



Emergency and Spill Response Procedures

**from Chapter 4 of the
AU Chemical Waste Management Guide**

Introduction

The purpose of this section is to provide information about the correct steps to take when chemicals are spilled or released. Environmental Health & Safety along with local Emergency Response Agencies (i.e., AU Department of Safety & Security (AUDPSS), Auburn Fire Department, and Opelika Haz Mat Team) are the primary entities that respond to releases and accidents involving hazardous materials. **All laboratories should develop and practice their own emergency plans;** these should be readily accessible and include all emergency contact numbers and evacuation procedures. Contact EHS directly updates of this information.

For general information on managing emergencies at the University, go to AUDPSS's web page at http://www.auburn.edu/administration/public_safety/emergency/.

Materials that are generated as a result of spill cleanup are considered to be hazardous waste if the original material when disposed of would have been a hazardous waste. These materials must be managed as described in Chapter 3.

There are **two general types of spills:**

- Complicated spills, which require assistance from outside the laboratory, and
- Simple spills, which you can clean up yourself.

Complicated Spills

A spill of any material should be treated as a complicated spill if the result might be fire, explosion or a situation immediately dangerous to life and health. These are considered to be high hazard emergencies. High hazard chemical spills or releases are handled by the University's Hazardous Materials Response Team (HMRT), with assistance by local Emergency Response Agencies. Your call to the City of Auburn Police (911) will summon them. They stock self-contained breathing apparatus and other protective equipment that allows them safe entry into the hazardous area.

Evacuate the immediate area of a complicated spill. At a safe location, call 911 and stay on the line until told to hang up by the police dispatcher. Then, call AUDPSS at 844-8888 to assure that the HMRT is alerted. In larger incidents, evacuate the entire building, either personally or with the assistance of the building authority. All personnel leaving the building or area should gather upwind from the spill at a safe distance away from the spill. Laboratory managers should verify that all persons are accounted for. Those persons involved in the incident should remain in the area outside the involved building to assist the emergency response agencies when needed. Information, such as the

chemicals or biohazardous agents involved, will be needed by the various responding agencies. After relaying the vital information, laboratory personnel should notify the principal investigator and the department head.

If any emergency involves personal injury or chemical contamination, call 911 from any available phone and ask for an ambulance to be sent to the area. Be sure to state your name, telephone number, your exact location and the type of contaminant on the victim. In cases where corrosive chemical exposure to the eyes or body of an individual occurs, carefully assist the injured person to an eyewash station, deluge shower or combination unit, then call 911. For other chemical exposures, consult the MSDS for that chemical and follow the recommendations in the first aid section as you wait for emergency personnel to arrive. A copy of the MSDS should be available for the ambulance crew and should accompany the victim to the hospital.

Simple Spills

A simple spill is defined as one that:

- Generally is less than one gallon;
- Does not spread rapidly;
- Does not endanger people or property except by direct contact; and
- Does not endanger the environment.

Only chemical spills that meet **all four** of these criteria can be defined as “simple”. Everything else is a complicated spill. If you have any doubt about whether a spill can be classified as “simple”, contact 911 immediately.

A simple spill can and should be neutralized, absorbed, or otherwise managed by the user of the chemical. Important factors that help you to determine whether you have a simple spill are:

- amount of chemical spilled
- which chemical has spilled
- the hazardous characteristics of the chemical
- where the spill has occurred
- the proper method for cleaning up the spill
- whether suitable personal protective equipment is readily available

Spill Prevention

Prepare for emergency control of chemical spills. Experience has shown that the accidental release of hazardous substances is sufficiently common to require pre-planning for procedures that will minimize exposure of personnel and property. Personnel protection is of primary importance and cleanup of spills is secondary.

Pre-planning: Consult the MSDS.

Pre-planning is the best way to prevent spills or to control them when they do happen. In order to be prepared for an emergency, know the hazards of each compound with which you work. Assess the risks before using any chemical, and have a laboratory emergency plan for all procedures with hazardous materials on file and posted in a conspicuous area for employees and emergency responders. Post emergency phone numbers and home phone numbers of laboratory supervisors, so they are immediately available.

When using a hazardous substance, consider the toxicity, reactivity, corrosivity, and flammability of the compound, the amounts involved, the expected duration of your exposure to the compound, and potential routes of entry for the chemical (i.e., inhalation, ingestion, skin contact).

Listed below are some basic spill prevention steps that apply to storage, transportation and transfer of chemicals.

General precautions

- Reduce clutter and unnecessary materials in your work areas.
- Eliminate tripping hazards and other obstructions.
- Have all needed equipment readily available before starting work.

Storage precautions

- Use sturdy shelves.
- Larger containers should be stored closer to the floor.
- Containers on shelves should be stored away from the edge to reduce the danger of falling.
- Storage shelves should have lips to further reduce the danger of falling.
- Chemicals should be stored by compatibility class.
- Inspect the storage area regularly for leaking or defective containers.
- Use appropriate storage containers.
- Use engineering controls such as trays, bottle carriers, break-resistant containers in laboratories and stock rooms.

