CHEMICAL SPILL CLEANUP GUIDELINES

Questions arise as to what constitute a large spill which would require outside assistance, and the type and size of a spills which could be cleaned safely by laboratory personnel, and what are the limitations of the chemical spill kits commonly purchased for laboratories.

The following guidelines are offered to help you decide if you should clean up a chemical spill and outline procedures that must be followed during such events.

Depending on the toxicity, flammability and volatility of the spilled material as well as the characteristic of the area where it is spilled (i.e. Oxygen deficient atmospheres with less than <19.5 % Oxygen, lack of, or inadequate ventilation and in confined spaces); a "large spill" can be as small as few milliliters and often personnel have to make professional judgment as to the severity of the spill and whether they should clean it up or not

I. WHO CLEANS UP CHEMICAL SPILLS

A. You clean up the spill if:

It does not involve injury, the quantity spilled is less than half a quart of a moderately toxic chemical, and you have the proper training and proper protective equipment (spill clean up kit) to do the cleanup.

B. You should request professional assistance/outside help for

Chemical spill situations for which you have questions or doubts about your ability to clean up the spill, you should follow proper emergency response procedure,

- Call *Environmental Health and Safety-Office 726-7273 for further evaluation and assistance, or* for spills that are larger than what you can handle.
- Call 911 for situations that involve injuries, fires, explosions, a highly toxic compound, and/or potentially life threatening or IDLH (Immediately Dangerous to Life and Health) situations.

Chemical spills that are too large to clean up internally, the Chemical Assessment Team from the Duluth Fire Department will be called in for the initial response. A private contractor may be called in to finish the cleanup if necessary.

C. Preplanning For Response to Chemical Spill Emergencies

1. Attend the Emergency Preparedness and Response Training to gain more insight about types and severity of spills.
2. Designate a Department Emergency Coordinators:

   Two people must be designated in your lab or service area to be on-site emergency coordinator and back-up emergency coordinator (example: the department RSO and the laboratory or service area lead worker). These Individuals should be familiar with and know what hazard exist in your area, how to implement this spill response plan (Contingency Plan) for the area and

would act as advisors to Police, Fire Department and to Environmental Health and Safety personnel during an emergency.

3. Post Emergency Telephone Numbers:

   A form containing the names and phone numbers of the institution's emergency response personnel must be posted in the work area, preferably by the telephone. The form may also include the following:

   - Name and phone number of the on-site coordinator, and his/her alternate
   - Emergency telephone numbers: 911, 726-6764, or 726-7273
   - Emergency hospital phone number.
   - Emergency Coordinator/RSO phone number
   - Location of the fire extinguishers.
   - Location of the spill control equipment.

   A ready to use form maybe downloaded from <http://www.d.umn.edu/ehso/post/>.

4. Employee Training

   All employees should be trained on spill procedures when they are first hired and yearly thereafter. Document the training and have employee and supervisor sign the documentation form to certify that the training was given. Keep these certification forms with your departmental employee training records. The following online "Emergency Preparedness and Response Training" Module maybe used.

5. Maps and Chemical Inventories

   Maps indicating emergency exit routes for each building are posted by the elevator in each floor to aid you in locating emergency equipment, and in leaving the building during emergency evacuations.

   - Keep accurate and up-to-date inventories of all chemicals in your laboratory or service area and send an electronic copy of the inventory to Environmental Health and Safety Office on a regular basis or whenever the new chemicals of concerns are acquire.
   - Keep copies of Material Safety Data Sheets (MSDS) in your lab for chemicals being used in the lab for easy access, to consult prior to working and in case an emergency occurs. MSDS could aid you provide advance warning to emergency response personnel of all possible hazards in the room/lab.

5. NFPA "704" Sign:

Storage Areas or buildings with significant amount of chemicals are posted, or labeled with a National Fire Protection Association (NFPA) "704" sign to alert fire fighters and emergency response personnel to the danger within that particular room or building. Contact Environmental Health and Safety for Assistance

6. Spill Kit and Personal Protective equipment:

Purchase a Chemical Spill Kit from the University Stores, or purchase spill cleanup material and personal protective equipment (PPE) (e.g. respirators chemical resistant suits and gloves, safety goggles, etc.) for your laboratory. Know what the limitations of the personal protective equipment are.

Respirator use is regulated by the Occupational Health and Safety Administration (OSHA). All who intend to use a respirator must enroll and comply with the University of Minnesota Respiratory Protection Program [Program1], or [Program2]

If you have any questions regarding respirator use, or for guidance in choosing PPE, call EHS-Office at 726-7273.

II. HAZARDOUS CHEMICAL SPILL CLEANUP GUIDELINES

Depending on the situation, Emergencies will be handled as follow:

A. Rescue

Prior to leaving the site during an emergency, attend to victims (e.g. assist a chemical spill victim removing cloths, take a shower, wash eyes, or smother a fire, etc.), move the victim to the outside. Make sure you are not endangering your life.
(Just as you are not to reenter a burning building, **Do Not** go back into an area where a chemical spill has occurred if you are not properly protected. In many cases, rescuers not wearing proper protective equipment have been overcome by toxic or asphyxiating fumes trying to rescue other victims and succumb as a result. **Do not make this mistake.**

B. Evacuate

As you leave area involved in a chemical spill:

- Alert neighbors.
- Activate fire alarm at pull station in case of fire or explosion.
- Evacuate personnel from the spill area.
- Direct personnel to nearest fire exit.
- Do not use elevators.

- Follow procedure outlined in your Building Emergency Evacuation (BEEP) Plan.

