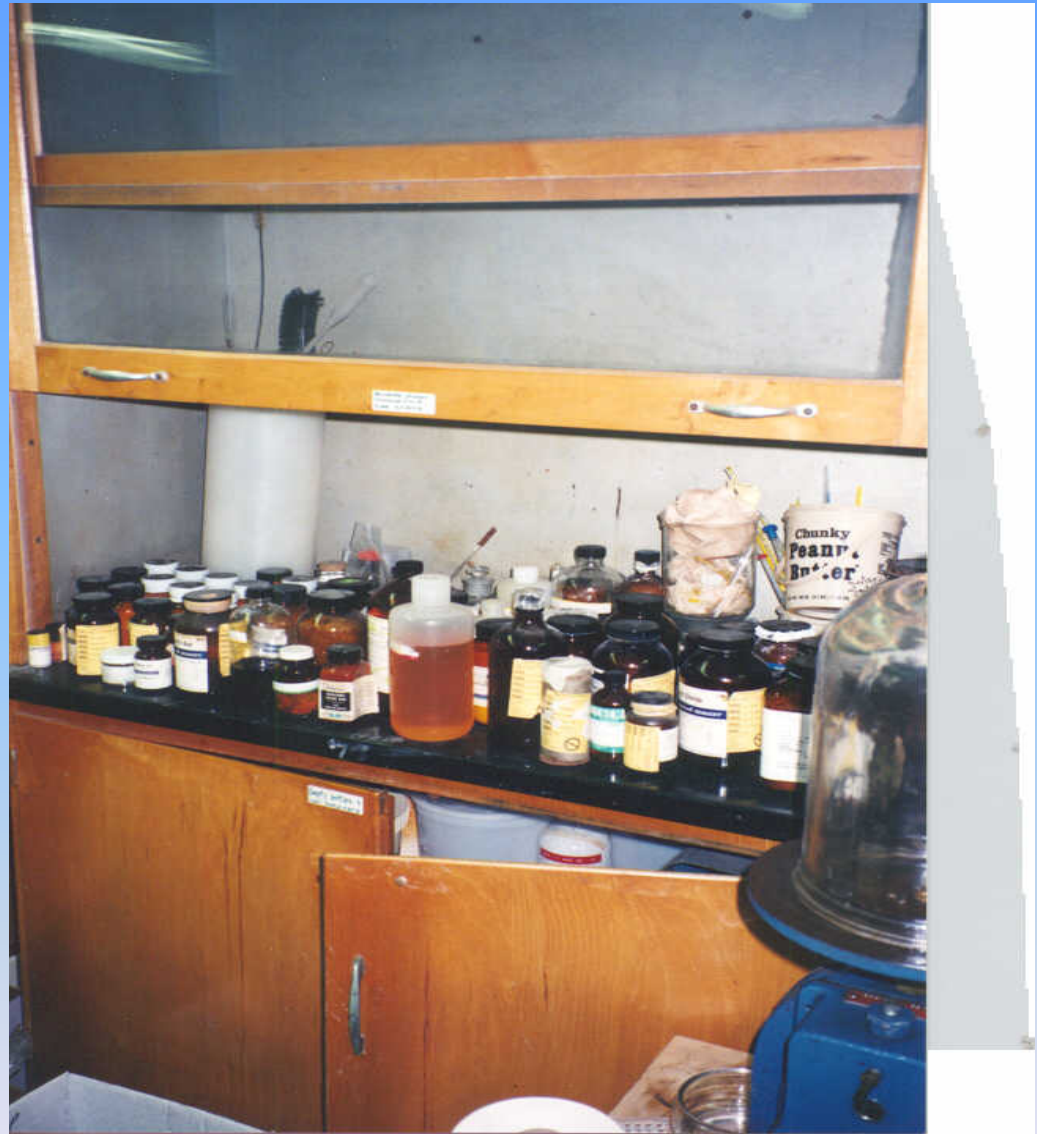


Unintended Chemical Reaction

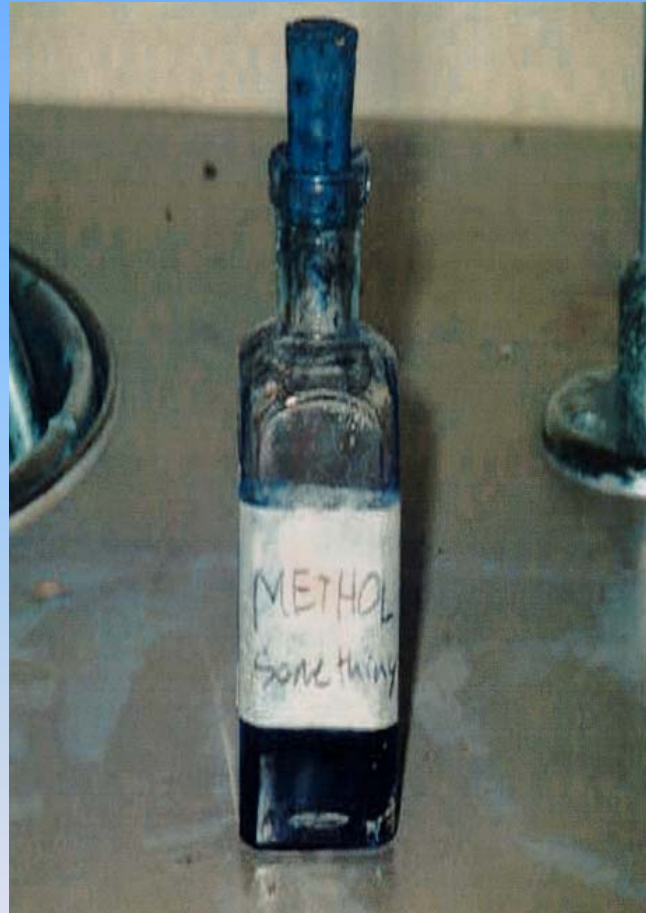


