TITLE: **Laboratory Emergency Plan**

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PURPOSE: To provide uniform procedures to be followed in the event of an emergency, such as hazardous material (biological, chemical and radioactive materials) spills, personnel contamination, or power failures, occurs in laboratories.

SCOPE: University wide.

POLICY: All laboratory staff who work with hazardous materials must be trained to safely respond to spills. Only staff trained in spill response shall be allowed to clean-up spills. Laboratory staff have the responsibility, training and equipment to clean-up an incidental spill. All hazardous material releases that meet the definition of an emergency response are to be handled by trained hazardous material responders. Laboratory staff who discover a hazardous material spill that is not an incidental spill must call 911 (campus phone, 631-632-3333 cell phone) to report the emergency and request assistance from Environmental Health and Safety.

DEFINITIONS:

Decontamination: The removal of hazardous substances from people and their equipment to the extent necessary to preclude the occurrence of foreseeable adverse health effects.

Emergency Response ("Major Spill"): A response effort by employees from outside the immediate release area or by other designated responders (i.e., mutual aid groups, local fire departments, etc.) to an occurrence which results, or is likely to result, in an uncontrolled release of a hazardous substance. (See Section VII for additional information).

First Aid: All laboratory workers are expected to provide assistance to others in the laboratory that may have become contaminated with hazardous substances. This includes assisting the contaminated person to the emergency shower and eyewash and helping them flush the contamination. This assistance does not require specialized first aid training.

First Responder Awareness Level: Individuals who are likely to witness or discover a hazardous substance release and who have been trained to initiate an emergency response sequence by notifying the proper authorities of the release. They would take no further action beyond notifying the authorities of the release.

Hazardous Substance: Any substance to which exposure results or may result in adverse effects on the health or safety of employees, including:

1. Any substance defined under section 101(14) of CERCLA;
2. Any biologic agent and other disease causing agent which after release into the

environment and upon exposure, ingestion, inhalation, or assimilation into any person, either directly from the environment or indirectly by ingestion through food chains, will or may reasonably be anticipated to cause death, disease, behavioral abnormalities, cancer, genetic mutation, physiological malfunctions (including malfunctions in reproduction) or physical deformations in such persons or their offspring.

3. Any substance listed by the U.S. Department of Transportation as hazardous materials under 49 CFR 172.101 and appendices; and
4. Hazardous waste.

Health Hazard: Includes chemicals which are carcinogens, toxic or highly toxic agents, reproductive toxins, irritants, corrosives, sensitizers, hepatotoxins, nephrotoxins, neurotoxins, agents which act on the hematopoietic system and agents which damage the lungs, skin, eyes, or mucous membranes. It also includes hazards due to temperature extremes.

IDLH or **Immediately Dangerous to Life or Health:** An atmospheric concentration of any toxic, corrosive or asphyxiant substance that poses an immediate threat to life or would interfere with an individual's ability to escape from a dangerous atmosphere.

Incidental Release ("Minor Spill"): The hazardous substance can be absorbed, neutralized, or otherwise controlled at the time of release by employees in the immediate release area, or by maintenance personnel. Responses to releases of hazardous substances where there is no potential safety or health hazard (i.e., fire, explosion, or chemical exposure) are not considered to be emergency responses and are incidental releases. See Section VII for more information.

Laboratory Staff: Laboratory employees, users, volunteers and visitors who perform multiple chemical procedures on a regular or periodic basis with containers used for reactions, transfers, and other handling of substances designed to be easily and safety manipulated by one person and protective laboratory practices and equipment are available and in common use to minimize the potential for employee exposure to hazardous chemicals. This includes laboratory technicians, instructors, researchers, graduate assistants, student aides, part-time and temporary employees. These employees must also comply with EH&S Policy 4-2 *Chemical Hygiene Plan.*

NFPA/HMIS Ratings: The NFPA label system was designed for emergency response personnel and provides a quick system to identify the relative danger (0 – 4) associated with a hazardous material (NFPA 704). This system does not provide the user with specific health hazard information. The HMIS system is similar.

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PROCEDURES:

I. Emergencies - General

For emergencies such as fires, explosions, spills or transportation accidents, the basic protocol is:

1. Rescue anyone immediately affected by the emergencies only if it does not put you at risk.
2. Notify the proper authorities:
   a. If the emergency involves a fire, use the manual pull box to activate the alarm.
   b. For other emergencies, contact University Police at 911 from any campus phone (or 631-632-3333 from a cell phone), and describe the emergency. Request the Hazardous Materials Response Team (HAZMAT) for chemical emergencies and the Radiation Protection Officer if radiological materials are involved.
3. Provide first aid to victims. This includes assisting contaminated staff with the emergency shower or eyewash station.
4. Warn others in the area about the emergency by posting a notice (see Appendix 5), and stay clear of the area. Account for all laboratory staff to ensure that no one was left behind during the evacuation.
5. Follow the directions of the Emergency Responders (i.e. Fire Department personnel, Department of Environmental Health and Safety personnel).

II. Responsibilities:

A. Supervisors, PIs, etc. must:

1. Ensure that all lab workers have appropriate spill clean up procedure training.
2. Ensure that appropriate Personal Protective Equipment (PPE) is available.
3. Ensure that appropriate spill control material is readily available for the hazardous substances used in the work area, and everyone knows how to use it (see Appendix 3 for guidelines).
4. Ensure spills are reported to EH&S.

B. Laboratory Staff must:

1. Attend training.
2. Follow appropriate work practices to prevent spills.
3. Clean up all incidental spills.
4. Notify others, begin evacuation and contact University Police and request HAZMAT for Emergency Response.
5. Seek Medical Attention for all personal contamination.
6. Properly dispose of clean-up material from any incidental response involving hazardous materials.

