PENNSYLVANIA DEPARTMENT OF ENVIRONMENTAL PROTECTION

School Chemical Cleanout Campaign (SC3)

Chemical Management Training
INTRODUCTION

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<th>TIME(S)</th>
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<td>8:30</td>
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INTRODUCTION
Incidents of HS Chemical Accidents
Hazard Recognition

IMPORTANCE OF CHEMICAL SAFETY
Commitment, Roles, and Responsibilities

CHEMICAL HYGIENE PLANS
- Outline and Development
- Written Plan and Updating
- Material Data Safety Sheets (SDS)
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<td>• Inventory and Purchasing Plan</td>
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<td>• Safety Equipment</td>
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<td>• Spill Control</td>
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<td>• Emergency Plans</td>
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<td>APPLICATION REVIEW OF SCHOOL CHEMICAL CLEANOUT PROGRAM</td>
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<td>REVIEW AND QUESTIONS</td>
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RECENT LAB INCIDENTS

They are occurring everyday of the week. What can be learned from them?

Some of us may have witnessed unsafe behavior or minor accidents, and yet, rather than viewing these incidents with concern and as opportunities to modify practices and behavior, we often have failed to act upon these “teachable moments.”

From Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards – Preface
Monday January 23, 2012

Science Experiment Ends in Evacuation of Dallastown Area High School
Tuesday, August 28, 2012

School Evacuated after 12 Students Injured in Science Lab Explosion at Moss Vale High School
Wednesday October 10, 2012

Albert Gallatin Teacher Hospitalized after ‘Chemical Spill’
Wednesday October 24, 2012

Derry High School Teacher Hurt when Chemistry Experiment Explodes
Thursday November 10, 2011

Chemical Spill Clears the Line
Mountain High School
Thursday, February 23, 2012

Fire Erupts in Hamburg High Chemistry Lab

Lab Experiment Sparks Tanana Middle School Evacuation
Friday December 9, 2011

Canby High School Evacuated After Chemistry Lab Fire
Each individual influences the “culture of safety” in the laboratory. All of us should recognize that the safety of each of us depends on teamwork and personal responsibility as well as the knowledge of chemistry.

From Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards – Preface
LABORATORY HAZARD RECOGNITION AND CLASSIFICATION

Since the age of alchemy, laboratory chemicals have demonstrated dramatic and dangerous properties. Some are insidious poisons.

From Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards – Chapter 1
Laboratory chemicals and operations are inherently hazardous. The hazards may be classified into two groups – Physical and Chemical.

**Physical Safety Hazards**

Include fire, explosion, skin cuts and abrasions, and extreme temperature.

**Examples**

- Compressed Gases
- Explosives
- Flammable
- Organic Peroxides
- Oxidizers
- Unstable Substances
- Water-reactive Substances
LABORATORY HAZARD RECOGNITION AND CLASSIFICATION

Chemical Health Hazards

Are substances that are hazardous to health when they enter the human body in sufficient quantity. The toxicity depends greatly on phase (e.g., gas, liquid, or solid) of substance, route of entry, duration of exposure and the quantity which is absorbed into the body. A substance can have acute or chronic health effects.
LABORATORY HAZARD RECOGNITION AND CLASSIFICATION

Examples

- Carcinogens
- Corrosives
- Highly Toxic Substances
- Irritants
- Sensitizers
There are four main routes by which chemical substances can enter the body:

- Inhalation (dusts, fumes, mists or vapors)
- Ingestion (eating or drinking with contaminated hands or in a contaminated laboratory)
- Absorption (contact with liquid, dusts, fumes, mists or vapors)
- Injection (accidental puncture of the skin with contaminated glass or metal)
• **Acids**: Acetic, hydrochloric, nitric, and sulfuric acids are corrosive to skin and mucous membranes.

• **Alcohols**: Methanol induces blindness via ingestion or prolonged inhalation. Ethyl alcohol depresses central nervous system by ingestion or prolonged inhalation.

• **Aldehydes and ketones**: Acetaldehyde (ethanal) and acetone are irritants and have narcotic effects via inhalation, absorption, or ingestion.

• **Aliphatics**: Acetylene, methane, and ethane are central nervous system (CNS) depressants, asphyxiants, neurotoxins.
LABORATORY HAZARD RECOGNITION AND CLASSIFICATION

- **Alkalies**: Sodium, potassium and ammonium hydroxide can cause severe tissue burns and bronchial spasms.

- **Asphyxiants**: Reduces the oxygen carrying capacity of the blood (e.g., CO) or displaces atmospheric oxygen (e.g. CO$_2$).

- **Compounds of sulfur, phosphorus, nitrogen**: SO$_2$, H$_2$SO$_4$(aq), H$_3$PO$_4$(aq), and nitrogen oxides are corrosive to the skin and destructive to respiratory tissues.

- **Halogens**: Chlorine, bromine and iodine are corrosive and highly irritating to tissues.

- **Metal fumes/vapors**: Metal fumes and vapors can cause systemic poisoning via ingestion and inhalation. Toxic effects may be compounded with prolonged exposure.
The ability to accurately identify and assess hazards in the laboratory is not a skill that comes naturally; it must be taught and encouraged through training and ongoing organizational support.

From Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards - Chapter 1
A crucial component of chemical education at every level is to nurture basic attitudes and habits of prudent behavior so that safety is a valued and inseparable part of all laboratory activities.

From Prudent Practices in the Laboratory: Handling and Management of Chemical Hazards – Chapter 1
IMPORTANCE OF SAFETY

Da Rulz by Anthony Lowe, Guilford College
IMPORTANCE OF SAFETY

• It is essential for all involved in the science instruction program to develop a positive approach to a safe and healthy environment in the school.

• Safety and health should be an integral part of the planning, preparation, and implementation of any science program.

