

PRE-PLANNING FOR AND RESPONDING TO CHEMICAL SPILLS

(For assistance, please contact EHS at (402) 472-4925, or visit our web site at <http://ehs.unl.edu/>)

This SOP is intended to guide the user in preparing for and responding to chemical spills, so as to minimize the severity of such incidents. This SOP does not address spills or releases of infectious agents, radioactive materials, or mercury.

Pre-planning

It is critical that the user know the properties and hazards of individual chemicals that they work with because of varying routes of exposure, occupational exposure limits, and acute or chronic effects of exposure. All spill response decisions must be based on the actual chemical involved. The following information is intended only as general guidance. Consult the applicable Material Safety Data Sheets (MSDS) for specific guidance.

1. Review MSDSs to become familiar with the physical and health hazards of chemicals used and stored in the work area. Note and adhere to recommendations regarding special precautions, spill equipment, and controls.
2. Identify and document procedures and/or equipment failures that could result in releases or exposures. If possible, make modifications in the process to minimize or eliminate the possibility of releases or exposures.
3. Identify area specific features that may increase or decrease the potential for spills or exposures, as well as the required response actions needed to minimize the hazards. For example, identifying and eliminating sources of ignition in flammable liquids storage areas can minimize the potential for secondary fire following spillage of a flammable liquid.
4. Identify maximum quantities of materials that could be released under various conditions (i.e., during container handling, dispensing, fire conditions, etc.) and potential receptors (i.e., floor or sewer drains, adjacent areas, other rooms on the same air supply system, etc.).
5. Identify needed and available personal protective equipment, emergency communication devices, spill supplies, fire extinguishers, eye wash stations, emergency showers, first aid kits, and other equipment that are readily available to respond to an accident or release. Know the maximum quantity of released material for which you are adequately prepared to respond, and know when outside assistance will be needed.
6. Identify building evacuation routes. These routes should be discussed, posted, and practiced at least annually with staff.

7. Identify notification procedures for emergency responders, including campus service units that may play a role in the response (i.e., Building Systems Maintenance, EHS, Utility Services, etc.).

Small Spills

What is a small spill?

In general, a small spill meets the following parameters:

1. Adequate clean-up supplies and Personal Protective Equipment (PPE) are readily available;
2. Respiratory protection is not required to avoid over-exposure during the clean-up, and the spill is not in an unventilated or enclosed space that must be bodily entered;
3. The spilled material is not highly toxic, does not endanger people or property except by direct contact, and has good warning properties (e.g., does not deaden the senses; is detected by the senses at concentrations well below the exposure limits; and, exposure produces immediate, and reversible effects- not delayed or permanent effects);
4. The spill is not likely to spread beyond the area immediately involved; and,
5. The threat of secondary events is minimal (e.g., explosions, fires, etc.). Water reactive and air-reactive chemicals, highly flammable solvents in the presence of potential ignition sources, compressed gases, and strong oxidizing agents typically involve increased risk for secondary events.

What supplies should be available for a small spill?

At a minimum, a spill kit should be assembled of the following materials:

1. Personal Protective Equipment
 - Splash Goggles- 1 pr.
 - Faceshield- 1
 - Assortment of chemically resistant gloves
 - Protective outer garment (i.e., tychem® suit, apron, lab coat, shoe covers, etc.)
2. ***Diking Materials and Absorbents*** – Diatomaceous earth and vermiculite are relatively inexpensive and effective diking/absorbing agents. However, spill pillows and pads are easier to store and use. When selecting pads or pillows, select a “universal” type that is compatible with a broad range of chemicals.
3. ***Neutralizing Agents*** – Citric acid can be used to neutralize caustics. Soda ash can be used to neutralize acids. However, neutralization can often cause splashing, vigorous gas evolution, and become quite messy. Neutralizing agents can form salt deposits that are hard to remove from floors and other surfaces. Generally, it is more efficient and tidy to absorb acids and bases with compatible pillows or pads, or diatomaceous earth.
4. ***Disposal containers*** for spill cleanup residues and contaminated materials. Plastic pails or buckets equipped with lids are excellent choices. Heavy plastic bags can also be used. If heavy plastic bags are selected, have some duct tape handy to seal the bag after use.