7. Report all minor spills to EH&S after the laboratory staff has cleaned up material.

C. Environmental Health and Safety will:

1. Provide spill control training.
2. Provide guidance on spill control equipment, including personal protective equipment (PPE).
3. Respond to calls from campus community requesting guidance with spill response.
4. Make determination on whether to handle clean up within EH&S resources or to contact external Response Team.
5. Investigate spills and recommend corrective actions to prevent reoccurrences.
6. Arrange for disposal of all spill clean-up material.

III. Training

1. All laboratory staff must be trained to clean incidental spills of hazardous materials.
2. All laboratory staff must be trained to the First Responder Awareness Level. At the end of the training, they will be able to demonstrate competency in the following areas:
   a. An understanding of what hazardous substances are, and the risks associated with them in an incident.
   b. An understanding of the potential outcomes associated with an emergency created when hazardous substances are present.
   c. The ability to recognize the presence of hazardous substances in an emergency.
   d. The ability to identify the hazardous substances, if possible.
   e. An understanding of the role of the first responder awareness individual in the employer's emergency response plan including site security and control and the U.S. Department of Transportation's Emergency Response Guidebook.
   f. The ability to realize the need for additional resources, and to make appropriate notifications to the communication center.
3. Training must be completed prior to working with hazardous materials and an annual refresher to demonstrate competency in the above areas is required.
4. Training will be provided by EH&S.

IV. Emergency Pre-Plan

Each laboratory must prepare an emergency plan and all personnel should be familiar with it. This emergency plan should include:

1. An inventory that includes the quantities and locations of all flammable, pyrophoric, oxidizing, toxic, corrosive, reactive, radioactive materials, nonionizing radiation, biological materials, and compressed and liquefied gases.
2. A list of responsible personnel who are designated and trained to be liaison personnel for the fire department or other emergency responders.
3. Action to be taken by laboratory personnel upon activation of the fire alarm. This should include instructions to turn off flames and other ignition sources, close the fume hood sash,

close all hazardous materials containers, and turn off all electrical equipment. All staff are required to exit the building when the fire alarm is activated.

4. Location of emergency equipment in the laboratory (fire extinguishers, emergency shower, eyewash, spill kit and fire blanket if available).
5. Procedures for extinguishing clothing fires (stop, drop & roll, cover face with hands and use fire blanket, do not use fire extinguisher), using emergency shower and eyewash and spill kits.
6. Primary and secondary evacuation routes to the outside of the building. The 2 closest emergency exits to the laboratory need to be identified prior to any emergency.
7. Identify an area outside of the building to meet and account for all laboratory personnel.
8. Instructions not to reenter the building until qualified Emergency Responders provide notification that it is safe to return.

See Appendix 2 for Laboratory Emergency Plan Template.

V. Spill Control Equipment

All laboratories must have spill control equipment. Commercial spill kits can be purchased or the necessary components assembled in the lab. All laboratory staff must know where the spill control equipment is kept and be instructed on how to use it. Cleanup materials must be sufficient to contain the hazard type and volume of materials being used in the laboratory. The spill control equipment must be regularly checked by the laboratory staff and restocked after use.

1. Basic Equipment
    a. Spill Warning Sign (Appendix 5)
    b. First Aid kit
        - General Contents: bandages, compresses, tape, gloves, antiseptic and burn treatments.
        - Hydrofluoric Acid use requires “antidote” gel in lab. Train all HF users. Check expiration date. Pharmascience calcium gluconate. http://cagluconate.com
    c. Absorbent pads, vermiculite, and/or kitty litter
    d. Plastic dust pan, scoop and broom
    e. Plastic bags; Hazardous Waste labels
2. Material Specific Spill Control Equipment (see Appendix 3 for more detailed information):
    a. Flammable Solvents
    b. Mercury
    c. Hydrofluoric Acid
    d. Acid/Base
    e. Formaldehyde
    f. Osmium Tetroxide
    g. Blood/Body Fluid
    h. Radioactive Material Decontamination
        - Products such as RadCon Surface Cleaner, RadCon Hand Cleaner, (VWR), Decon NoCount Surface Cleaner or Decon NoCount Hand and Skin Cleaner

(Fisher)

3. Personal Protective Equipment
    a. Gloves: gloves must be appropriate for the hazardous material that is being cleaned up.
    b. Goggles: eye protection must be appropriate for the hazardous material that is being cleaned up. Chemical splash goggles must be worn for chemical spills. A face shield may be needed and must be worn over chemical splash goggles.
    c. Respirator: only staff who have been medically cleared to wear a respirator, fit tested and trained on the use and limitations of the respiratory protection equipment (annual requirements) can wear a respirator. The respirator must be selected for the hazard and potential exposure of the spilled hazardous material. All respiratory protection use must be coordinated with EH&S. Contact EH&S for assistance and guidance.

VI. Medical Consultation

The employer (Department or Supervisor) shall provide all employees who work with hazardous chemicals an opportunity to receive medical attention, including any follow-up examinations which the examining physician determines to be necessary whenever an event takes place in the work area such as a spill, leak, explosion or other occurrence resulting in the likelihood of a hazardous exposure, the affected employee shall be provided an opportunity for a medical consultation. Such consultation shall be for the purpose of determining the need for a medical examination. All medical examinations and consultations shall be performed by or under the direct supervision of a licensed physician and shall be provided without cost to the employee, without loss of pay and at a reasonable time and place.

A. Information provided to the physician

The employer (Department or Supervisor) shall provide the following information to the physician:

1. The identity of the hazardous chemical(s) to which the employee may have been exposed;
2. A description of the conditions under which the exposure occurred including quantitative exposure data, if available; and
3. A description of the signs and symptoms of exposure that the employee is experiencing, if any.

B. Physician's written opinion

For examination or consultation required in this policy, the Department or Supervisor shall obtain a written opinion from the examining physician which shall include the following:

1. Any recommendation for further medical follow-up;
2. The results of the medical examination and any associated tests;
3. Any medical condition which may be revealed in the course of the examination which may place the employee at increased risk as a result of exposure to a hazardous workplace; and

4. A statement that the employee has been informed by the physician of the results of the consultation or medical examination and any medical condition that may require further examination or treatment.
5. The written opinion shall not reveal specific findings of diagnoses unrelated to occupational exposure.