• Safety and the enforcement of safety regulations and laws in schools, classrooms, and laboratories are the responsibility of the principal, teacher, and student, each assuming his/her role and share of the program.
IMPORTANCE OF SAFETY

The Principal’s Role and Responsibilities

• Recognize the need for establishing safety and health instruction as a fundamental part of the science curriculum.
• Initiate development of a laboratory safety program and provide the support necessary for implementation.
• Hold the teachers accountable for operating their classrooms and labs in a safe manner.
• Ensure school wide compliance with applicable federal, state and local regulations with regard to safety such as the Occupational Safety and Health Act of 1970.
IMPORTANCE OF SAFETY

The Teacher’s Role and Responsibilities

- Provide a safe and healthful learning environment for the students through implementation of the school’s safety plan.
- Instruct the students in the basic safety practices required in the school laboratories.
- Impress the need for caution and preparation before working with chemicals in school laboratories.
- Instruct the students regarding the hazards that are associated with the chemicals being used.
- Provide safety information and training to the students for each stage of the experiment.
IMPORTANCE OF SAFETY

The Student’s Role and Responsibilities

• Respect the principal, teachers, and operations staff in their efforts to provide a safe and healthful learning environment.
• Learn the basic safety practices required in the school laboratories.
• Follow teacher instruction and exercise the proper caution when working with chemicals in school laboratories.
• Heed the hazard warnings associated with any chemicals being utilized.
• Pay close attention to the safety information and training provided for each stage of the experiment.
The Written Plan for Chemical Management

Chemical Management Strategy Pyramid from DoD policy manual
The Written Plan is also called a CHEMICAL HYGIENE PLAN (CHP)

Definition:

A Chemical Hygiene Plan (CHP) is a written program stating the policies, procedures, and responsibilities that serve to protect employees, students, visitors, and others from the health hazards associated with the hazardous chemicals used in that particular work place.
CHEMICAL HYGIENE PLAN

Required Elements for a CHP

1. **Standard Operating Procedure (SOPs)**
   SOPs should be written, detailed activities that are relevant to the safety and health considerations of each activity as they involve the use of hazardous chemicals.

2. **Control Measures**
   A method or criteria to determine and implement control measures to reduce exposure to hazardous materials. The selection of control measures may include engineering controls, the use of personal protective equipment, administrative controls, and hygiene practices.
CHEMICAL HYGIENE PLAN

3. Safety Equipment
   A detailed plan, checklist, or inspection process to ensure laboratory chemical hoods and other protective equipment are installed and functioning properly.

4. Chemical Hazard Information
   Information for persons working with hazardous substances specifying the hazards of the chemicals in the work area, the location of the CHP, signs and symptoms associated with hazardous chemical exposures, the permissible or recommended exposure limits of the chemicals, and the location and availability of information on the hazards, safe handling, storage, and disposal of hazardous chemicals (not limited to Safety Data Sheets [SDSs]).
5. **Training**
   SOPs should be written, detailed activities that are relevant to the safety and health considerations of each activity as they involve the use of hazardous chemicals.

6. **Mechanism for Approval of Laboratory Procedures**
   The circumstances under which a particular laboratory operation or procedure requires prior approval from the appropriate administrator.
7. **Requirements of Medical Situations**
   The plan shall detail requirements for medical consultation and medical examinations. At a minimum, medical reviews shall occur whenever (1) a person develops signs or symptoms associated with a hazardous chemical, (2) exposure monitoring reveals an exposure level routinely above the action level, and/or (3) an event takes place in the work area, such as a spill, leak, explosion, or any other occurrence resulting in the likelihood of a hazardous exposure.

8. **Responsible Parties**
   The plan shall designate the personnel responsible for the implementation of the CHP, including the assignment of a Chemical Hygiene Officer or Chemical Coordinator.
9. **Special Requirements**
   Special requirements shall be included for additional protection when working with particularly hazardous substances, including “select carcinogens,” reproductive toxins, and substances with a high degree of acute toxicity.

10. **Evaluation of Plan**
    The plan must have provisions for a yearly re-evaluation.
CHEMICAL HYGIENE PLAN

CHP Action Plan - The First Three Steps

1. Appoint a Chemical Coordinator

The Chemical Coordinator is responsible for:

a. Developing and/or Approving SOPs
b. Reviewing and ordering safety supplies
c. Coordinating the inventory of chemicals
d. Reviewing and Approving Chemical Orders
e. Establishing and Enforcing Disposal Procedures
2. Institute an Inventory/Tracking System

- Need to start with an inventory to identify all chemicals that are present in the school.

- This detailed study will enable the chemical coordinator to evaluate the chemicals and determine which are excess or unsafe, and need to be removed from the school.

- Also, having a complete chemical inventory will also enable the chemical coordinator to avoid purchasing chemicals that are already present in the school.
CHEMICAL HYGIENE PLAN - CHP Action Plan

- Allow sufficient time to complete the inventory, and investigate all potential chemical storage areas.

- Conducted the inventory by using a team of two or more people. One person read out the name and quantity of each chemical, while the other person records the information on the inventory form.

- Use a detailed inventory form to document the chemicals.
• Collect adequate information on each chemical. The minimum information collected should include location, chemical name, container size, number of containers, condition of the containers, use of material, and other information from the label, such as purchase date or expiration date.

• Establish a tracking system, such as a paper card system or an electronic database of chemicals in the school.
CHEMICAL HYGIENE PLAN - CHP Action Plan

3. Control of Purchase

• Establish centralized purchasing program with the Chemical Coordinator handling all of the purchasing requests and linking the purchases to the inventory tracking system so that excess chemicals in stock can be used before buying more.

• Establish training for receiving personnel to ensure proper methods of receiving and handling of hazardous substances are used.
CHEMICAL HYGIENE PLAN - CHP Action Plan

• Always purchase the least hazardous chemical that will do the job. Use “Green Chemicals” and low volatile organic compound (VOC) cleaners and paints. Both are preferable from both a hazardous material management and an indoor air quality (IAQ) standpoint.

• Do not accept samples or donated chemicals or products, unless they are needed for a specific purpose or project.
CHEMICAL HYGIENE PLAN - CHP Action Plan

• Request a SDS for each chemical or product purchased from your manufacturer or shipper. These documents need to be readily accessible to both personnel who use the products and to emergency responders. A copy of all SDSs should be kept in the chemical coordinator’s office. A SDS for each chemical in a given storage area should be kept near, but not inside, that storage area.

• Your goal should be to try to minimize the total quantity of each hazardous material in storage to just what will be actually needed before the next order.
CHEMICAL HYGIENE PLAN - CHP Action Plan

- Establish a control system and enforce it. Perhaps try when a chemical or product is received, mark the date on the package or case. When an individual container is opened, mark this date on it, along with the expiration date, for products that have a limited shelf life after opening.
High Risk Chemicals

Some chemicals have such a high risk associated with them because of their hazardous characteristics that they should not be used in schools for any purpose.

Teachers who want to use any of these chemicals for a unique science experiment should either purchase the smallest amount possible, or a dilute solution. It is preferable to present a similar experiment that does not require the use of a high risk chemical. Students should not be permitted to handle or perform experiments using any of the following high risk chemicals.
Examples of High Risk Chemicals

1) Mercury
2) Peroxidizable Solvents and Metals
3) Oxidizers
4) Highly Reactive Chemicals
5) Highly Toxic Chemicals
6) Chemicals Regulated by the DEA
7) Radioactive Materials
8) Formaldehyde
CHEMICAL HYGIENE PLAN

• Safety Data Sheets (SDS)

✓ The OSHA Hazard Communication Standard (HCS) requires chemical manufacturers, distributors, or importers to provide Safety Data Sheets (SDSs) (formerly Material Safety Data Sheets or MSDSs) to communicate the hazards associated with chemical products.

