UNMC CHEMICAL SPILL PLAN

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University of Nebraska Medical Center

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University of Nebraska Medical Center (UNMC)
Chemical Spill Response Plan

Chemical spills can and do occur despite our best intentions. Depending on the chemical properties and quantity of the spilled chemical, it can create potentially dangerous situations. Therefore, it is important that UNMC personnel are prepared for chemical spills. For more information on this plan or if you have questions, contact the UNMC Environmental Health and Safety Office at 402-559-6356.

Basis for the Chemical Spill Response Plan

Chemicals are used throughout the UNMC Campus. Despite efforts to be careful when handling chemicals, laboratory, environmental service, and facilities employees sometimes spill chemicals. Chemical spills can create health and safety hazards resultingin death, injury, property damage and environmental contamination, all of which can leadto regulatory violations and fines. The Environmental Protection Agency (EPA) in Title 40of the Code of Federal Regulations (CFR) requires that all chemical spills be evaluated and reported if the quantity threshold is reached.

Chemical spill response at UNMC must be a shared responsibility among personnel who use chemicals, Principal Investigators, Department Heads, Security/Public Safety, the UNMCIncident Commander, Environmental Health and Safety, Facilities, Environmental Services and in some cases, independent contractors.

This comprehensive chemical spill response plan assigns responsibilities and also offers guidance on minimizing chemical spills, preparing for chemical spills and finally, the clean-up of chemical spills. Following the Chemical Spill Response Plan will help UNMC to protect human health, facilities, and the environment.

Responsibilities

UNMC Personnel who use chemicals

In most cases personnel who are working with or occupy areas that store hazardous chemicals, will be reporting and potentially cleaning up chemical spills. They need to know:

1. The hazard of the chemical they are working with.
2. Which chemicals/quantities they can safely clean.
3. The proper personal protective equipment (PPE) to use.
4. How to report chemical spills.

They should receive this information from their principal investigator (PI) or departmenthead for which they work.

UNMC Principal Investigators (PIs)

UNMC Principal Investigators shall be responsible for:

The safe operation of their laboratories and chemical handling including:

1. Maintain a laboratory emergency response plan.
2. Updating laboratory safety/NFPA signs whenever information changes
3. Maintaining a list of chemicals and their maximum quantity.
4. Maintaining Safety Data Sheets (SDS) for each chemical.
5. Ensuring that 24/7 phone numbers for all areas where chemicals are stored or used is on file with Environmental Health and Safety.
6. The preparation for and clean-up of chemical spills
7. Providing spill control material, personal protective equipment (PPE) to designated laboratory personnel
8. Training on how to properly clean up spilled chemicals.
9. Providing UNMC EHS and UNMC Security/Public Safety with names and telephone numbersof laboratory personnel who can be contacted 24/7 to provide specific informationabout chemicals in their laboratory.
10. Updating the list of chemicals and maximum quantities of chemicals in their laboratory on a yearly basis.

Following the above will allow for the safe handling of chemical spills, provide guidance on chemical spill cleanups, and will ensure compliance with Federal regulations. In the event that outside contractors are needed to cleanup a spill in their laboratory, the PI's department may be financially responsible and may be required to provide a cost center to cover the costs.

UNMC Departments Heads

Some areas within the UNMC campus are under the control of a department versus one person (e.g. Comparative Medicine, Facilities). UNMC Department Heads shall be responsible for:

The safe operation of their areas and chemical handling including:

1. The preparation for and clean-up of chemical spills.
2. Providing spill control material, personal protective equipment (PPE) to designated personnel
3. Training employees on how to properly clean up spilled chemicals.
4. Providing UNMC EHS and Security/Public Safety with names and telephone numbersof personnel who can be contacted 24/7 to provide specific information about chemicals in their areas.
5. Updating the list of chemicals and maximum quantities of chemicals in their laboratory on a yearly basis.

Following the above will allow for the safe handling of chemical spills, provide guidance on chemical spill cleanups, and will ensure compliance with Federal regulations. In the event that outside contractors are needed to cleanup a spill in their area, the

department may be financially responsible and may be required to provide a cost center to cover the costs.