This written opinion must be made part of the employee's official personnel file and be retained for at least the duration of employment plus thirty (30) years (29 CFR 1910.1020 *Access to Employee Exposure and Medical Records*).

VII. Determination of Major vs. Minor Spill

To determine whether a spill is major (emergency response with clean up by outside staff) or minor (incidental release with clean up by lab staff), you need to know (1) the hazard(s) posed by the spilled chemical and (2) the spill's potential impact. Both these factors are, in large part, determined by the spill's size. The following information will help you determine whether you have a minor spill and can be cleaned up by the lab staff:

- the type of chemical(s) spilled – are there any other hazards besides the chemical (biological or radioactive)?
- the amount,
- the hazardous characteristics of the spilled chemical(s) – is it a solid, powder, liquid or gas? Is it flammable, corrosive or toxic?
- the location,
- the proper method for cleaning up the spill,
- the personal protective equipment available, and
- the training of the laboratory's personnel.
- A chemical spill is not a health risk if it has a low toxicity (especially if it is not volatile or a dust), is not highly corrosive, and is not a strong oxidizer. Such spills may be considered "minor" only if physical damage or environmental factors are absent.
- If the spilled chemical's toxicity is unknown, treat the spill like a potential human health hazard by avoiding exposure and seeking outside assistance.

Factors that may magnify a spill's impact and require emergency response (major spill) are:

- the possibility that hazardous vapors or dusts might enter the building's ventilation system and be distributed to other areas;
- the possibility that spilled liquids might flow into other areas, thus expanding the threat of harm, such as reaching ignition sources, exposing other people, damaging delicate equipment;
- the presence of incompatible chemicals;
- the proximity of classrooms or offices containing people who could be harmed by the spill's consequences; and
- spills in sinks that might be connected to other sinks through the plumbing system.

A Major Spill is one in which the following occurs:

1. The response comes from outside the immediate release area.
2. The release requires evacuation of employees in the area.
3. The release poses, or has the potential to pose, conditions that are immediately dangerous to life and health (IDLH).
4. The release poses a serous threat of fire or explosion (exceeds or has the potential to exceed the lower explosive limit or lower flammable limit).
5. The release requires immediate attention because of imminent danger.
6. The release may cause high levels of exposure to toxic substances.
7. There is uncertainty that the employee in the work area can handle the severity of the hazard with the PPE and equipment that has been provided ant the exposure limit could easily be exceeded.
8. The situation is unclear, or data are lacking on important factors. The properties of hazardous substances, such as toxicity, volatility, flammability, explosiveness, corrosiveness, etc. as well as the particular circumstances of the release itself, such as quantity, confined space considerations, ventilation, etc. must be known and understood prior to response.

In addition to potential fire and explosion hazards, strong corrosives and oxidizers typically fall under the property damage category. A large-quantity release that threatens the environment is not a minor spill, but requires the attention of trained responders. If any hazards are present that would damage property or the environment, treat the spill as “large” or “major” and contact University Police at 911 from a campus phone (631-632-3333 from cell phone).

A minor spill is:

- Less than 1 gallon spill of a low toxicity or non flammable chemical or a material that has any NFPA/HMIS rating of 1 or 2;
- A spill involving less than 20 cc/ml of a particularly hazardous chemical (carcinogen, reproductive hazard or acutely toxic), or chemical with any NFPA/HMIS rating or 3 or 4;
- Blood and/or body fluids
- Any amount of chemical material with all NFPA/HMIS ratings of 0

NFPA Rating	Health Hazard (BLUE)	Fire Hazard (RED)	Instability (Reactivity) Hazard (YELLOW)
0	Normal	Will not burn	Stable
1	Slightly Hazardous	Flash Point above 200^{o}F	Unstable if heated
2	Hazardous	Flash Point below 200^{o}F	Violent chemical change
3	Extreme Danger	Flash Point below 100^{o}F	Shock & heat may detonate
4	Deadly	Flash Point below 73^{o}F	May detonate

http://www.hazmat.msu.edu:591/nfpa/ for NFPA ratings

VIII. Biohazard Spills in the Laboratory

A. Employee Contamination

1. If the skin becomes contaminated with blood or other potentially infectious materials, wash the area thoroughly with soap and water.
2. If blood or other potentially infectious material is splashed into the eyes, immediately use the eyewash station, and flush for at least 15 minutes.
3. Remove grossly contaminated clothing immediately. Place the contaminated clothing in a plastic bag.
4. Report the spill to the Supervisor, and seek medical attention.
5. File an incident report with your department. Specific OSHA paperwork is required for bloodborne pathogens exposure. See *Occupational Exposure to Bloodborne Pathogens*, EH&S Policy 1-4 (http://www.stonybrook.edu/facilities/ehs/policy/EHS_1-4.pdf) for specific information.

B. Clean Up

1. Wear the appropriate personal protective equipment (PPE) to clean up the spill. At a minimum, this includes gloves, protective eyewear and a mask, or a faceshield. Depending on the size and type of spill, impervious gowns, protective foot coverings, or respirators may be needed.
2. Pick up any broken glass with tongs or some other mechanical device. Do not use your hands.
3. Place absorbent towels over the spill, making sure not to spread the liquid.
4. Carefully pour a dilute bleach solution (1:10) or other EPA registered tuberculocidal agent over the absorbent towels. Let this remain for 10 minutes in order to disinfect the spill.
5. Carefully pick up the absorbent towels, and place into a plastic bag. Wash the contaminated area again with the bleach other disinfectant. Rinse the area with water.
6. All PPE, towels, and other items that became contaminated must be disposed of a regulated medical waste.
7. Wash hands and any other exposed skin with soap and water before leaving the work area.