✓ As of June 1, 2015, the HCS will require new SDSs to be in a uniform format with specific section numbers, headings, and associated information under the headings.

✓ Employers must ensure that SDSs are readily accessible to employees. Appendix D of 29 CFR 1910.1200 provides a detailed description of SDS content.
CHEMICAL HYGIENE PLAN

SDS Section Headings

Section 1  Identification
Section 2  Hazard(s) identification
Section 3  Composition/information on ingredients
Section 4  First-aid measures
Section 5  Fire-fighting measures
Section 6  Accidental release measures
Section 7  Handling and storage
Section 8  Exposure controls/personal protection
CHEMICAL HYGIENE PLAN

SDS Section Headings continued

Section 9  Physical and chemical properties
Section 10 Stability and reactivity
Section 11 Toxicological information
Section 12 Ecological information
Section 13 Disposal considerations
Section 14 Transport information
Section 15 Regulatory information
Section 16 Other information
LABELING
CHEMICAL HYGIENE PLAN

Labeling

- Labeling Basics

  ✓ Use labels with good adhesive.

  ✓ Use a permanent marker (waterproof and fade resistant) or laser (not inkjet) printer.

  ✓ Print clearly and visibly.

  ✓ Replace damaged, faded or semi-attached labels.
CHEMICAL HYGIENE PLAN

• Labeling Chemicals

  ▪ Commercially Packaged Chemicals

  Upon delivery – verify that the label contains the following information:
  ✓ Chemical name (as it appears on the SDS)
  ✓ Name of chemical manufacturer
  ✓ Necessary handling and hazard information

  We suggest that you add:
  ✓ Date received
  ✓ Date first opened
  ✓ Expiration or “use by” date (if one is not present)
Secondary Containers and Prepared Solutions

Upon transferring a material from the original manufacturer’s container to other bottles or containers, these are referred to as “secondary containers.”

Secondary Containers and Prepared Solutions

Label all containers used for storage with the following:

- Chemical name (as it appears on the SDS)
- Name of the chemical manufacturer or person who prepared the solution
- Necessary handling and hazard information
- Concentration or purity
- Date prepared
- Expiration or “use by” date
CHEMICAL HYGIENE PLAN

- Containers in Immediate Use

All chemicals are to be used within a given day or classroom session should be labeled clearly.

Label all containers in immediate use with the following:

- Chemical name (as it appears on the SDS)
- Necessary handling and hazard information
CHEMICAL HYGIENE PLAN

• Labeling of Chemical Waste

All containers (large or small) used for chemical waste should be labeled as follows:
✓ WASTE” or “HAZARDOUS WASTE”
✓ Chemical name (as it appears on the SDS)
✓ Accumulation start date
✓ Hazard(s) associated with the chemical waste

• Labeling Peroxide-Forming Substances

Peroxide-forming chemicals must be labeled as follows:
✓ Date received
✓ Date first opened
✓ Date to be disposed of
CHEMICAL STORAGE
CHEMICAL HYGIENE PLAN

Chemical Storage

As you know, a variety of different chemicals with different hazards may be present in different departments in a given school. Improper storage of these chemicals may lead to an increased risk of reaction in the event of container failure or spillage. Proper storage of chemicals will help to reduce this risk.

• Do not store chemicals randomly or in alphabetical order. This increases the risk of incompatible chemicals coming into contact, especially in the event of a fire or other emergency event.
CHEMICAL HYGIENE PLAN

• Do not store chemicals in a laboratory hood, on bench tops or under sinks. They interfere with the airflow in the hood, are more easily knocked over and could potentially spill into a drain.

• Do not store flammable chemicals in a regular refrigerator. This could result in an explosion and fire. If flammables must be refrigerated, store them in a designated explosion-proof or flammable material refrigerator. Do not store food in a designated chemical refrigerator.
CHEMICAL HYGIENE PLAN

• Flammable and volatile chemicals should always be stored tightly capped to keep their vapors from interacting and to reduce the potential for human exposure.

• Always store flammable materials in a flammable storage cabinet, well away from oxidizers.

• Do not store combustible materials inside or on top of flammable material storage cabinets.
CHEMICAL HYGIENE PLAN

- Store corrosive materials in corrosion-resistant containers and cabinets.
- Store acids and bases separately.
- Store oxidizing acids, such as nitric acid and perchloric acid separate from other acids.
- Liquids, corrosive chemicals, and glass containers should not be stored on shelve above eye level. It is preferred that no chemicals be stored above eye level.
CHEMICAL HYGIENE PLAN

- Store heavier containers at a level that is consistent with its size and anticipated use. For example, five-gallon buckets with handles could be stored on a pallet on the floor, while smaller heavy products should be stored on a shelf at waist height to minimize bending and twisting while lifting, which could lead to back or shoulder strain.

- Secondary containers or totes should be used to minimize the flow of material in the event of a spill or container leak. The materials should be segregated by hazard category.
CHEMICAL HYGIENE PLAN

• Laboratory Chemical Segregation

  – There are a variety of laboratory chemical segregation plans available for use. Some of which are very specialized. They can be based on hazard class or chemical incompatibility.

  – Other plans are derivations from that outlined in the National Research Council’s Prudent Practices in the Laboratory: Handling and Disposal of Chemicals.

  – Many universities publish diagrams of recommended chemical storage systems on their websites.
CHEMICAL HYGIENE PLAN

- Chemical supply companies also often have recommended plans for chemical storage in their catalogs or other distributed reference manuals.

- Many of these systems are based on a series of codes for functional classes of chemicals.
Suggested Shelf Storage Pattern

A suggested arrangement of compatible chemical families on shelves in a chemical storage room, suggested by the Flinn Chemical Catalog/Reference Manual, is depicted on the following page. However, the list of chemicals below does not mean that these chemicals should be used in a high school laboratory:

- First sort chemicals into organic and inorganic classes.
- Next, separate into the following compatible families.