C. Confine/Secure

In the event of a fire, a hazardous material spill, or an explosion, the affected area needs to be confined in order to insure that fires do not occur, recur or spread to neighboring storage rooms, labs or service areas, and to prevent the spread of contamination. The following steps need to be implemented **if they do not endanger your life or health.**

- Isolate contaminated area: Close all lab and hallway fire doors.
- Post laboratory and hallway doors with a warning sign **(CAUTION: Chemical Spill).**
- Turn off/unplug all electrical equipment and any sources of sparks or fires.
- If fumes/vapors are spreading into adjacent laboratories, hallways or the rest of building, call Facilities Management at **726-8262** and request they shut off ventilation system.

C. Report the incident (see page1 above)

Always report the incident from a safe location.

Call 911 for the following types of emergency situations:

- Spills or any other emergency situation involving injuries that require medical treatment.
- Spills involving fire or explosion hazard.
- Spills which are life threatening (IDLH situations)
- Spills of highly toxic chemicals and for
- All chemical spills that occurs on weekends, holidays or after hours (4:30 PM -7:45 AM).

Call Environmental Health and Safety-Office at (218) 726-7273 or 726-6764 for the following types of emergencies:

- Spills of one quart of a chemical or more, or any quantity of a highly reactive or toxic material.
- Spills of unknown chemicals.
- Spills you do not have the proper training or protective equipment to do the cleanup.
- Spills for which you have any questions or doubts about your ability to do the cleanup.

When you report an emergency to 911 or EHS-Office., you will be requested to provide the following information:

- Your name, location and phone number.
- Location of the incident: building, floor and room number.
- Time and type of incident.
- Name and quantity of chemicals involved, to the extent known.
- The extent of injuries if any.
- Type of hazard to health or the environment including (particularly: flammable, oxidizer, highly reactive and air-born toxic or irritant materials), radioactive materials, biohazards)
- The safest route to approach the spill.

E. CLEANUP

Based on the spill situations described in page 1, sections **I**.A and **I.**B, decide who will do the cleanup. If you decide to clean up the spill, then proper response procedure as described in this document and in the accompanying training

In General

- Notify your Emergency Coordinator and your neighbors for back up
- Notify EHS-Office
- Review MSDS and request additional advice from EHSO
- Locate spill kit and other needed material.
- Choose appropriate personal protection according to information given in MSDS.
- Wear chemical resistant gloves, safety glasses and/or face shield.
- Wear coverall and/or apron
- Use appropriate respirator if permitted to do so.
- Work in a buddy system (i.e. Never work alone, work in pair).

General spill cleanup procedure

- Apply the spill absorbing or neutralizing material according to the hazardous characteristics of the spilled substance.
- Work inward from the spill perimeter until the spilled material is covered.
- Scrape and sweep contaminated absorbing material into a dust pan, place in a sealed container.
- Wet mop contaminated area if spilled material is not water sensitive.
- Label container with a hazardous waste label as to its content (i.e. spill cleanup material & spilled compound name)
- Arrange with EHS-Office for pick up and appropriate disposal.

F. Spills Requiring Special Handling

1. Mercury

Mercury spills, commonly from broken thermometers can result in a large number of very small particles that are difficult to clean up. Small particles of mercury have an increased rate of vaporization, due to higher ratio of surface area to volume, and this can cause greater contamination of the air than can be safely handled by normal ventilation. The safe exposure limit can be exceeded by a single broken thermometer in small unventilated rooms or in a high temperature environment (e.g. ovens).

Avoid the use of mercury equipment, use non-mercury containing thermometers and equipment. Check out our Mercury thermometer exchange program:
<http://www.d.umn.edu/ehso/waste_management/mtep.html>

For small spills of mercury:

- Wear gloves and booties, to prevent skin contact and absorption,
- Use aspirator bulbs, suction devices.
- Never use vacuum cleaners.
- After removal of visible mercury particles, Mop contaminated area in a circular motion with mercury decontaminating solution of HgX in water, (available from University stores).
- All mercury and mercury contaminated material should be placed immediately in an unbreakable plastic container and sealed tightly.
- Fill out proper waste disposal forms and arrange with EHS-Office for pick up and proper disposal.

Call EHS-Office for:

- Larger spills.
- Spills in carpeted rooms.
- Spills in small non-vented rooms (confined space).
- Spills in ovens or heated areas apparatus.

G. Decontaminate (DECON)

Decontaminating is the physical and/or the chemical process of removing, harmful substances from equipment, personal protective clothing. It reduces or prevents the spread of contamination to unaffected areas.

1. TOOLS

Tools and supplies used to clean up a spill must be decontaminated prior to storage if they are not disposable. Disposable tools and clothing are

considered hazardous when contaminated and must be disposed properly as hazardous waste.

- Drop reusable tools in a water-detergent or neutralizing solution as required, before removing PPE
- Allow for few minutes then remove, wash and rinse tools with running water.
- Place in a sealed container for future use.

Please note: Only approved individuals may use a respirator, as respirator use does require prior medical approval and proper fit testing, and training. Also respirators do have limitations, and cartridges are certified only for certain types of chemicals and are only effective in atmospheres that contains at most 10 times the Threshold Limit Value (TLV) of the spilled material, and can be used in atmospheres that are **NOT DEFICIENT** in oxygen (below 19.5 percent oxygen).

TLV (Threshold Limit Values) are found on the Material Safety Data (MSDS), and are also listed in the Laboratory Safety Plan.

Be aware of the fact that the Lower Explosive Limit (LEL) of a chemical may be reached at the surface of the spill even though in a well ventilated areas. Use sparks less tools, and avoid sources of ignition when doing the cleanup; the protective equipment will not protect you from flash fires or explosions.