C. Spills or Breakage in a Centrifuge

1. Turn off the centrifuge, and allow it to come to a full stop before opening the cover.
2. Wear the appropriate PPE to clean the spill.
3. Remove any broken glass with tongs, and clean the spill as outlined above.

D. Spills in a Biological Safety Cabinet or Laminar Flow Hood

1. Do not shut off the ventilation. The cabinet should be left running to prevent the escape of contaminants. If there is a UV light, leave it on.

2. Wear the appropriate PPE. If the material is infectious, a respirator may be needed. Contact the Department of Environmental Health and Safety for additional information.
3. Use a diluted bleach solution (1:10) or an EPA registered tuberculocidal agent to disinfect the cabinet. Wipe the walls, work surfaces, and equipment with the disinfectant. Use sufficient amount of the disinfectant to ensure that the drain pans and catch basins below the work surface get disinfected. Lift the front exhaust grill and tray and wipe all surfaces. Let the disinfectant stand for 10 minutes. Wipe the catch basin and drain the disinfectant into a container. Wipe the area with water.
4. This procedure will not disinfect the filters, blowers, air ducts, or other interior parts of the cabinet. If the cabinet is to be sterilized, contact the Department of Environmental Health and Safety for additional information.

IX. Chemical Spills

A. Employee Contamination

1. Call 911 (campus phone, 631-632-3333 cell phone) to report the spill and request assistance from EH&S.
2. Assist victim with appropriate first aid and move to fresh air.
   a. DO NOT become contaminated by the chemical as you give first aid.
   b. DO NOT try to neutralize any chemical.
   c. DO NOT disturb a blister or remove dead skin from a chemical burn.
   d. DO NOT apply any household remedy such as an ointment or salve to a chemical burn.
3. If the skin becomes contaminated with hazardous materials, wash the affected area thoroughly with copious amounts of water. If available, use the Emergency Shower for at least 15 minutes.
4. If hazardous material is splashed into the eyes, immediately use the eyewash station, and flush for at least 15 minutes.
5. Remove grossly contaminated clothing, including shoes, immediately. Place the contaminated clothing in a plastic bag.
6. Report the spill to the Supervisor, and seek medical attention.
7. File an incident report with your department.

B. Small Chemical Spill Clean Up – Incidental Spill

1. These spills can be cleaned up by trained laboratory personnel.
   Examples:
   a. Less than 1 gallon spill of a low toxicity or non flammable chemical or a material that has any NFPA/HMIS rating of 1 or 2;
   b. A spill involving less than 20 cc/ml of a particularly hazardous chemical (carcinogen, reproductive hazard or acutely toxic), or chemical with any NFPA/HMIS rating or 3 or 4;
   c. Blood and/or body fluids
   d. Any amount of chemical material with all NFPA/HMIS ratings of 0

2. Notify fellow workers in vicinity of spill.
3. Secure area by restricting access and posting signs.
4. Wear the appropriate personal protective equipment (PPE) to clean up the spill. At a minimum, this includes gloves and protective eyewear (chemical splash goggles). Depending on the size and type of spill, protective clothing (lab coat and apron), and protective foot coverings may be needed. If high splash potential exists, also wear a face shield over the chemical splash goggles.
5. Shutdown equipment:
   a. Close doors and shut HVAC vents if possible.
   b. Close all chemical containers.
   c. Close fume hood sash (leave fume hood ON).
   d. Turn off heating devices.
   e. Stop any reactions in progress.
   f. If flammable material spills, turn off sources of heat and ignition in entire lab.
6. Gather and review safety information on spilled chemical. Review chemical's Material Safety Data Sheet (MSDS) for a hazard assessment and other pertinent information. Important information to know before beginning clean up includes:
   a. Flammability: Flash Point and Vapor Pressure
   b. Toxicity: PEL, TLV
   c. Corrosiveness: pH
7. Locate an appropriate spill kit.
8. Pick up any broken glass with tongs, dust pan and broom, or some other mechanical device. Do not use your hands to pick up the broken glass. Dispose of glass in an appropriate container (e.g. heavy cardboard box which is taped shut and marked "BROKEN GLASS" prior to disposal).
9. Confine and contain spill. Place absorbent material over the spill, making sure not to spread the liquid. Protect drains – do not allow any spilled material to enter drains.
   a. Liquid Spills:
      i. Cover spill material with absorbent. Work from outside to center of spill to avoid spreading liquid.
   b. Flammable Solvents:
      i. Immediately turn off any open flames, heating devices, instrument or machine near the spill that could spark and cause the solvent vapors to ignite and flash back.
      ii. Use plastic scoops and dust pan to clean up absorbent material.
   c. Acids (except HF)
      i. It is not necessary to neutralize an incidental spill. Use absorbent material.
      ii. Decontaminate area after removal of absorbent. Check pH if possible.
   d. Powder Spills:
      i. Do not dry sweep material. This will cause powder to become airborne and spread. Thoroughly wet material with water (or appropriate material) first.
   e. Alkali Metals
      i. Smother with dry sand. Avoid contact with water.
      ii. Do not dry sweep material.
   f. Mercury

i. Cover with mercury decontaminating powder.
ii. Do not dry sweep material. Use aspirator bulb or wet paper towels to collect mercury beads.
iii. Use a flashlight to detect mercury beads that may have spread.

g. Gas Leak
i. Turn off gas cylinder if possible.
ii. If gas is toxic, corrosive or flammable, evacuate area and call University Police at 911.

10. Clean up spill using a scoop or other suitable item and place material in appropriate disposal container.
11. Decontaminate spill surface with mild detergent and water, as appropriate. Carefully remove PPE, place non-reusable items in disposal container and thoroughly wash hands.
12. Dispose of all contaminated material in a plastic bag. Label the bag with the name of the hazardous material. Complete a hazardous waste label and affix label to container. Contact the Department of Environmental Health and Safety for disposal.
13. Investigate cause of spill and review with EH&S. Document spill, response and follow-up with staff. The incident report must include the following:
    a. Type of emergency
    b. Name of material spilled, including pH, strength, concentration, etc.
    c. Area of spill and estimate of volume
    d. Remediation performed
    e. Any follow-up that may be necessary
    f. Contact person
    g. Names of people who may have been exposed to substance
14. Replenish spill kit.