<table>
<thead>
<tr>
<th>Inorganics</th>
<th>Organics</th>
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<tbody>
<tr>
<td>1. Metals, Hydrides</td>
<td>1. Acids, Anhydrides, Peroxides</td>
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<tr>
<td>fides, Sulfides, Thiosulfates</td>
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<tr>
<td>3. Amides, Amines, Nitrates (except</td>
<td>3. Aldehydes, Esters, Hydrocarbons</td>
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<tr>
<td>Ammonium nitrate), Nitrates, Nitric</td>
<td></td>
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<tr>
<td>acid</td>
<td></td>
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<tr>
<td>5. Cerbides, Nitriles, Phosphides, Selenides, Sulphides</td>
<td>5. Epoxy compounds, Isocyanates</td>
</tr>
<tr>
<td>9. Acids (except Nitric acid)</td>
<td></td>
</tr>
<tr>
<td>10. Arsenic, Phosphorus, Phosphorus</td>
<td></td>
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<tr>
<td>Pentoxide, Sulfur</td>
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</table>

*Chemicals deserve special attention because of their potential instability.
Gas Cylinder Storage and Handling Basics

The safe handling of compressed gas cylinders is critically important because compressed gas cylinders present two hazards. The hazards are as follows:

- Potentially toxic, corrosive, or flammable chemical hazard associated with the gas itself
- Physical hazard of the high pressure gas cylinder

An example of an extreme hazard may occur would be if the cylinder valve gets sheared off in an accidental fall, the cylinder literally would become a rocket that can smash through a cinder block wall.
CHEMICAL HYGIENE PLAN

• Planning

  – Purchase cylinders from companies that will accept the cylinder back. Even nonhazardous compressed gas cylinders can be costly to dispose. Purchase only the size and quantity of cylinders that you need.

  – Most high school laboratories are not adequately equipped to safely handle toxic gas cylinders.

  – If considering the use of a toxic gas cylinder for a demonstration, seriously evaluate whether you really need and can safely store and use the product.
CHEMICAL HYGIENE PLAN

– Do not rely on color coding to identify the contents of a compressed gas cylinder. There is no universal standard. Different manufacturers use different color codes. Always check the label.

– Do not use cylinders with missing or illegible labels.

• Safe Storage

– When the cylinder is not in use, the valve protection cap must be in place to protect the valve.

– Never drag, slide or roll the cylinder – get a cylinder cart or truck and use it. The cylinder must be secured to the cart during transport.
CHEMICAL HYGIENE PLAN

– Never transport the cylinder with the regulator in place – have the valve protection cap on.

– Cylinders must be secured at all times to a wall, lab bench, cylinder storage rack, or welding cart. Use an appropriate material to secure the cylinder: chain, wire rope, straps, etc. The support should contact the cylinder at a point approximately 2/3 of its height.

– Don’t store gas cylinders in public hallways or other unprotected areas. Gas cylinder storage should also be segregated by hazard class. Flammable gas should be stored either at least 20 feet from oxygen and oxidizers, or separated by a one-hour fire-rated wall.
CHEMICAL HYGIENE PLAN

- When a cylinder is empty, mark “Empty” or “MT” on the cylinder or tag, or tear off the last strip if it has a perforated status tag. Empty cylinders must still be segregated and properly supported.

- Safe Use

  - Check the cylinder for damage before use.
  
  - Make sure the cylinder has the correct regulator.
  
  - Do not use grease or oil on the regulator or cylinder valve, especially with oxygen – an explosion may result.
CHEMICAL HYGIENE PLAN

– Only open the cylinder valve with a regulator in place. Open the valve all the way – do not leave the valve part way open. When the cylinder is not in use, close the valve, even if it is empty – air and moisture may enter through the open valve, causing contamination and corrosion.

– Tanks of acetylene should only be used in the upright, valve on top position. The acetylene gas is dissolved in liquid acetone inside the tank. Do not use copper or bronze fittings or tubing on acetylene tanks as this may cause an explosion. All oxygen/acetylene setups must have a flashback arrestor check valve at the regulators.
CHEMICAL HYGIENE PLAN

- Do not heat a cylinder to raise the pressure of the gas. The cylinder has a temperature sensitive safety device to prevent overpressure, and heating the cylinder could cause it to activate, releasing the gas. Similarly, do not allow the cylinder to be near sparks or open flames, or to come into contact with electric wires.
CONTROL MEASURES
7. Control Measures

Personal protective equipment (PPE) is often used when the risk of contact with a hazardous material cannot be otherwise controlled. It is a barrier between the material and the chemical user, either by physically preventing contact, or by filtering the chemical from the atmosphere.

PPE is therefore the last line of defense before the chemical contacts the user. As such, it should not be the primary means of controlling the exposure risk.
Primary Controls

As mentioned, Elimination, Substitution and Reduction are the preferred methods of reducing the risks of exposure to chemical agents. After exhausting those routes, administrative controls and ventilation strategies should be explored before resorting to PPE.

Administrative Controls

– Administrative controls involve controlling who accesses the hazardous chemicals, how often, and how much of each chemical is present.
CHEMICAL HYGIENE PLAN - CHP Action Plan

– Access to chemical storerooms should be limited, and the rooms and storage cabinets should be kept locked.

– Only experienced personnel, who are familiar with the hazards and appropriate exposure controls, should be permitted to handle the chemicals.

– The chemical coordinator can also control the exposure risk by limiting the quantities of hazardous chemicals purchased and in storage at any one time.
VENTILATION

Exposure to airborne hazardous chemicals can also be controlled through the use of ventilation. Two types of ventilation are commonly used: dilution ventilation and local exhaust ventilation.

Dilution ventilation usually involves opening a window or setting up a fan to allow fresh air to come into the room. Dilution ventilation is typically appropriate when using a cleaner or paint on large surfaces, where the material is not especially hazardous. It would not be appropriate for performing laboratory experiments with volatile chemicals. Dilution ventilation is also used to control the build-up of airborne chemical contaminants in storage areas.
– Local exhaust ventilation is a control that mechanically extracts the airborne dusts, mists, fumes or vapors from the point of generation and removes them from the building. The most common example in a school would be a laboratory-style hood, but other applications, such as welding hoods in metal shop, may also be present. Laboratory fume hoods should not be used for chemical storage. You should always store chemicals in the appropriate flammable cabinet, acid cabinet, or chemical stock room.
CHEMICAL HYGIENE PLAN - CHP Action Plan

• The Role of PPE

Even after minimizing the use of hazardous materials, PPE may still be required to reduce the exposure risks to an acceptable level. Anyone at risk of coming into contact with a hazardous material, including accidental contact and spills, should wear appropriate PPE to prevent or minimize exposure.
CHEMICAL HYGIENE PLAN - CHP Action Plan

• Selecting Appropriate PPE

The selection of appropriate PPE requires that you recognize and evaluate each hazard, identify the potential routes of exposure, determine the required performance characteristics of the protective equipment, evaluate the cost of the various options, and then make the selection of appropriate PPE.

– Eye and Face Protection
– Hand and Arm Protection
– Body Protection
– Respiratory Protection
8. Spills

The best way to prevent and manage spills is through prevention and preparation.