5. **Equipment** – Brushes, brooms, scoops, shovels, dust pans, and other similar items may be necessary to facilitate remote handling of contaminated materials and absorbents.
6. **Decontamination equipment and materials** – Soap and scrub brushes will be needed for area and equipment decontamination.
7. Fire extinguisher properly classed for any potential chemical release.
8. First aid kit.
9. Hazardous Material Collection Tags.
10. Special spill control materials as recommended in the MSDS or as required to prevent releases from spreading to likely receptors (i.e., impervious drain blocks for floor drains, etc.).

What are the appropriate response steps for a small spill?

1. Take action to stop the release (i.e., upright containers that have been knocked over, close valves, etc.) to the extent that such actions are safe, feasible, and quick.
2. Call 9-911 if the spill involves fire or injury.
3. Alert others in the immediate vicinity. Ensure that extraneous personnel remain at a safe distance until the spill is completely cleaned-up. One of these people can serve as a “monitor” and alert emergency response personnel if the spill unexpectedly results in an emergency. If others are available they can assist in notifying supervisors and/or other appropriate individuals.
4. Evaluate risks to health, property, or the environment and confirm the “small” nature of the spill.
5. Contain the spill. This may involve increasing ventilation via fume hoods or windows if a volatile material is involved, sealing floor drains, closing doors, inactivating potential sources of ignition, etc.
6. Don appropriate personal protective equipment.
7. Control the spread of liquids. If the material is a liquid and it can spread, form a dike around the perimeter of the spill with absorbent.
8. Absorb the liquid on the interior of the dike with additional granular absorbent, spill pillows, or absorbent pads.
9. Place all absorbents into a heavy plastic bucket or bag and seal the container. Scoops, shovels, tongs, and other remote handling devices work well.
10. If the spill involves solid granular or powdered material, take care not to create dusts while scooping the material into a sealable container. So long as the material is not water-reactive, it can be misted with water to prevent dust formation.
11. Decontaminate the spill area and non-disposable equipment by thoroughly cleaning with soap and water.
12. Thoroughly wash hands, arms, face, and other potentially contaminated body parts.
13. Tag the spill residues, absorbents, and disposable equipment for collection by EHS.
14. Notify EHS of the spill so follow-up action can be initiated as necessary.

Large Spills

What is a large spill?

A large spill involves situations that do not qualify under the small spill criteria described above. For example, the spill involves quantities that exceed spill kit supplies; the spill involves materials and/or quantities that pose an inhalation hazard requiring respiratory protection to avoid over-exposure; or the chemical has poor warning properties and/or presents risk of chronic health effects.

What are the appropriate response steps for a large spill?

In the case of imminent danger to health, property, or the environment, initiate the following actions:

1. **For indoor releases/spills:** Leave the area and notify emergency response personnel.
 - If the spill **presents an imminent danger to health or property**, pull the fire alarm to initiate building evacuation.
 - If the spill is **large but does not pose an imminent danger**, notify EHS during normal business hours and the campus operator at other times. To the extent possible and safe without risking exposure, contain or control the spread of the spill.

For outdoor releases/spills: Notify EHS during normal business hours and the campus operator at other times. If possible to do so safely (without risk of over-exposure), take action to stop the release (i.e., shutting valves, etc.) and prevent or minimize releases to storm sewers. Do not initiate evacuation from adjacent buildings unless otherwise advised by emergency responders.

2. Render appropriate first aid. Thoroughly wash exposed areas of the skin with soap and water.
3. Remain at a safe location near the scene and present yourself to emergency response personnel to provide information: name of the chemical released, amount, location, potential hazards of the chemical and possible secondary hazards, potential receptors, etc.