C. Large Chemical Spill Clean Up – Emergency Response

1. These spills must be cleaned up a Hazardous Materials Emergency Response Team. **DO NOT ATTEMPT TO CLEAN A MAJOR SPILL!**
   Examples:
   a. The release requires evacuation of employees in the area.
   b. The release poses, or has the potential to pose, conditions that are immediately dangerous to life and health (IDLH).
   c. The release poses a serous threat of fire or explosion (exceeds or has the potential to exceed the lower explosive limit or lower flammable limit).
   d. The release requires immediate attention because of imminent danger.
   e. The release may cause high levels of exposure to toxic substances.
   f. There is uncertainty that the employee in the work area can handle the severity of the hazard with the PPE and equipment that has been provided ant the exposure limit could easily be exceeded.
   g. The situation is unclear, or data are lacking on important factors. The properties of hazardous substances, such as toxicity, volatility, flammability, explosiveness, corrosiveness, etc. as well as the particular circumstances of the release itself, such

as quantity, confined space considerations, ventilation, etc. must be known and understood prior to response.

h. In addition to potential fire and explosion hazards, strong corrosives and oxidizers typically fall under the property damage category. A large-quantity release that threatens the environment is not a minor spill, but requires the attention of trained responders. If any hazards are present that would damage property or the environment, treat the spill as "large" or "major".

2. Evacuate the area and close all doors. Notify others not to enter the area. Post signs.
3. If possible, put absorbent material around the spill to prevent it from spreading, particularly into drains or under cabinets.
4. Call University Police at 911 (cell: 631-632-3333) and give details of spill including specific location, chemical, quantity, and if anyone is injured.
5. During the evacuation, If possible, shutdown equipment:
    a. Close doors and shut HVAC vents if possible.
    b. Close all chemical containers.
    c. Close fume hood sash (leave fume hood ON).
    d. Turn off heating devices.
    e. Stop any reactions in progress.
    f. If flammable material spills, turn off sources of heat and ignition in entire lab.
6. For spills of highly hazardous material or present a fire hazard, activate the fire alarm by pulling the nearest fire alarm box.
7. Inform the Hazardous Materials Response Team the location, the name of the material that spilled and the approximate quantity of spilled material. Staff knowledgeable about the spill should provide responders with all pertinent information and MSDS.
8. Do not reenter the area until advised by the Department of Environmental Health and Safety that it is safe to do so.
9. Investigate cause of spill. Document spill, response and follow-up with staff and contact EH&S. The incident report must include the following:
    a. Type of emergency
    b. Name of material spilled, including pH, strength, concentration, etc.
    c. Area of spill and estimate of volume
    d. Remediation performed
    e. Any follow-up that may be necessary
    f. Contact person
    g. Names of people who may have been exposed to substance

X. Radioactive Materials Spills

Radioactive material spills are chemical spills with the added radioactivity hazard and perhaps a biological hazard. Spill response must include all procedures. If it is determined that the spill meets the definition of an incidental chemical release, the radioactive material spill must then be assessed to be a "minor" or "major" spill. The activity level (in uCi) and the isotope involved determine the level of spill response (incidental response vs. emergency response). See the *Radiation Emergency Spill Procedures*, EH&S Policy 6-7 for additional information.

Hazard	Activity Level	Isotope *(example)*
Low	Above 1 mCi, treat as a major spill*	H-3, F-18, Zn-69
Medium	Above 100 uCi, treat as a major spill*	C-14, P-32, S-35, Cl-36, Cr-51, Fe-55, Cu-64, Zn-65, Ag-111, Cd-109, Tl-201, U-135
High	Above 10 uCi, treat as a major spill*	Na-22, Sr-90, I-131, Cs-137

*Below this Activity Level, treat as a minor spill with lab staff following clean-up procedures listed below. A major spill will be remediated by EH&S Radiation Protection Services staff.

A. Spill Procedure When Airborne Contamination is Possible

1. Evacuate the laboratory immediately. Warn others in the vicinity.
2. Close and lock the doors or stand guard to prevent entrance. Warn others in the vicinity.
3. Perform a personal survey of all areas of the body. Remove any contaminated clothing, shoes, lab coat etc.
4. If skin contamination is discovered, see **Personal Decontamination** section.
5. Immediately contact University Police at 911 and request an EH&S Radiation Protection Services representative.
6. Before leaving the area to call the Radiation Protection Services, remove shoes if contaminated. Do not touch anything.
7. Close door, and, where possible, adjust ventilation to prevent spread of airborne contamination.

B. Spill Procedure When Contamination is not Airborne

1. Localize the spill. Place absorbent material on a liquid spill.
2. Survey the area for extent of contamination.
3. If spilled materials have dried, lightly wet down the area where the spill occurred with water. Be careful not to spread contamination.
4. Isolate contaminated area.
5. Do not track contamination around the laboratory. Call out for help; do not go for help if possible.
6. Perform a personal survey of all areas of the body. Remove any contaminated clothing, shoes, lab coat etc. See **Personal Decontamination**.
7. Check shoes before leaving the area of a cleaned up spill.
8. Immediately contact University Police at 911 and request an EH&S Radiation Protection Services representative.