Imminent Risk Nitric Acid + Cyanide

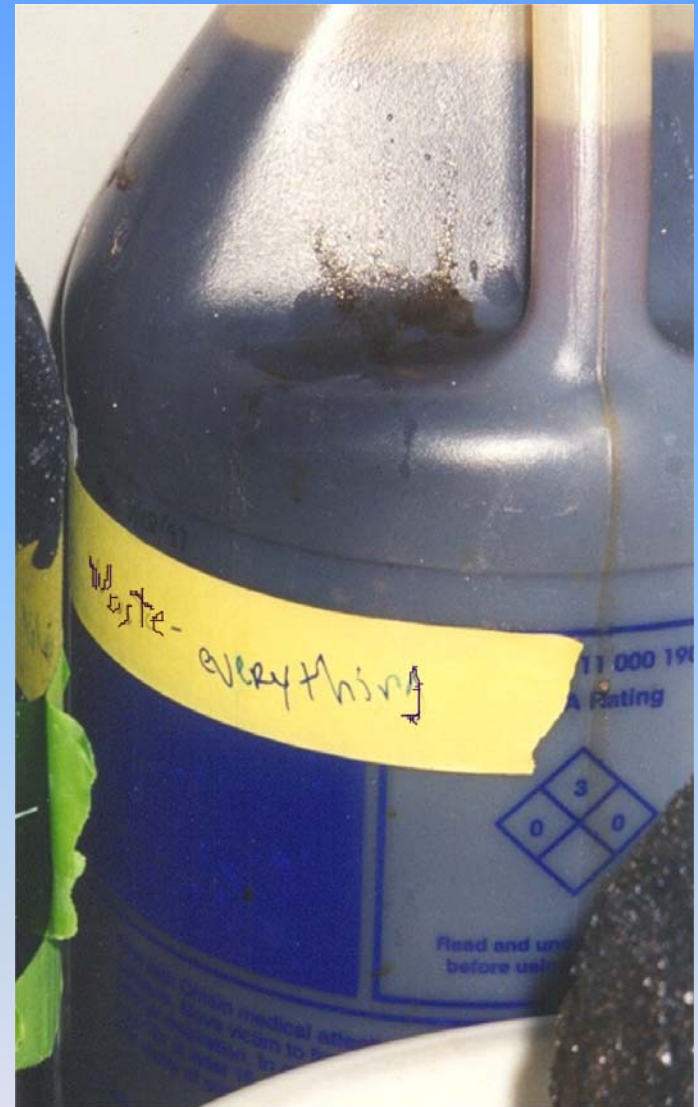
Dysfunctional Fume Hood



At least we know it's organic...