• Spill Prevention

As a teacher or administrator, you can help prevent spills in your area through:

*Administrative Controls*

– Spend time educating students about potential spills and how they will be managed in your specific area or classroom.
CHEMICAL HYGIENE PLAN - CHP Action Plan

– Avoid purchasing chemicals in bulk sizes, glass containers, and in excess. All can increase the probability of spills.

– Routinely conduct an inspection of chemical containers and storage locations to identify potential leaks, degraded container conditions, or other deficiencies that can lead to leaks or spills.

– Prevent negligent student behavior including inattentiveness, carelessness, or general horseplay in work areas.
Cleanliness & Physical Controls

- Maintain housekeeping in all areas and avoid clutter.
- Keep containers closed, except when adding or removing contents.
- Ensure chemicals are properly stored in appropriately sized containment during long term storage and during transport between areas or classrooms.
CHEMICAL HYGIENE PLAN - CHP Action Plan

- Preparation for Spills

  Be prepared, equipped, and trained to manage a spill.

  - Safety First.

  - Inform the students of the hazards of the chemicals stored and used in a particular work area or classroom. Ensure that they understand how to protect both themselves and their peers during regular use and during a spill.
CHEMICAL HYGIENE PLAN - CHP Action Plan

- Inform the school nurse of all chemical types stored in your school and make sure they are prepared to treat any injury that results from a spill or injuries. These include broken glass cuts, chemical burns, or extreme temperature exposures (e.g. boiling water or liquid nitrogen exposure).

- Ensure that appropriate PPE is available for everyone handling chemicals. Make sure there is an abundant supply, and that everyone is properly trained on how to safely use it.
CHEMICAL HYGIENE PLAN - CHP Action Plan

9. Contingency Planning

Prepare an Action Plan

• Conduct a Practice Drill

  – Follow action plan
  – Assess the spill
  – Call help if needed
  – Remove injured or unneeded personnel from the spill area and perform appropriate medical attention for those affected
  – Follow decontamination directions found on the product’s MSDS
CHEMICAL HYGIENE PLAN - CHP Action Plan

- Access the spill kit, and wear the appropriate PPE.
- Clean the Spill
- Discard spent/ruined PPE in the same hazardous waste container
- Evaluate the Clean-up Effort

- Emergency Spill Clean-Up Contacts List
  - Call the spill clean-up contractors if you are unable to contain the spill.
  - For spills of materials classified as “hazardous materials,” 911 should be immediately notified.
CHEMICAL HYGIENE PLAN - CHP Action Plan

• Clean-up Materials

  – Spill Kits can vary in size (5-gallon buckets, to 55-gallon drums, to mobile carts). However, they should all include basic response materials:

  - Absorbents
  - Clean-up Tools
  - PPE

  – Ensure that spill kit storage locations are all of the following:

  - Accessible
  - Convenient
  - Properly stocked
  - Properly sized
CHEMICAL HYGIENE PLAN - CHP Action Plan

- Mercury Spills

Mercury is a heavy metal with very unique chemical and physical properties that can exist as a liquid, vapor, or within a compound (e.g. methyl mercury). Exposure to mercury can negatively affect breathing (vapors) and cause corrosive skin burns, birth defects, and central nervous system damage.

Spills exceeding 1 gram of mercury (the amount contained in a thermometer) should be cleaned by a professional environmental clean-up contractor that has the monitoring equipment to screen for mercury vapors. Call Poison Control or 911 if someone has inhaled mercury vapors.
CHEMICAL HYGIENE PLAN - CHP Action Plan

• Aquatic Program Chlorine Management

Depending on the size of your school, your facility may have an indoor swimming pool. Some common chemicals associated school pools include: sodium hypochlorite (bleach), calcium hypochlorite, chlorine, hydrochloric acid, and algae control agents. Each chemical has hazards associated with their handling, use, and storage.

– Safe Storage.

– Chlorine gas is highly toxic and corrosive. It should never be used in an unvented, enclosed environment.
CHEMICAL HYGIENE PLAN - CHP Action Plan

– Application should only be performed by trained pool service personnel who are familiar with the appropriate safety precautions.

– Keep emergency contact information posted near the pool chemical storage location.

• Insecticides, Pesticides, and Herbicides

– Insecticides, pesticides, and herbicides may be applied by maintenance personnel or independent contractors in order to control unwanted pests on school property.
Under no circumstances should administration personnel, teachers, faculty, or students apply, use, or handle any liquid, solid, or gaseous pest control agents. Remember that application of these agents require proper training, safety precautions, and regularly updated certifications.

Consult your school’s pesticide application policy for further details.
REDUCTION OF STORED CHEMICALS
CHEMICAL HYGIENE PLAN - CHP Action Plan

10. Reduction of Stored Chemicals or Waste

All laboratories that use chemicals inevitably produce chemical waste that must be properly removed or disposed of at an appropriate facility. It is crucial to minimize both the toxicity and the amount of chemical waste that is generated.

A waste management and reduction policy that conforms to state and local regulations should be established by the school or school district.
Several things that can be done to minimize hazards, waste generation, and control costs:

- Purchase chemicals in the smallest quantity needed.
- Use safer chemical substitutes/alternatives such as chemicals which have been determined to be less harmful or toxic.
- Use microscale experiments.
- Chemical experiments using smaller quantities of chemicals
- Consider detoxification or waste neutralization steps.
CHEMICAL HYGIENE PLAN - CHP Action Plan

• Use interactive teaching software and demonstration videos in lieu of experiments that generate large amounts of chemical waste.

• Use preweighed or premeasured chemical packets (no excess chemicals remain).

For information about the EPA’s Green Chemistry Program, which promotes the use of innovative technologies to reduce or eliminate the use or generation of hazardous substances, visit:

www.epa.gov/greenchemistry/
www.chemistry.org/portal/a/c/s/1/acsdisplay.html?DOC=greenchemistryinstitute/index.html
### CHEMICAL HYGIENE PLAN - CHP Action Plan

**Table 1. Possible substitutions**

<table>
<thead>
<tr>
<th>Toxic chemicals/equipment</th>
<th>Possible substitution(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mercury thermometers</td>
<td>Digital and alcohol thermometers</td>
</tr>
<tr>
<td>Mercury barometer</td>
<td>Aneroid or digital pressure sensors</td>
</tr>
<tr>
<td>Methyl orange or methyl red</td>
<td>Bromophenol blue, bromothymol blue</td>
</tr>
<tr>
<td>Lead chromate</td>
<td>Copper carbonate</td>
</tr>
<tr>
<td>p-Dichlorobenzene</td>
<td>Lauric acid</td>
</tr>
<tr>
<td>Dichromate/sulfuric acid mixture</td>
<td>Ordinary detergents, enzymatic cleaners</td>
</tr>
<tr>
<td>Alcoholic potassium hydroxide</td>
<td>Ordinary detergents, enzymatic cleaners</td>
</tr>
</tbody>
</table>
11. CHEMICAL DISPOSAL

REMINDER - Any chemical discarded or intended to be discarded is a “chemical waste.”