UNMC Security/Public Safety

UNMC Security/Public Safety shall be responsible for:

1. Taking spill calls at 402-559-5111 for controlled chemical spills.
2. Taking spill calls at 402-559-5555 for uncontrolled chemical spills.
3. Contacting OFD and on-call UNMC Incident Commander for all uncontrolled spills.
4. Contacting the appropriate (depending on location of the spill) 24/7 on-call PI, Department Head or designee.
5. Contacting the UNMC EHS on-call spill response contact for all chemical spills.
6. Responding to all spills requiring assistance to secure the area, help with evacuations if necessary and assist outside personnel responding to the event.
7. Cordon off spill areas and buildings until proper spill determinations are made and the spill is properly mitigated and cleaned.

UNMC Incident Commander.

The 24/7 on-call UNMC Incident Commander shall be responsible for:

1. Activating the UNMC Disaster Response Plan if necessary.
2. Acting as the on-site/on-scene incident commander unless otherwise directed by an outside authority (e.g. Omaha Fire Chief) for uncontrolled spills.
3. Approving the shutdown of all affected spill area operations.
4. Making the decision to contact the retained independent spill remediation contractor to provide chemical spill clean-up.
5. Making the decision to contact the retained independent industrial hygiene contractor to provide monitoring and guidance to allow for the safe re-entry of UNMC personnel.

UNMC Environmental Health and Safety (EHS)

EHS shall be responsible for:

1. Ensuring all laboratory and area NFPA signs are updated
2. Ensuring all PI's and departments maintain a list of chemicals in their area.
3. Ensuring that areas maintain Safety Data Sheets (SDS) for each chemical.
4. Ensuring that 24/7 phone numbers for all areas where chemicals are stored or used (PI, Department Head and/or designee) are on file and that Public Safety has access to the information.
5. Maintaining the contracts for independent spill remediation and industrial hygiene contractors.
6. Reviewing the Safety Data Sheet (SDS) and providing consultation to UNMC personnel working with chemicals, to determine the appropriate actions necessary to mitigate a controlled spill.
7. Maintaining a 24/7 on-call spill response contact person to provide guidance on controlled spill clean-ups, and assist in mitigating controlled spills, requiring assistance. Environmental Health and Safety can only assist on spills requiring

level C or Level D personal protective equipment (PPE) (air-purifying respirators and Tyvek suits).

8. Contacting the retained independent spill remediation contractor to provide chemical spill clean-up, at the request of the UNMC Incident Commander.
9. Contacting the retained independent industrial hygiene contractor to provide monitoring and guidance to allow for the safe re-entry of UNMC personnel, at the request of the UNMC Incident Commander.
10. Consulting with and providing assistance to OFD and independent contractors (if called), on uncontrolled chemical spill clean-up and remediation efforts, requiring response in level A or B PPE which requires self-contained breathing apparatus (SCBA).
11. Consulting with the UNMC Incident Commander, the primary investigator and industrial hygiene experts to allow reoccupation of the affected area.
12. Performing a hazardous waste determination on all spill residue.
13. Ensuring that spill residue identified as a hazardous waste is transported to a hazardous waste disposal facility in accordance with the EPA and DOT requirements.
14. Determining if any spill is reportable and make those reports to federal and state entities
15. Maintaining 24/7 on-call Emergency Coordinators required by the EPA, to evaluate chemical spills originating in the UNMC Hazardous Waste Accumulation Building (WAB).
16. Notifying the UNMC Compliance Officer to resolve any improper chemical spill clean-up or non-compliance issues.

UNMC Compliance Officer

1. Assist UNMC EHS to resolve improper spill clean-up or non-compliance issues.

UNMC Facilities

UNMC Facilities shall be responsible for:

1. Cutting electricity, gas or water supplies to affected areas if necessary and safe to do so.
2. Increasing ventilation if necessary.
3. Providing assistance to the incident commander as needed.

Omaha Fire Department/Hazmat (OFD).

The Omaha Fire Department's Hazardous Materials team has agreed to respond to chemical spills as follows and with the stated provisions:

1. OFD will be called if the spill involves fire or explosion, injured personnel or for spills larger or more dangerous than EHS can handle.

