Environmental Quality TFS Supplement

HAZARDOUS MATERIAL and SOLID WASTE MANAGEMENT BACKGROUNDER

Introduction

All educational institutions generate wastes (unwanted or discarded solid, semi-solid, liquid, or gaseous materials) in cafeterias, offices, classrooms, gyms, and custodian closets. Among the materials, activities and wastes of greatest concern in the school are those classified as "hazardous".

Definitions

A material may be considered hazardous if it exhibits any **one** of the following characteristics:

- *Ignitable* - Easily combustible or flammable (has a flash point below 140⑤ F).
- *Corrosive* - Aqueous-based liquid with a pH of less than or equal to 2.0 (acid) or a pH of greater than or equal to 12.5 (alkaline).
- *Reactive* - Unstable or undergoes violent chemical reactions with water or other non-corrosive materials.
- *Toxic* - Exceeds the regulatory limit for certain constituents.

It may also be hazardous if it appears on any of four lists of hazardous wastes contained in the federal Resource Conservation and Recovery Act Regulations, and classified as type F, K, P (acute), and U wastes. Acute (P Listed) wastes, including some pesticides, have been determined by the U.S. Environmental Protection Agency (EPA) to be so dangerous in small amounts that they are regulated more stringently.

There are a wide variety of health impacts to students and staff when they are exposed to these dangerous materials through direct skin or eye contact, ingestion, or inhalation. Sensitive individuals can also suffer severe allergic reactions or asthma attacks in response to the strong odors associated with some of these materials.

1. ***Chemical Hazard Communication Standards*** were issued by the Occupational Safety and Health Administration (OSHA) in 1992 to ensure that hazard information is communicated to all personnel through:
   - *Labels on containers*

Hazardous Waste Generators

Products and activities using hazardous materials in schools are common and often necessary for instruction and maintaining the facility. However, when hazardous materials become wastes (due to finished use, expiration, etc.), the material must be handled properly according to state and federal rules. The requirements of schools for hazardous waste handling is, in part, dictated by the amount of hazardous waste generated at the school in any calendar month.

Of the three classifications of generators, the smallest, *Conditionally Exempt Generators (CEG)*, should be the goal of school operators. A CEG facility generates no more than 220 lbs (100 kg) or about 25 gallons of hazardous waste, and no more than 2.2 lbs (1 kg) of acute hazardous waste.

Transportation of Hazardous Wastes

If your school stores, ships, and transports regulated quantities of hazardous waste you must comply with state environmental regulations and appropriate U.S. Department of Transportation shipping requirements. This may include obtaining an EPA Identification Number and appropriate hauling permits (if you haul yourself) for manifesting and tracking your waste to its final disposition. You may also be required to retain copies of all shipping manifests for at least five years. If you have any questions, contact your local or state environmental quality officials.

Training

To reduce the safety and health risks of the staff and students, hazardous material training is necessary and even required in many states. Training should include these topics:

- ❷ *Training*
- ❷ *Material Safety Data Sheets* (*MSDSs*)

  By reviewing the information on a product's MSDS, you can:
  - Avoid the purchase of hazardous products before you buy them
  - Learn how to use a product properly
  - Protect staff and students when using the product
  - Dispose of the resultant wastes properly

2. ***Hazardous Waste Operations and Emergency Response Standards*** were issued by OSHA to protect workers in cleanup operations at hazardous waste sites and facilities, and workers responding to emergencies involving hazardous materials, such as leaks or spills.
3. ***Emergency Planning and Community Right-to-Know Act*** This act was established by the U.S. Environmental Protection Agency (EPA) in 1986, and has four major parts:
   - ❷ *Emergency planning at the state and community level*
   - ❷ *Emergency notification of chemical accidents*
   - ❷ *Community right-to-know reports regarding hazardous chemicals*
   - ❷ *Toxic chemical release reporting to the public*

Procurement, Use, Storage, and Disposal

Hazardous materials may be found throughout school facilities, including custodial closets, offices, arts and science classrooms, vocational study areas, and facility maintenance shops. Minimizing exposure to these materials involves knowledgeable decision-making and planning through all phases of their life cycle: purchase, use, storage, and disposal. The following summary guidance incorporates best management practices, but may not assure full compliance with all environmental, health and safety, ordinances, codes and regulations.

Procurement When making purchasing decisions, select less hazardous products; if necessary use the MSDS for more information (for example, see following tables on Common Hazards Found in Offices, and Alternative Art Supplies). Buy only as much as you need for each project, in the smallest appropriate container sizes, to reduce the possibility of spills and leaks from partially-filled containers. Consider substituting water-based products for those that are oil-based to reduce emission of volatile organic compounds and to eliminate the need for hazardous solvents for cleanup. In maintenance shops, avoid purchasing products containing chlorinated compounds, corrosive cleaners, products with a flash point below 140°F, aerosol products, and terne-plated oil filters (high metal content). Avoid overuse of pesticides by implementing an Integrated Pest Management Program (see *Pest Management in Schools Backgrounder*), and by selecting native, drought- and pest-resistant plants and seeds for landscaping. If carpeting is to be installed, (a) purchase carpet and adhesives that have low VOC emission rates (see manufacturer's information), (b) unroll and air out carpet in a well-ventilated unoccupied space (e.g., a warehouse) for several days before installation, and (c) install when spaces will be unoccupied for several days after installation, and will be supplied with outdoor air ventilation.