Defining Hazardous Waste

Hazardous chemical waste as designated by the Environmental Protection Agency (EPA) or State authority is waste that presents a danger to human health and/or the environment.

The law regulates various chemicals and their activities from “cradle to grave” - from the point they are generated as hazardous waste until they are properly destroyed, incinerated, or landfilled.
CHEMICAL HYGIENE PLAN - CHP Action Plan

To be a *hazardous* waste, the waste must first be classified as a *solid* waste.

- A solid waste is defined as any *solid*, *liquid*, or contained *gaseous* material that is being disposed, discarded, incinerated, recycled, or is inherently waste-like.

- Once a solid waste has been identified, the next step is to determine if it is a hazardous waste, which can be accomplished by deeming the waste as a “characteristic waste” or a “listed waste.”
CHEMICAL HYGIENE PLAN - CHP Action Plan

According to EPA regulations, there are four characteristics that define a waste as hazardous:

- Ignitability
- Corrosivity
- Reactivity
- Toxicity

If you require further assistance in determining your hazardous waste status, contact your local PADEP Office and request the Waste Management Section.

http://www.portal.state.pa.us/portal/server.pt/community/about_dep/13464/office_locations/585263
Storing Chemical Waste

- Store all waste in containers that are in good condition and are compatible with their contents.
- Clearly and permanently label each container as to its contents and label as hazardous waste (refer section titled How Should Chemical Containers Be Labeled? for specific information).
- Store waste in a designated area away from normal laboratory operations and to prevent unauthorized access.
CHEMICAL HYGIENE PLAN - CHP Action Plan

- Store waste bottles away from sinks and floor drains.
- Do not completely fill waste bottles; leave several inches of space at the top of each waste container.
- Cap all waste bottles and/or containers.
CHEMICAL HYGIENE PLAN - CHP Action Plan

Disposal Warnings

• HAZARDOUS WASTES SHOULD NEVER BE DUMPED IN ANY DRAINS, SEPTIC TANKS, OR STORM SEWERS.

• DO NOT MIX HAZARDOUS WASTES TOGETHER.

• DO NOT MIX NONHAZARDOUS WASTE WITH HAZARDOUS WASTE - in doing so you only create more hazardous waste, which creates higher disposal costs.
Purpose of the Universal Waste Rule

In 1995, in order to facilitate hazardous waste recycling, the EPA established simplified regulations for gathering and disposal of certain broadly generated waste, designated as universal waste.

These wastes are subject all hazardous waste regulations, and they are not required to be calculated as hazardous waste when concluding a school’s generator status.
CHEMICAL HYGIENE PLAN - CHP Action Plan

• Substances Included Within the Universal Waste Rule

Universal wastes identified in the Rule are listed below.

– Hazardous waste batteries
– Fluorescent lamps
– Mercury-containing devices (thermostats, thermometers, etc.)
– Pesticides that have been retracted, put on hold, or gathered for discarding
– Oil-based finishes
– Photographic solutions
SAFETY DURING INVENTORY
Safety During the Inventory

• Wear appropriate personal protective equipment (PPE) when conducting the inventory. This should include closed-toe shoes, safety glasses, and latex or nitrile exam gloves (at a minimum).

• The chemical inventory should only be performed by personnel who have adequate knowledge and experience with chemical safety and use. Students should not be permitted to perform the chemical inventory. Make a note of any such hazardous conditions on the inventory form.

• Chemicals may pose risks because of their hazardous characteristics (flammability, corrosivity, reactivity or toxicity) and/or because their containers and contents may have deteriorated over time. Chemicals that have become shock-sensitive or containers that have become pressurized or damaged can cause serious injuries.
Safety During the Inventory

• Don’t move bulging, leaking, or deteriorated containers, unless you are sure it is safe. Don’t move any container that contains crystals in a liquid or both liquid and solid phase chemical. These are potentially explosive and should be left alone.

• Don’t attempt to open any unidentified solvent bottles, or bottles that contain any of the peroxide-forming chemicals.

• During the inventory, you will likely have to move and turn some chemical containers to be able to read the label. A flashlight and small mirror should be on hand to enable you to read labels on the backs of containers that are not safe to move, and to see items in the back of storage cabinets.
Safety During the Inventory

• Always have a telephone or other means of communication handy to summon help in the event of a spill or emergency. Review the written spill response plan that includes a list of emergency phone numbers.

• Also note the locations of the nearest emergency eyewash and shower before starting the inventory in each area.

• Wear appropriate personal protective equipment (PPE) when conducting the inventory. This should include closed-toe shoes, safety glasses, and latex or nitrile exam gloves (at a minimum).
Safety During the Inventory

• The chemical inventory should only be performed by personnel who have adequate knowledge and experience with chemical safety and use. Students should not be permitted to perform the chemical inventory. Make a note of any such hazardous conditions on the inventory form.
Schools Chemical Cleanout Campaign (SC3) 2015

Application

The Excel Workbook will contain the following worksheets:

<table>
<thead>
<tr>
<th>Package Contents</th>
<th>Worksheet</th>
<th>Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration Information</td>
<td>General school identification information form. Please complete all entries.</td>
<td></td>
</tr>
<tr>
<td>Questionnaire</td>
<td>A chemical management questionnaire pertaining to your school's current management practices, policies, and procedures.</td>
<td></td>
</tr>
<tr>
<td>Chemical Inventory (Known)</td>
<td>A worksheet used to inventory all of your school's known chemicals. Please fill in as much detail as you can on this worksheet to identify and list the chemicals.</td>
<td></td>
</tr>
<tr>
<td>Chemical Inventory (Unknown)</td>
<td>A worksheet used to inventory any chemicals that are unlabeled, or unknown. Please fill in as much detail as you can on this worksheet to help identify any substances that are difficult to identify (e.g. missing labels, illegible labels).</td>
<td></td>
</tr>
</tbody>
</table>
Registration Information

This worksheet contains basic information related to your school and the contact person whom, if the school is selected, will be actively involved in the SC3 Cleanout Project. Please complete all of the information related to your school’s name, location, mailing address, and school district information. Information is also requested relating to your school’s population, curriculum, and facility information. If your school is selected for this project, the emergency contacts will need to be present on the day that the chemical cleanout will take place.
# PADEP 2012 School Cleanout Registration Information