2. OFD will consult, if needed, with personnel responsible for the area to determinewhich chemical has spilled and other potential hazards prior to entering the laboratory.
3. The OFD can respond to spills requiring level A and B PPE (supplied air).
4. The OFD will respond to spills of unknown chemicals but reserve the right not toenter the area unless further identification is provided or determined.
5. Further unknown identification can be provided by Omaha Hazmat but may belimited.
6. Further identification will be supplied by outside contractor
7. OFD will stop further chemical spillage and contain spilled material however, further chemical clean-up and disposal is the requirement of UNMC or an outsidecontractor.

Spill Remediation Contractor

UNMC has contracted with an outside contractor to provide 24-hour emergency response clean-up and/or remediation of chemical spills that are beyond the scope of OFD services and EHS's limited capabilities. The PI or Department responsible forthe spill is financially responsible for paying the cost to use the spill remediation contractor. UNMC EHS will assist the spill remediation contractor in any way that they can and will coordinate the disposal of spill debris.

Industrial Hygiene Contractor

UNMC EHS has contracted with an outside contractor to provide industrial hygiene services. This may be required if there is concern about safe reentry. The PI or Department responsible for the spill is financially responsible for paying the cost to use the industrial hygiene contractor. UNMC EHS will assist the Industrial Hygiene Contractor in any way that theycan.

UNMC Environmental Services

The UNMC Environmental Services contractor shall be responsible for:

1. Cleaning, mopping and re-waxing (if necessary) floors in spill areas after the chemical spill has been cleaned up and it has been determined to be safe toenter the area.
2. Assisting with the clean-up of non-hazardous spills.
3. Removing trash generated from a spill provided it has been determined to benonhazardous.

Procedures

To ensure the safety of UNMC personnel that work with and will potentially clean-up chemical spills, to ensure compliance with federal regulations, and to minimize the chances of having to hire expensive outside contractors, PIs, department chairs and laboratory personnel shall comply with these steps.

A. Minimizing the potential for a spill

1. Plan experiments and work carefully and only order/use the minimum amountof chemical possible.
2. Get rid of excess chemicals that are no longer being used. Contact EHS forguidelines on chemical disposal
3. Train all personnel working with chemicals on the proper use and hazards ofthe chemicals they will be using.
4. Keep bench tops, hoods and walkways clear to prevent potential spills.

B. Preparing for a chemical spill

1. Review Safety Data Sheets (SDS) of the chemicals being used to identify physical and health hazards and think about material needed to respond to aspill.
2. Consider the amount of spilled chemical that you would be comfortable cleaning up and have the appropriate supplies to allow it. See Attachment 1:Spill Cleanup Reference
3. Identify which procedures would most likely have the highest risk for spillsand try to minimize or eliminate those risks.
4. Minimize ignition sources especially when using flammable material, and usetoxic materials in a fume hood.
5. Identify and locate PPE, spill clean-up supplies, fire extinguishers, eye wash stations, emergency showers, first aid kits and other equipment that would beneeded in the event of a chemical spill.
6. Determine the maximum amount of spilled material you are prepared for andwould be capable of cleaning, and know when outside assistance would be needed. This can depend on quantities and/or toxicities.
7. Train all personnel working with chemicals on the proper spill cleanup.
8. Identify evacuation routes and muster points.
9. Identify notification procedures for outside assistance. In most cases this will be to call UNMC Security/Public Safety at 402-559-5111 (small controllable spill) or 402-559-5555 if the spill involves explosion, fire or injured personnel.
10. Identify procedures for documenting spills and near misses, including thosethat you are able to clean yourselves. Incident, accident and near-miss reporting form

C. Chemical Spill Kits

1. PI's or laboratory personnel should purchase or make a chemical spill kit. Many different spill kits are available in eSHOP and should be chosen

basedon the types of chemicals that are being used. At a minimum the spill kit should contain:

- Safety glasses, Splash goggles or Face shield depending on chemicals inlab
- Chemical resistant gloves (will depend on the chemicals you work with)
- Protective outer garments (lab coat, Tyvek suit, shoe covers)
- Chemically compatible spill pads, and/or absorbent material and/orneutralizers.
- Bags and zip ties for holding spill debris

2. Spill kits should be inspected at least yearly to determine viability of supplies
3. Store spill kits in an accessible area and make sure all lab personnel knowthe location and contents of the kit.