What IS it????



Why Do I Need to Plan for Chemical Management?

- **Chemical emergencies in schools are continually occurring across the nation. Children and staff are at risk.**
- **Cleaning up chemical spills more costly than removing the chemicals from schools and implementing preventive measures.**

Costs and Benefits of Such a Program

- **Cleaning up after an incident is costly:**
 - **Cleanup can cost over a million dollars, cause closure of schools, and relocation of students.**
- **Cleanout and prevention programs are good investments:**
 - **Cleanout costs average \$5,000 per school, but can be \$30,000 or more if radioactive or explosive chemicals are involved.**
 - **Prevention programs can eliminate potential incidents.**

Case Study

This case study illustrates how the clean up of one very minor mercury spill cost more than a planned cleanout of mercury at 81 sites.

Proactive

- In “Rehab the Lab” program, 81 sites had either bulk mercury liquid, mercury thermometers, or more both.
- Total cost for packaging, transport and disposal of the mercury for all **81 sites** was **\$24,300**.

Reactive

- Small amount of mercury spilled on a carpet.
- Costs
 - Bad publicity
 - Virtual paralysis of the facilities maintenance program for a couple weeks
 - Potential exposure
 - One site cost over \$30,000 for disposal

Schools Chemical Cleanout Campaign (SC3)

- **Remove** outdated, unknown, excessive, or unnecessarily hazardous chemicals from secondary schools;
- **Prevent** future stockpiles and reduce accidents by establishing prevention activities such as good purchasing and management practices;
- **Raise national awareness** of the problem.

What Can You Do?

Short Term Actions

- Learn about chemical hazards
- Learn about requirements at various levels
 - Federal (e.g. OSHA HazCom, Chem RTK)
 - State
 - Local (e.g. building or fire code)
 - District

Short Term Actions

- **Build awareness in**
 - Administration
 - Business Officials
 - Purchasing
 - Facilities / Maintenance

- **Elements to build awareness of**
 - Issue is important
 - It needs attention
 - It needs funding

Short Term Actions

- **Work with professionals to identify hazards**
- **Get rid of the Accumulations**
 - **Inventory (know what you have!)**
 - **Remove chemicals**
 - **Hazardous**
 - **Outdated**
 - **No longer needed**

Short Term Actions

- **For inventory remaining**
 - **Obtain and Maintain Material Safety Data Sheets**
 - **Keep 1 set in lab**
 - **Keep 1 set in office**

Longer Term Goals

- **Develop a chemical management system**
 - **Purchase**
 - **buy only what you need**
 - **Storage, including labeling**
 - **Use, including labeling**
 - **Disposal /Removal**
 - **budget for this item in advance**
 - **Emergency Planning – spills, explosions, accidents**

Longer Term Goals

- **Use chemicals in smaller quantities**
 - Order min quantities, consistent with use
 - Try to keep only 1 year's worth stock
- **Order “safer” alternatives**
 - Green chemistry
 - Microscale approaches (e.g. spot plates instead of test tubes)
- **Develop policies that specify what chemicals can enter the system and how they will be handled throughout their lifecycle.**

Longer Term Goals

- **Develop and maintain chemical hygiene plan for chemicals**
- **Regularly budget for removals (cradle to grave)**
- **Develop partnerships with others in your community.**

Schools and Community Partners Working Together

- **Chemical Suppliers**
 - Provide technical assistance
 - Provide chemical management services
- **Waste Handlers**
 - Offer cost-effective waste analysis and handling solutions
- **Fire, Police, Military and Emergency Response**
 - Learn about chemical risks in schools
 - Assist schools in developing emergency response plans
 - Establish effective communication
- **Colleges and Universities**
 - Help schools assess chemical cleanout, management and disposal issues
 - Offer courses and training in EHS for teachers and school district employees
- **Environment, Health, and Education Agencies (local, state, federal)**
 - Fund school chemical cleanout and prevention programs
 - Provide technical assistance to schools in conducting chemical inventories and cleanouts

In Summary

- Take action to prevent incidents before they happen.
- Know what to do if an incident occurs.
- Build a team to meet your goals (Session 3, Topic 2)
- A healthy school environment improves the learning environment.

Questions???