**Date of Application (mm-dd-yyyy)**:  

<table>
<thead>
<tr>
<th><strong>School Identification</strong></th>
<th><strong>School District Details</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>School Name:</strong></td>
<td><strong>District:</strong></td>
</tr>
<tr>
<td><strong>Contact Person:</strong></td>
<td><strong>Title:</strong></td>
</tr>
<tr>
<td><strong>Street:</strong></td>
<td><strong>Mailing Address:</strong></td>
</tr>
<tr>
<td><strong>City:</strong></td>
<td><strong>Phone:</strong></td>
</tr>
<tr>
<td><strong>Municipality:</strong></td>
<td><strong>Address:</strong></td>
</tr>
<tr>
<td><strong>County:</strong></td>
<td><strong>City:</strong></td>
</tr>
<tr>
<td><strong>State:</strong></td>
<td><strong>State:</strong></td>
</tr>
<tr>
<td><strong>Zip Code:</strong></td>
<td><strong>Zip Code:</strong></td>
</tr>
<tr>
<td><strong>Phone No.:</strong></td>
<td><strong>Fax No.:</strong></td>
</tr>
<tr>
<td><strong>Email:</strong></td>
<td><strong>Country:</strong></td>
</tr>
</tbody>
</table>

**Mailing Address (if different from School Address)**:  
**Name:** | **Title:** |
| **Street:** | **City:** |
| **State:** | **Zip Code:** |
| **Phone:** | **24 Hr. Phone:** |

**School Type (please check all that apply)**:  
- High School
- Vocational/Technical HS
- Public
- Private
- Parochial
- Charter
- Elementary School
- Middle School

**Student Population (please check appropriate box)**:  
- 1 - 500
- 501 - 1,000
- 1,001 - 1,500
- 1,501 - 2,000
- 2,001 - 3,000
- 3,001 - 4,000
- 4,001 - 5,000
- 5,001+

**School Curriculum Information (please check all that apply)**:  
- Chemistry
- Biology
- Physics
- Photography
- Auto Repair
- Carpentry
- Industrial/Metal Shop
- Painting (Art)
- Earth/Physical Science
- Anatomy & Physiology
- Cosmetology
- Culinary Arts
- Construction Trades

**School Facility Information (please check all that apply)**:  
- Secure Chemical Storage Room
- Kitchen Facilities
- Grounds/Landscaping
- Maintenance Department
- Vehicle/Small Engine Maintenance

**Certification**: I certify under penalty of law that I have personally examined and am familiar with the information submitted, and that based on my inquiry of those individuals responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete.

**Optional Attachments**
- Site Floor Plan
- Current Chemical Management Plan
- PA Dept. of Labor & Industry Hazardous Substance Survey Form (HSSF)

**Name and official title of authorized representative**

---

Electronic Signature (optional)
WORKSHEET NO. 2

Questionnaire

This worksheet asks a series of questions related to your school’s current chemical management practices, policies, and procedures. You may need to solicit information from several sources, in order to answer all the questions presented. Please include a description of the corresponding conditions, as well as you can. The more detail you provide, the better we will be able to evaluate your school’s needs.
# Questions Regarding Your Schools Current Management Practices, Policies and Procedures

<table>
<thead>
<tr>
<th>Program Component</th>
<th>Questions</th>
<th>Yes/No</th>
<th>Description of Conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Purchasing</strong></td>
<td>Does the school have a purchasing policy or an approved chemical list?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Does one person or a department make all chemical purchases? If so, please identify the person and/or department.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are chemicals purchased for expected use within the calendar or fiscal year?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Does the school have a &quot;green&quot; or &quot;micro-scale&quot; chemistry curriculum?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Have toxic chemicals been replaced with less toxic alternatives?</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Storage</strong></td>
<td>Does the school have a policy or set of procedures for storing chemicals (a Chemical Management Plan)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Does the school have one central chemical storage location? If so, where is it located (e.g., identify by building, floor, wing, room number)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Is there a staff member assigned to manage every chemical storage area? If so, please identify that person.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are stored chemicals kept locked?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are chemicals accessible only to qualified handlers?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are chemicals properly stored? (proper storage container, storage area is adequately ventilated, secured, in a closeable cabinet, sturdy shelving)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Are all chemicals labeled, including name, purchase/expiration dates, and storage information (date received, date opened)?</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Do all chemicals have up-to-date Material Safety Data Sheets (MSDS)? If so, please identify where the MSDS are stored.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Does the school annually submit a Hazardous Substance Survey Form (HSSF) to the Pennsylvania Department of Labor and Industry? If so, please provide a copy of the school’s most recent HSSF with your application package.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Chemical Inventory (Known)

This worksheet is an inventory form to be used to list all of the chemicals found in your school classrooms and throughout the school buildings. Please solicit information throughout your school, including teachers and school staff who may utilize chemicals, mercury-containing equipment or thermometers from nursing areas and science departments, and materials used in vocational or technical programs (e.g., art classes). A listing of common chemicals and their CAS Registry Number can be found at:

http://oaspub.epa.gov/enviro/tri_lookups.tri_cas_lookup.
**NOTE**

This project will not accept waste coming from the maintenance of vehicles. This includes waste oil, cleaning solvents and other chemicals used for maintenance. The project will not accept bulk containers or other wastes generated by maintenance operations, such as solvents, floor cleaning solutions, waxes, etc. The intent of this project is to help schools clean out excess hazardous and dangerous chemicals (primarily coming from chemistry and the science departments). Furthermore, all bulk containers of waste pesticides will need to be arranged through the Pennsylvania “CHEMSWEEP Program”. If you have waste pesticides needing disposal, please see information on the following website:

http://www.agriculture.state.pa.us/portal/server.pt/gateway/PTARGS_0_2_24476_10297_0_43/http;/10.41.0.36/AgWebsite/ProgramDetail.aspx?name=CHEMSWEEP-Waste-Pesticide-Disposal-Program&navid=12&parentnavid=0&palid=108&
# Chemical Inventory (Known)

<table>
<thead>
<tr>
<th>Current Location</th>
<th>Chemical Name</th>
<th>Number of Containers</th>
<th>Container Size</th>
<th>Container Type</th>
<th>Condition of Container</th>
<th>Chemical Uses?</th>
<th>Needed or in Surplus Quantities</th>
<th>CAS Number</th>
<th>Risk Level</th>
<th>Health Hazard Rating</th>
<th>Flammability Hazard Rating</th>
<th>Reactivity Rating</th>
<th>Special Hazard Rating</th>
<th>Hazards</th>
<th>Expiration Date (mm-dd-yy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room 312</td>
<td>Acetaldehyde</td>
<td>1</td>
<td>1 L</td>
<td>Glass</td>
<td>Degraded top</td>
<td>Chemistry Lab</td>
<td>Surplus</td>
<td>75-07-7</td>
<td>3</td>
<td>3</td>
<td>4</td>
<td>2</td>
<td></td>
<td>Suspect carcinogen. Highly flammable. Peroxide former. Severe irritant to eyes</td>
<td>01/01/07</td>
</tr>
</tbody>
</table>