D. Cleaning up a Chemical Spill

The goal is to minimize the potential for spills and to prepare for chemical spills. Chemical spill kits should be available in laboratory areas where chemicals are used. Labs should also have a copy of the Chemical Spill Emergency Response posted in their lab.

There are three types of spill responses:

Controlled Spills (Controlled spills are incidental releases that can be cleaned up by personnel in the area of the spill). Per OSHA, *an incidental release is a release of a hazardous substance which does not pose a significant safety or health hazard to employees in the immediate vicinity or to the employee cleaningit up, nor does it have the potential to become an emergency within a short time frame. Incidental releases are limited in quantity, exposure potential, or toxicity and present minor safety or health hazards to employees in the immediate work area or those assigned to clean them up. An incidental spill may be safely cleaned up by employees who are familiar with the hazards of the chemicals withwhich they are working.*

The properties of hazardous substances, such as toxicity, volatility, flammability, explosiveness, corrosiveness, etc., as well as the particular circumstances of therelease itself, such as quantity, confined space considerations, ventilation, etc., will have an impact on what employees can handle safely and what procedures should be followed. Additionally, there are other factors that may mitigate the hazards associated with a release and its remediation, such as the knowledge of

the employee in the immediate work area, the response and personal protective equipment (PPE) at hand, and the pre-established standard operating procedures for responding to releases of hazardous substances. There are some engineering control measures that will mitigate the release that employees can activate to assist them in controlling and stopping the release.

These considerations (properties of the hazardous substance, the circumstances of the release, and the mitigating factors in the work area) combine to define the distinction between incidental releases and releases that require an emergency response. The distinction is facility-specific and is a function of the (laboratory) emergency response plan.

1. These are spills of chemicals that are not reasonably expected to be a threat to human health or the environment, the properties are well known, and have been previously determined to be safely cleaned by laboratory personnel.
2. Evacuate other personnel from the area.
3. Review the SDS for guidance.
4. Don the appropriate PPE.
5. Use the spill pads or absorbents to contain the spill.
6. Containerize the spilled material, fill out a chemical collection tag, and contact chemical safety. See Chemical Disposal Fact Sheet.
7. Complete the UNMC Incident Report Form at: https://www.unmc.edu/ehs/safety/IncidentReportForm.pdf

Controlled Spills, requiring assistance (controlled spills that are beyond the capabilities of personnel in the area of the spill)

1. These are spills of chemicals that are not reasonably expected to pose a threat to human health or the environment, the properties are well known, but they are beyond the capabilities of the UNMC personnel who use the chemicals.
2. Evacuate other personnel from the area.
3. Contact UNMC EHS at 402-559-6356 (during office hours, 7:00 a.m. - 4:30 p.m.), or UNMC Security/Public Safety at 402-559-5111 (after hours) for assistance.
4. Provide the SDS for guidance.
5. The UNMC EHS Office will assist and containerize the spilled material and clean up the area if they can safely do so utilizing level C PPE.
6. Lab personnel will fill out a chemical collection tag, and contact EHS. See Chemical Disposal Fact Sheet.
7. Complete the UNMC Incident Report Form at: https://www.unmc.edu/ehs/safety/IncidentReportForm.pdf

Uncontrolled Spill (Spill may pose a threat to human health and/or the environment and personnel in the vicinity are not able to contain the spill).

These are spills of chemicals that involve personnel injury, fire or explosion and can pose a threat to human health, the environment or UNMC property. It also includes large uncontrollable chemical spills, unknown chemical spills that are reasonably expected to cause serious injury or damage, or spills of chemicals that are water reactive, pyrophoric, shock sensitive, temperature sensitive or highly toxic materials and cannot be safely cleaned by laboratory personnel.

1. Call UNMC Security/Public Safety at 402-559-5555. Stay on the line and be prepared to provide:
   - Your name
   - Your phone number
   - Your location
   - The name and quantity of chemical spilled
   - A description of the incident.

2. UNMC Security/Public Safety will immediately contact and provide this information to:
   - 911
   - UNMC Incident Commander
   - PI or Department designee spill response contact who is responsible for the area.
   - UNMC EHS 24-hour spill response personnel.