C. Personal Decontamination

1. Perform personal survey of all areas of the body.
2. Remove contaminated clothing.
3. If skin contamination is discovered, use luke-warm soapy water and wash for 2-3 minutes. It is important to not allow any radioactive material to enter your skin which can cause internal contamination. Use mild soap (e.g., Dove or Ivory), gentle washing and copious amounts of

water.
4. Be especially thorough in flushing out wounds.
5. If thorough washing does not remove contamination from the body, consult Radiation Protection Services.
6. Immediately contact University Police at 911 and request an EH&S Radiation Protection Services representative.
7. Monitor all persons involved in the clean up.
8. Permit no person to resume work in the area until Radiation Protection Services has made a final survey and given approval for reoccupancy.
9. Notify others not to enter the area.
10. Isolate contaminated items and hold for Radiation Protection Services.

REMEMBER:

S Stop all work and contain spill
W Warn others
I Isolate Area
M Minimize exposure and monitor
N Notify Radiation Protection Services

XI. Water Loss

Supervisors and workers are required to anticipate the consequences of loss of water to the laboratory where employee safety may be impacted. The emergency eyewashes and showers will not operate and therefore will not provide protection in the event of a hazardous material contamination. Water cooling systems for equipment (i.e., distillation apparatus) will not work. Secure all hazardous experiments and make sure that any experiments in progress are stabilized and discontinued until water service is returned to normal.

If the water loss occurs during off hours, check all laboratories that may be running overnight experiments. Contact the persons involved so that they can properly secure their hazardous experiments.

XII. Power Failures

Supervisors and workers are required to anticipate the consequences of an electric power interruption where employee safety may be impacted. Laboratory operations can pose a significant risk to building occupants during an extended power failure, therefore, lab personnel must take appropriate actions to safeguard systems and operations. Laboratory personnel are not allowed to bring in a generator to run equipment. This guidance assumes the laboratory building ventilation system is not operational.

Before a Power Outage

1. Make a list of equipment that must be reset or restarted. Keep instructions for doing so in a nearby place. Equipment that operates unattended should be programmed to shut down safely during a power failure and to not restart automatically when power returns.
2. Make a list of critical equipment that should be on emergency power. Check regularly that this equipment is plugged into the emergency power supply (if available). Consider purchasing a UPS (uninterruptible power supply) unit for computers or other similar equipment.
3. Identify a source of dry ice or liquid nitrogen for use during an extended power outage. Have a safety plan for using the cryogenic material (cryo-gloves, faceshield).
4. Do not store flammables in domestic refrigerators at any time. This is an even greater hazard during a power outage because vapor concentration may increase as temperature increases, creating an explosive atmosphere inside of a unit where sparking is imminent when the power returns.
5. Leave at least one flashlight in each area for use during a power outage. Use the type that is continuously recharged or keep fresh batteries with the flashlight.
6. If possible, avoid riding in elevators during a power alert. Elevator doors will not open when power is interrupted. Always use the stairs during an emergency.

While the Power is Off

1. Secure all hazardous experiments. Make sure that any experiments in progress are stabilized and discontinued.
2. Securely cap all chemical containers, extinguish all flames, close gas valves, store cultures and secure radioactive materials.
3. Completely close the sash of each fume hood in your lab.
4. Power off all equipment so it does not reenergize when power is restored to the building.
5. Close all interior lab doors to reduce spread of hazardous vapors and improve fire safety risks.
6. Check any equipment on emergency power. It may take up to 30 seconds for the emergency power to kick in. Items not permanently connected to emergency power outlets should not be connected during a power interruption.
7. Exit the lab and lock exterior lab doors.
8. Evacuate the building and follow established Departmental specific directives and supervisor guidance regarding alternate work locations.
9. If the power loss occurs during off hours, check all laboratories that may be running overnight experiments. Contact the persons involved so that they can properly secure their hazardous experiments.
10. Coordinate the use of temporary emergency power with CO&M and the Building Manager. Do not bring in electric generators to operate equipment.

When the Power Returns

1. Reset/restart/check equipment. In particular, check to ensure airflow of your fume hood has been restored. If your fume hood has not automatically re-started, call CO&M (2-6400). Keep the sashes closed and do not use the hood until you are sure the hood exhaust system is working.

XIII. Severe Weather

Laboratory equipment, materials and research can be protected from loss during severe weather events, by taking appropriate precautions that will minimize the impact of dangerous conditions (e.g. wind, rain, ice, etc.) and loss of services (e.g. electric power, heat, air conditioning, water, etc.). Prepare a lab contingency plan, including the items noted below, that meets your specific needs. This plan should be shared with your department and provided to your Building Manager for inclusion in the Building Emergency Plan.

The Laboratory Severe Weather Plan should be implemented to protect personnel, equipment, and laboratory facilities whenever a severe weather event threatens laboratory operations, or when directed by the University's Emergency Management system. Remember, you must take responsibility to protect your own laboratory and research.

Laboratory Shutdown Procedures

1. Shutdown experiments that could be affected by the loss of electricity, water, or other services.
2. Close the sash on all chemical fume hoods in the event that ventilation is lost.
3. Remove all infectious materials from biosafety cabinets, and autoclave, disinfect, or safely store them as appropriate.
4. Ensure that all chemical, radioactive and hazardous waste containers are properly covered and sealed.
5. Ensure that all gas valves are closed. If available, shut off gas to area.
6. Turn off all appliances, computers, hot plates, ovens and other equipment.
7. Review storage of perishable items. Consolidate valuable items within storage units that have backup systems or store items in duplicate locations as appropriate. Review safety precautions for the use of alternate cooling methods (e.g. liquid nitrogen, dry ice, etc.), if used (see Section XII. Power Failures).
8. Ensure that water reactive chemicals are in sealed containers and stored in areas that are unlikely to become wet.
9. Check that all gas cylinders are secured. Remove regulators and use caps.
10. Elevate equipment, materials and supplies, including electrical wires and chemicals, off of the floor, particularly in lower elevations that are prone to flooding.
11. Update emergency contact numbers for your lab. Ensure that they are properly posted on lab doors and provided to your department.
12. Secure lab notebooks and backup critical data on computers.
13. Close all doors, including cabinets, storage areas, offices and utility chase-ways. Lock all exterior lab doors before leaving.