COMMON HAZARDS FOUND IN SCHOOLS AND OFFICES

Hazards	Source	Effect
Ammonia	Duplicating machine solvent	Eye, throat, and nose irritant

Asbestos	Ventilation shafts, ceiling tiles, insulation	Asbestosis; eye irritant; lung cancer
Benzene and Toluene	Rubber cement, some cleaners, stencil fluid, copier toner, liquid eraser	Eye, nose, and skin irritant; headaches; dizziness; leukemia
Irritants	Adhesives, inks, rubber, carbon, cleaning fluids	Skin irritations, dermatitis; allergic reactions
Formaldehyde	Insulation, glues in new carpeting, building materials (pressed wood products)	Eye, nose, mouth, and throat irritant; allergic reactions; nasal cancer
Ozone	Copy machines, electrical equipment	Eye and nose irritant; coughing; chest pains
Trichloroethylene (TCE)	Correction fluids, inks, adhesives, cleaning fluids	Eye, skin, and nose irritant; fatigue; possibly liver and kidney cancer
Trinitro-fluorenone (TFN) and Nitropyrenes	Copy machine toner	Suspected cancer-causing agent

Source: Alaska Health Department. 1993. ***Office Waste Reduction Guide.*** Anchorage, AK: Alaska Health Project.

ALTERNATIVE ART SUPPLIES	
Products	**Alternatives**
Ceramic glazes and copper enamels (sources of lead)	Water-based and acrylic-based paints
Commercial dyes	Vegetable and plant dyes
Powdered tempera paint (may irritate respiratory tract)	Premixed, liquid tempera paint
Pastels, chalks, or dry markers (may contain toluene or other toxic chemicals)	Crayons, dust-free chalks, and oil pastels
Solvent-based materials (may be toxic, carcinogenic)	Water-based products
Aerosols (product loss high due to overspray or residuals left in can; hard to dispose of)	Non-aerosol products
Products containing heavy metals, such as lead (waste may be hazardous)	Products without heavy metals (see MSDSs)
Photographic chemicals (may be toxic)	Send film to professional lab for developing

Source: Chase, J. 1995. ***Blueprint for a Green School.*** New York, NY: Scholastic, Inc.

Usage Proper use of hazardous materials starts with observing the product label, then reading and following the directions. Use only the amount of product recommended and no more than needed to do the job. Know when to use additional safety precautions such as fume hoods, additional ventilation, and personal protection (below). To reduce the risk of accidental ingestion, eating and drinking should not be permitted when working with hazardous materials, nor should these materials be stored near food.

Storage and Disposal Store hazardous materials in well-labeled, original containers with tight-fitting lids to minimize spillage and leakage. Lids should be put back on the containers immediately after dispensing the product. To prevent unexpected reactions, incompatible materials should not be stored together. Consider using locks to limit access to cabinets where hazardous products are stored. If materials are being stored that are no longer needed, dispose of properly and according to environmental regulations, or donate to another school that has a need for them.

Personal Protection

To help minimize the exposure of staff and students to a variety of chemical and equipment hazards, personal protective equipment should be used. Personal protective equipment includes old clothing, aprons, safety glasses, ear plugs, safety shoes, and filter masks.

Before using a product or beginning an activity, determine the level of protection that is needed by contacting the school or district safety officer, or looking for other clues:

- Are there warning labels such as "caution," "danger," or "toxic"?
- What hazards or precautions are listed in the Material Safety Data Sheet for that product?
- Will you be working with a liquid, solid, dust, mist, vapor, gas, radiation, etc.?
- Do the activity or chemical instructions recommend any personal protective equipment?

Remember that just having personal protective equipment in the school building or classroom is not enough - staff and the students must know where the equipment and clothing is located and when and how to use it.

Solid Waste

Solid waste or garbage is the most common of the wastes produced in a school so all efforts should be made to reuse and recycle materials when possible. In order to ensure that solid waste is safely stored and disposed of, a school must:

(1) store all solid waste between collections in containers which have lids, are corrosion-resistant, and are constructed to minimize insect and rodent attraction and harborage;
(2) clean all solid waste containers with sufficient frequency to maintain them in a condition which minimizes insect and rodent attraction;
(3) for exterior containers other than dumpsters or compactors, use stands which prevent the containers from being tipped, protect them from deterioration, and allow easy cleaning below and around them. Dumpsters or compactors must be located on or above a smooth surface of non-absorbent material, such as concrete or asphalt, that is maintained in clean and good condition;(4) transport or use a private or municipal hauler to transport the solid waste at least weekly to a landfill site approved by the department. Transport waste in a covered vehicle or covered container.
(4) transport or use a private or municipal hauler to transport the solid waste at least weekly to a landfill site approved by the department. Transport waste in a covered vehicle or covered container.

This document has been developed for the H.E.L.P. for Kids Project. Contributing to this backgrounder: Dr. Michael P. Vogel, Montana State University Extension Service; Bradley Turk, Mountain West Technical Associates

Typical School Wastes

Cleaning Solvents. Be cautious with spent solvents as they could be hazardous wastes and have to be treated as such. Liquid solvents should not be disposed of in a landfill or down the drain.

Food Wastes. Grease should not be poured down the drain or into the dumpster. Instead, have grease hauled to a rendering plant where it can be made into packing grease for industrial purposes. Non-fatty foods, such as vegetable wastes can be composted. Reuse or recycle empty food containers if possible.

Used Oil. Used oil should be reused as fuel in industrial school heaters or recycled. Used oil should not be used to suppress dust on roads or parking lots, poured down the drain, or discarded in the dumpster.

Grounds Yard Waste. Tree branches, grass clippings, school grounds should be mulched or composted either on-site or at a local composting facility.

Construction Wastes. Construction wastes should be reused if possible. Non-painted and untreated wood waste can be mulched and used in landscaping on-site, composted at a licensed composting facility, or disposed of in a certified landfill. Painted/treated wood waste, wall board, nails, carpet, etc., should also be disposed of in a certified landfill

Glass bottles and jars, plastic, scrap metal, office paper, newspaper and cardboard should be reused or recycled.