Transportation precautions

- Use carts, where appropriate.
- Use safety containers, where appropriate.
- Use bottle carriers for 2.5 and 4.0 liter bottles.
- Use straps to secure containers, where appropriate.
- Think about potential hazards before transporting chemicals.
- Consider purchasing plastic coated “shatter resistant” bottles.

Precautions in transferring chemicals

- Pay careful attention to the size of container to avoid overfilling
- Use pumps or other mechanical devices rather than simple pouring
- Provide containment to capture leaks and spills

Spill Response Equipment

Laboratories should keep an inventory of basic chemical spill equipment on hand in each area where hazardous material/waste is used or stored. These materials should be capable of at least stopping the spread of spilled chemicals to drains or other areas. Prior to starting any work with chemicals, make sure that you have all the necessary personal protective devices, safety equipment, and containment/cleanup materials listed in the MSDS readily available.

Each individual who may be involved in spill response or cleanup must know the purpose and limitations of each item in the spill kit. You may buy prepackaged spill kits from various vendors; however, these kits tend to be expensive. Many chemical users prefer to stock their own. The next section lists items that should always be readily available in your laboratory for cleaning up spills.

Spill Kits

Most of the contents of a spill kit are common items which may be dispersed throughout your lab. These should be consolidated and readily available in an emergency. Assign someone to be responsible for inspecting and restocking the contents on a scheduled basis. Post the list of contents and the inspection schedule near or in the kit. Laboratories that use only small amounts of chemicals can use lab towels or paper towels when these are compatible with the spilled material. Other areas, such as chemical store rooms and maintenance shops will require more extensive supplies. The contents of your spill kit need not be limited to this list. For more detailed information regarding spill kits for particular chemicals and/or processes, contact EHS.

Eye protection

Safety glasses are the absolute minimum for working in a laboratory or cleaning up spills of hazardous materials; for corrosive and/or reactive materials, chemical splash goggles or a face shield are also necessary.

Skin protection

All personnel in laboratories should at least be wearing a lab coat. If splashing is a possibility, an apron should be worn as well.

Gloves

Chemical resistant gloves; such as heavy nitrile, butyl, or neoprene gloves and one box of disposable polyethylene gloves are recommended for each person involved in a cleanup. Plan on involving at least two people per cleanup.

Shoes

Closed-toed, non-porous shoes which cover the entire foot are a must when working with chemicals.

Respiratory Protection

We do not recommend that you use respirators because if your spill results in the generation of toxic vapors, it is a high-hazard emergency (i.e., a complicated spill). You should evacuate and let the trained professionals of the Hazardous Materials Response Team and/or local emergency agencies handle the spill. **You must not use a respirator unless you have been trained, medically evaluated and fit-tested.** Contact the Office of Occupational Safety at 844-4870 for more information on respirator usage.

Spill Cleanup Agents

General use absorbents

- Calcium bentonite can be used on just about any kind of spill except Hydrofluoric Acid.
- Kitty litter and sand can be used on less hazardous spills and applied for traction in slippery areas.
- Paper towels and spill pads can be used to quickly absorb spills. Specialized spill pillows which can neutralize, and reduce the flammability, reactivity, and toxicity of liquid acids, caustics, and solvents are commercially available.

Specific use absorbents

- Stock sodium bisulfate (to neutralize bases) and sodium bicarbonate (to neutralize acids).

- A 1:1:1 mixture of sand, soda ash, and kitty litter can be applied to solvent spills.
- A dilute sodium thiosulfate solution is recommended for spills involving cyanides.

Disposable Tools

- Non-metallic scoops should be used to sprinkle absorbents onto spills and to mix the absorbent into the spill.
- A chemical resistant sponge mop and bucket are needed for cleaning the floor after neutralization and absorption. These must be made out of non-sparking materials. (These are not provided by Building Services. Contact EHS for more information.)
- A chemical resistant dust pan and brush are needed to collect absorbent material. These must be made out of non-sparking materials.
- A 5-gallon bucket with lid or other similar container types should be used to contain these supplies.

Materials for Spill Collection

- Heavy duty plastic bags are needed to collect the spilled material and contaminated cleanup materials for disposal.
- Stock Waste Chemical tags to properly label the material for disposal. Include the name of the contaminant.

Location of the Spill Kit

Spill control kits should be clearly marked, highly visible and located near an exit so that you won't have to enter the contaminated area to have access to the kit. Make sure all personnel know the kit's location, are familiar with the kit's contents, and understand its limitations.

Spill Reporting

Spills and releases of hazardous materials in significant amounts should be reported to Auburn Police (911). No notification of emergency responders is necessary for simple spills. However, EHS is always available for advice.

Even a small amount of spilled flammable liquid or reactive substance can present a significant fire hazard. There are many ignition sources in laboratories. Remove all potential sources of ignition, when possible. If, however, the vapors from a flammable spill are in the vicinity of an ignition source, such as a pump, it may be advisable to shut off power from a remote circuit breaker box. Do not hesitate to evacuate, notify Auburn Police (911) and AUDPSS, and pull the fire alarm if you are unsure of the spill's fire potential.