3. The OFD, UNMC Incident Commander, UNMC EHS spill response personnel, and the UNMC personnel whose area is affected will assess the situation. The OFD will mitigate and clean up the spill if they can safely do so. The UNMC EHS will also assist with remediation and/or decontamination if they can safely do so in Level C PPE
4. If at some point it is determined that spill is a known material and can be safely cleaned up in Level C PPE, UNMC EHS personnel will don the appropriate PPE, clean the spill and remove the debris.
5. If the OFD and/or UNMC EHS cannot clean up the spill, then the UNMC Incident Commander will contact the spill remediation contractor to clean up the spill.
6. UNMC Incident Commander will consult with appropriate personnel to approve area reentry and operational limitations. If professional guidance is required for admittance to the area and/or analytical determinations are required, the UNMC Incident Commander will call the industrial hygiene contractor.
7. UNMC EHS will assist with the disposal of the spilled material, once properly packaged.
8. UNMC EHS will assess and implement all required city, state and federal spill notifications.

E. Unknown Chemical Spills

Spills of unknown material that is reasonable expected to cause serious injury or damage will be treated as an uncontrolled spill. It is important for lab personnel to label all containers of chemicals to minimize the potential expenses associated with cleaning up a spill of unknown material.

F. Mercury Spills

In the event of a mercury spill, cordon off the area; keep personnel away and Contact UNMC EHS 402-559-6356 during office hours, 7:00 a.m.- 4:30 p.m., or call UNMC Security/Public Safety at 402-559-5111 after hours.

G. Radioactive Material Spills

For radioactive spills, please refer to section B4 of the UNMC Radiation Safety Manual.

H. Biological/Infectious Agent Spills

For biological/infectious agent spills please see UNMC Institutional Biosafety Committee, Policy IBC-04: Biological Spill Clean-Up IBC Policies

Attachment 1: Spill Cleanup Reference

Chemical Spilled	Cleanup
Acids, organic	Apply sodium bicarbonate or acid spill neutralizer. Absorb with spill pad.
Acids, inorganic	Apply sodium bicarbonate/calcium oxide or sodium carbonate/calcium oxide or acid spill neutralizer and absorb with spill pad. **NOTE:** Hydrofluoric acid is an exception to this general practice. See below.
Acid chlorides	Do not use water. Absorb with spill pad or acid spill neutralizer.
Aldehydes	Absorb with spill pad.
Aliphatic amines	Apply sodium bisulfite. Absorb with a spill pad.
Aromatic amines	Absorb with spill pad. Avoid skin contact or inhalation
Aromatic halogenated amines	Absorb with spill pad. Avoid skin contact or inhalation.
Azides (potential explosives)	Absorb with spill pad. Decontaminate with 10% ceric ammonium nitrate solution
Bases (caustic alkalis)	Neutralize with acid or commercial chemical neutralizers and absorb with spill pad
Chlorohydrins	Absorb with spill pad. Avoid skin contact or inhalation.
Cyanides	Wet or mist solids before sweeping, or use a HEPA filter vacuum to collect the solids. Absorb liquids with spill pad.
Halides, organic or inorganic	Apply sodium bicarbonate. Scoop up or absorb with a spill pad
Halogenated hydrocarbons	Absorb with spill pad.
Hydrofluoric acid	Absorb with calcium carbonate (or calcium oxide) rather than sodium bicarbonate. The use of sodium bicarbonate will lead to the formation of sodium fluoride, which is considerably more toxic than calcium fluoride. Be careful in the choice of spill pads used to absorb the acid. Certain pads contain silicates that are incompatible with hydrofluoric acid.
Inorganic salt solutions	Absorb with spill pad.
Mercaptans/organic sulfides	Neutralize with calcium hypochlorite solution. Absorb with spill pad.
Nitriles	Sweep up solids. Absorb liquids with spill pad.
Nitro compounds, organic nitros	Absorb with spill pad. Avoid skin contact or inhalation.
Oxidizing agents	Apply sodium bisulfite and absorb with spill pad.
Peroxides (react violently with water)	Absorb with spill pad.
Phosphates, organic and related	Absorb with spill pad.
Reducing substance	Apply sodium bicarbonate and absorb with spill pad.