Note: Additional rows can be added as needed; on the File menu: select "Insert" then "Rows".
Chemical Inventory (Unknown)

This worksheet is an inventory form for any chemicals or bottles you may come across that are difficult to identify. In these instances, please provide as much information as you can safely collect from the substance and/or its container.
### Chemical Inventory (Unknown)

<table>
<thead>
<tr>
<th>Current Location</th>
<th>Number of Containers</th>
<th>Container Size</th>
<th>Container Type (plastic, glass, metal)</th>
<th>Condition of Container (corroded, has crystals around the cap, bulging, degraded top)</th>
<th>Expiration Date (if known)</th>
<th>Physical State (solid, liquid, gas)</th>
<th>Appearance (color, viscosity, phase separation)</th>
<th>Density</th>
<th>Boiling Point (°C)</th>
<th>Vapor Pressure (mm Hg)</th>
<th>Solubility in Water</th>
<th>Melting Point</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room 312</td>
<td>1</td>
<td>1 L</td>
<td>Plastic bottle (EXAMPLE)</td>
<td>Corroded, crystals around the cap</td>
<td>N/A</td>
<td>Liquid</td>
<td>Milky white liquid</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
</tr>
</tbody>
</table>

Definitions: °C = degrees Celsius; mm Hg = millimeters of mercury. Note: Additional rows can be added as needed; on the File menu: select “Insert” then “Rows.”
Lessons Learned

Communication
Coordination
Preparation
### TABLE 2
**SUMMARY OF MANIFESTS**

**2012 SCHOOL CHEMICAL CLEAUNOUT PROJECT**

<table>
<thead>
<tr>
<th>School Designation</th>
<th>County</th>
<th>DEP Region</th>
<th>Dates of Removal</th>
<th>Total Amount of Chemicals Removed (lbs)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Albert Gallatin HS</td>
<td>Fayette</td>
<td>5</td>
<td>August 13 and August 16, 2012</td>
<td>180</td>
</tr>
<tr>
<td>2 Allderdice HS</td>
<td>Allegheny</td>
<td>5</td>
<td>August 16, 2012</td>
<td>621</td>
</tr>
<tr>
<td>3 Antietam Middle-Senior HS</td>
<td>Berks</td>
<td>3</td>
<td>August 7-8, 2012</td>
<td>84</td>
</tr>
<tr>
<td>4 Brandywine Heights HS</td>
<td>Berks</td>
<td>3</td>
<td>August 10, 2012</td>
<td>443</td>
</tr>
<tr>
<td>5 Central Tech Career and Technical School</td>
<td>Erie</td>
<td>6</td>
<td>August 15, 2012</td>
<td>285</td>
</tr>
<tr>
<td>6 Cumberland Valley HS</td>
<td>Cumberland</td>
<td>3</td>
<td>August 1-2, 2012</td>
<td>738</td>
</tr>
<tr>
<td>7 Eastern Lebanon County H5</td>
<td>Lebanon</td>
<td>3</td>
<td>August 10, 2012</td>
<td>162</td>
</tr>
<tr>
<td>8 Emmaus HS</td>
<td>Lehigh</td>
<td>2</td>
<td>August 10, 2012</td>
<td>385</td>
</tr>
<tr>
<td>9 Farrell Area H5</td>
<td>Mercer</td>
<td>6</td>
<td>August 15, 2012</td>
<td>260</td>
</tr>
<tr>
<td>10 Hamburg Area H5</td>
<td>Berks</td>
<td>3</td>
<td>August 10, 2012</td>
<td>230</td>
</tr>
<tr>
<td>11 Iroquois Junior-Senior H5</td>
<td>Erie</td>
<td>6</td>
<td>August 15, 2012</td>
<td>117</td>
</tr>
<tr>
<td>12 Line Mountain Senior H5</td>
<td>Northumberland</td>
<td>4</td>
<td>August 1-2, 2012</td>
<td>93</td>
</tr>
<tr>
<td>13 Nativity BVM H5</td>
<td>Schuylkill</td>
<td>2</td>
<td>August 7-8, 2012</td>
<td>660</td>
</tr>
<tr>
<td>14 Oley Valley H5</td>
<td>Berks</td>
<td>3</td>
<td>August 7-8, 2012</td>
<td>119</td>
</tr>
<tr>
<td>15 Penn Hills Senior H5</td>
<td>Allegheny</td>
<td>5</td>
<td>August 16, 2012</td>
<td>125</td>
</tr>
<tr>
<td>16 Southern Columbia Area H5</td>
<td>Columbia</td>
<td>4</td>
<td>August 2, 2012</td>
<td>87</td>
</tr>
<tr>
<td>17 St. Hubert Catholic H5 for Girls</td>
<td>Philadelphia</td>
<td>1</td>
<td>August 8, 2012</td>
<td>629</td>
</tr>
<tr>
<td>18 Trinity H5</td>
<td>Cumberland</td>
<td>3</td>
<td>August 2, 2012</td>
<td>269</td>
</tr>
<tr>
<td>19 Upper Dauphin Area H5</td>
<td>Dauphin</td>
<td>3</td>
<td>August 1-2, 2012</td>
<td>191</td>
</tr>
<tr>
<td>20 Yough H5</td>
<td>Westmoreland</td>
<td>5</td>
<td>August 13 and August 16, 2012</td>
<td>1,330</td>
</tr>
</tbody>
</table>

**TOTAL AMOUNT OF MANIFESTED CHEMICALS**  7,017
Disposal contractor (PSC) placing flammable liquids into a 60-gallon disposal drum
Disposal contractor (PSC) placing flammable liquids into a 60-gallon disposal drum
Disposal contractor (PSC) pouring a spill control absorbent (vermiculite) into a 60-gallon disposal drum
Full, sealed, and labeled disposal drums in the loading dock area for overnight storage
Disposal contractor (PSC) loading the hazardous material disposal drums into the disposal truck
Room 202 where surplus chemicals were placed for disposal by Rockwood High School
Disposal contractor (PSC) doing inventory and record keeping of chemicals for disposal
Disposal contractor (PSC) pouring a spill control absorbent (vermiculite) into a 30-gallon disposal drum
Disposal contractor (PSC) transporting hazardous waste drums to the disposal truck
High Hazard Stabilization - Setup
High Hazard Stabilization - Equipment
High Hazard Stabilization - Cap Removal
High Hazard Stabilization – Peroxide Testing
High Hazard Stabilization – Addition of Hydroquinone
High Hazard Stabilization – Lab Pack