Any uncontained chemical that can disperse fumes, gases, or dust may be hazardous to your health and the health of those around you. If you suspect that the spilled or released chemical is toxic, evacuate the area. If others in the area could be exposed to the chemical, evacuate the area or building and follow the high hazard emergency procedures for reporting complicated spills shown below.

Reporting a complicated spill

From a safe place, call both Auburn Police (911) and AUDPSS (844-8888). Report that this is a chemical spill emergency and give:

- location of the spill
- name and amount of material spilled
- extent of injuries
- safest route to the spill
- your name
- telephone number and your present location
- stay on the line until told to hang up by the dispatcher

Spill Response Procedures

Persons involved with a spill or release of any hazardous material should evaluate the potential danger to themselves, others and the environment before attempting any action. If the situation allows, extinguish all open flames, leave the fume hood on and open windows if possible.

After you report a complicated spill

- alert all persons nearby
- close the door to the laboratory
- contact the Laboratory Manager or Principal Investigator
- evacuate the entire building for extremely toxic spills if necessary
- post personnel by commonly used entrances to the area to direct people to use other routes
- arrange for someone to meet the emergency responders

Persons causing simple spills of known materials are responsible for the cleanup to the extent of their abilities. These should be cleaned up immediately. Appropriate personal protective equipment should be used.

REMEMBER...

A simple spill

- Generally is less than one gallon
- Does not spread rapidly

- Does not endanger people or property except by direct contact
- Does not endanger the environment

Always err on the side of caution. When in doubt, get out!

CONTROL THE SPREAD of the liquid. The object of this initial step is to contain the spill. Make a dike around the liquid by placing absorbents or pillows at the outside edges of the spill.

Supplies Needed

- Absorbent material (e.g. paper towels, kitty litter, spill booms and/or pillows).

PREVENT THE SPREAD of fumes and vapors. If the substance is volatile or can produce airborne dusts, close the laboratory door to prevent the spread of fumes and vapors to other areas. **Keep fume hoods on.**

NEUTRALIZE acids and bases. Spills of most acids or bases should be neutralized unless toxic vapors are present. Use caution when neutralizing spills. The neutralization process often is vigorous, and can result in splashes and the generation of large amounts of heat. Once neutralized, acids and bases can be mopped up and rinsed down the drain. A neutralizing spill absorber greatly simplifies cleanup and disposal.

NOTE: Some spill pillows can not be used with hydrofluoric acid (HF). If you use hydrofluoric acid in your work, it is advisable to buy the spill pillows specially made for hydrofluoric acid or to use a neutralizing agent for cleanup. Sodium carbonate, sodium bicarbonate and sodium hydroxide are suitable neutralization agents for hydrofluoric acid.

Supplies Needed

- For acids: sodium bicarbonate, sodium carbonate or calcium carbonate.
- For bases: sodium bisulfate or monosodium phosphate.
- pH paper to indicate when spills of acids and bases have been neutralized.
- Specific agent: call EHS for advice.

ABSORPTION OF LIQUIDS Add the absorbents to the spill, working from the outer edges toward the center. Never use a vacuum cleaner or shop vacuum to collect flammable liquids.

Supplies Needed

- Absorbent material such as paper towels, oil-dry, or vermiculite, are relatively inexpensive and work well, although they are messy. A 25 pound bag of oil-dry will be sufficient for a one gallon solvent spill.

- Spill control pillows are an alternative way to absorb solvents, acids, and bases and are available from commercial suppliers.
- Activated carbon is an excellent adsorbent for solvents and especially odorous organic chemicals.

RECOVERY AND CONTAINMENT FOR DISPOSAL Spill residues and cleanup materials should be collected and placed into a wide-mouth plastic container. For dry powders or liquids absorbed to dryness, you can double bag the residue into plastic bags (clear bags are best) and place the sealed bags into a box. Place a completed CHEMATIX™ Waste Card on each container.

Supplies Needed

- Plastic bag, jar, bottle, jug, plastic pail or plastic bag.
- Forceps (to pick up broken glass), broom, shovel, dust pan.
- Mop and bucket.

DECONTAMINATION Decontaminate the area and affected equipment. For most hard surfaces, conventional cleaning with soap and water is appropriate. Ventilate the area if necessary. Open windows or use a fan. In some instances, we can test the air in the vicinity of the spill location to determine if air concentrations of the chemical have been lowered to an acceptable level.

Supplies Needed

- For most spills, conventional cleaning products applied with a mop or sponge will decontaminate satisfactorily.
- For more toxic chemicals, use a suitable solvent and call us for advice.

Management of Materials from Spill Cleanup

Materials that are generated as a result of spill cleanup are considered to be hazardous waste if the original material when disposed of would be a hazardous waste. **These materials must be managed as described in Chapter 3.**