TITLE: **Laboratory Emergency Plan**	POLICY: **2-2**

Appendix:

1 **Guide for Chemical Spill Response Planning in Laboratories: Spill Prevention Methods**
2 **Laboratory Emergency Plan Template**
3 **Chemical Specific Responses: Acids/Bases, Flammable Solvents, Formaldehyde, Mercury, HF, Osmium Tetroxide**
4 **Laboratory Emergency Plan Summary**
5 **Spill Caution sign**

INQUIRIES/REQUESTS:

Environmental Health and Safety
110 Suffolk Hall
Zip 6200
Main Office: 632-6410
FAX: 632-9683

RELATED FORMS:

Laboratory Emergency Plan Template (Appendix 2)
Hazardous Material Spill Warning Sign (Appendix 4)
Are You Prepared? Severe weather laboratory preparation checklist
(http://www.stonybrook.edu/ehs/lab/labemerg.shtml)

RELATED DOCUMENTS:

OSHA 29 CFR 1910.120 *Hazardous Waste Operations and Emergency Response*
OSHA 29 CFR 1910.1030 *Occupational Exposure to Bloodborne Pathogens*
OSHA 29 CFR 1910.1450 *Occupational Exposure to Hazardous Chemicals in Laboratories*
NFPA 45 *Standard on Fire Protection for Laboratories Using Chemicals*, 2004 Edition
Occupational Exposure to Bloodborne Pathogens, EH&S Policy 1-4
(http://www.stonybrook.edu/facilities/ehs/policy/EHS_1-4.pdf)
Chemical Hygiene Plan, EH&S Policy 4-2
(http://www.stonybrook.edu/facilities/ehs/policy/EHS_4-2.pdf)
Radiation Emergency Spill Procedures, EH&S Policy 6-7
(http://www.stonybrook.edu/facilities/ehs/policy/EHS_6-7.pdf)
Hazardous Waste Management Program, EH&S Policy 8-1
(http://www.stonybrook.edu/facilities/ehs/policy/EHS_8-1.pdf)

Appendix 1. Guide for Chemical Spill Response Planning in Laboratories

Prepared by the American Chemical Society's CEI/CCS Task Force on Laboratory Waste Management American Chemical Society, Washington, DC. 1995

http://www.chemistry.org/portal/a/c/s/1/acsdisplay.html?DOC=government%5Cpublications%5Ctech_spillrepsonse.html

Preface

The objective of this guide is to provide laboratory employees with a framework for spill response planning. This planning must be done in advance, not after a spill occurs.

All spills are different; this guide cannot give definitive guidance on how to handle every one. One thing is clear, however a professional response to spills, from planning to properly using cleanup equipment, will reduce the eventual costs (in injury, pollution, dollars, pride, and job security).

Spill Prevention Methods

Common examples of spill-causing incidents and associated prevention techniques are shown in Table 1.

Laboratory spills can occur during a chemical's storage, transportation, or transfer, as well as in the actual experiment. A spill prevention program for storage areas should include the following:

- sturdy shelves and properly designed storage areas to minimize breakage and tipping;
- containers stored by hazard class;
- larger containers stored closer to the floor;
- containers stored on shelves sufficiently away from the shelf edge to minimize the danger of falling;
- storage shelves with lips to reduce the danger of falling;
- regular inspection of the integrity of containers; and
- seismic security in earthquake-prone areas.

To minimize spills during transport, a laboratory should integrate the following:

- carts, where appropriate,
- safety containers,
- rubberized buckets,
- straps to secure containers, and
- properly trained and thoughtful workers.

For the transfer of liquids from one container to another, the risk of spills can be reduced by

- paying careful attention to the size of containers to avoid overfilling;
- using pumps or other mechanical devices rather than simply pouring directly into a container;
- providing spill containment to capture any leaks; and
- bonding and grounding containers when flammable liquids are involved.

In addition to chemical spills, water spills can be caused by loose connections or breaks in lines to water condensers or cooling systems. Such spills can cause damage and inconvenience, even if they do not present environmental or health risks. Appropriate planning, including use of security clamps or other devices to prevent loosening of connections or automatic shut-off devices, can reduce the likelihood of flood damage. Occasionally, a laboratory may be affected by a leaking roof or a flood elsewhere in a building. Planning to prevent damage from incidents should include the protection of instruments that might be harmed by water. Similarly, storing chemicals and supplies so that they will not be touched by leaking water will minimize damage and inconvenience.

While considerable attention is given to potential spills or leaks of liquids, laboratories using gases should also develop spill prevention plans for these materials. Such plans should consider safety concerns related to securing tanks and other gas containers. Additionally, frequent checks of valves and tubing can be useful in spill and leak prevention. A laboratory should take care to prevent gas from escaping down a drain or up a fume hood.

Finally, pay attention to physical details in the laboratory, such as

- reducing clutter and unnecessary materials,
- eliminating tripping hazards and other obstructions, and
- having all needed equipment readily available before starting work.

Table 1. Accident Prevention Techniques

Potential Cause of Spill	Prevention Technique
Container, such as a flask or beaker, tips over	Secure containers and equipment to minimize the possibility of tipping.
Container dropping	Keep containers and experimental equipment as low as possible.
Breaking a container or a piece of experimental apparatus	Protect containers from breakage by keeping other items from falling on them.
A runaway reaction	Plan experimental reactions to anticipate and to provide controls for undesired outcomes such as overheating.
Releases during transfer of materials from one container to another	Pay attention to what you are doing. Provide secondary containment in the event of spills.
Holes and other leaks in transfer equipment such as pipes, hose, or valves	Check for holes or leaks before use.
Placing material in an incompatible container	Check for compatible uses of chemicals, particularly solvents or aggressive solutions. Check the material and construction of containers and equipment with a goal of maintaining structural integrity.
Breakage of thermometers or similar experimental equipment	Select equipment that has reduced potential for breakage, e.g., replace mercury thermometers and electronic temperature

Appendix 2. Laboratory Emergency Plan

Building:	**Room:**	**Phone Number:**
The following people are designated and trained to assist Emergency Responders with information about this lab, including providing a hazardous material inventory[1], during an emergency:		
Name	**Title**	**24 Hour Contact Phone**
	Principal Investigator/Lab Director	

When the fire alarm sounds, lab workers must EXIT the building, but first:

1. Turn off all flames and other ignition sources
2. Close all hazardous material containers
3. Close sash on all fume hoods
4. Turn off all electrical equipment
5. Other:

The following emergency equipment is located in this room:

☐ Emergency Eyewash ☐ Fire Extinguisher ☐ Spill Kit/Control Equipment
☐ Emergency Shower ☐ Fire Blanket ☐ Phone ☐ Other:

The following emergency equipment is not located in this room, but can be found at:

Equipment	*Location*

If your clothing catches on fire:

1. "STOP, DROP and ROLL"
(if someone else is on fire, knock them to the ground, and instruct them to roll back and forth)
2. Cover your face with your hands.
3. Use a fire blanket (if available) or a coat to help smother the flames. Never use a fire extinguisher on someone.

If there is a hazardous material spill:

1. Determine if this is a "major" or "minor" spill.
2. Assist anyone who may have been contaminated or injured during the spill.
3. Clean up minor spills using appropriate spill control equipment.
4. Call University Police (911 or 631-632-3333) for all major spills. Evacuate the area and do not let anyone enter until Emergency Responders have cleaned up the spill.

If you need to use the emergency shower or eyewash:

1. Pull the handle to start the water flowing.
2. Hold your eyes open to get the water under your eyelids.
3. Remove all contaminated clothing and shoes.
4. Stay under the water for at least 15 minutes to get all the chemicals off.

The quickest and safest way out of this room during an evacuation is:

If this primary route is not safe, the other way out is:

All lab staff are to meet at this location outside the building after evacuation. Take attendance to ensure that everyone has safely exited:

Do not re-enter the building or laboratory until the Emergency Responders have notified everyone that it is safe to return!

Call 911 (campus phone) or 631-632-3333 for all emergencies!

[1] An inventory that includes the quantities and locations of all flammable, pyrophoric, oxidizing, toxic, corrosive, reactive, radioactive materials, nonionizing radiation, biological materials, and compressed and liquefied gases.

Appendix 3. Chemical Specific Response

This Appendix lists some chemical specific cleanup responses. Examples of cleanup material are provided. These are recommended spill cleanup material and resources for buying the material. Other cleanup kits and resources are available and can also be used.

Spill-X Spill Control Agents are available for a number of different applications and packages, including Spill-X-A for Acid spills, Spill-X-C for Caustic spills, Spill-X-S for Solvent spills and Spill-X-FP for spills of formaldehyde. Each bottle can treat up to a 0.5 gallon spill which is equivalent to approximately a 15 - 20 ft.2 spill. The exact spill area which can be properly treated is a function of the acid, caustic, and solvent type, as well as the concentration. Use to solidify and reduce vapor release from solvent or formaldehyde spills. Neutralize and solidify acid or caustic spills. Properly treated spills greatly reduce the costs of spill handling, transport, and waste disposal. Fisher Product 17-987-144A

1. Acids/ Bases

Spill-X-A for Acid Spills is effective on spills of mineral and organic acids and will neutralize and solidify acids. It is red in color to differentiate it from other spill control agents. Spill-X-C for Caustic Spills will neutralize and solidify caustics. It is tan in color to differentiate it from other spill control agents.

2. Flammable Solvents

Spill-X-S for Solvent/Fuel spills reduces evaporative losses by adsorption and when topped off with and additional layer of Spill-X-S agent elevates the flashpoint above 14o degrees F. of most organic solvents. It is black in color to differentiate it from other spill control agents.

3. Formaldehyde

Spill-X-FP® Formaldehyde Polymerizer Rapidly treats formaldehyde spills and reduces the amount of vapors. Reacts with aqueous formaldehyde to form a polynoxylin polymer. Urea-based. Lab Safety Supply Co. Product # 9894

4. Mercury

500gm Hg Absorb™ Powder to amalgamate mercury droplets, scoop to pick up amalgam, four 250gm Hg Absorb Jars for absorption of tiny droplets, Indicator to identify additional mercury that may have been missed and 1-1/2 lb. Mercury vapor Adsorbent for inaccessible spill areas. Also includes protective glasses, gloves and two disposal bags. Lab Safety Supply Co. Product # 20876

5. HF – Hydrofluoric Acid

When working with hydrofluoric acid or concentrated HF solutions (> 1%):

1. Wear goggles and a face shield. Wear a long-sleeved, buttoned lab coat, pants or long skirt, and closed-toe shoes. Wear Neoprene or Nitrile (22mil) gloves or other hydrofluoric acid resistant gloves (HF burns around the fingernails are extremely painful, difficult to treat, and may require surgical removal of the nail). A chemical resistant apron is also recommended.
2. Hydrofluoric Acid use requires "antidote" gel in lab. Make sure to have a tube of Calgonate on hand in case HF comes into contact with the user's skin. Train all HF users. Check expiration date. Pharmascience calcium gluconate. http://cagluconate.com
3. Any person exposed to HF must seek immediate medical assistance. Immediately after the areas exposed to HF have been flushed with water, apply Calgonate freely and massage it into the affected site. Reapply Calgonate every 10-15 minutes, until pain and/or redness disappear or until emergency medical assistance is given.
4. In order to prevent cross contamination, the victim should self-apply Calgonate. If the victim is unable to, anyone present can do it after putting on the Neoprene or Nitrile (22mil) gloves. Do not use latex gloves; they are not effective against HF. Note the time when Calgonate was first applied to the contaminated area. Provide this information to the EMS team

SPILLS AND EMERGENCIES

For large spills (more than 20 mls) and fires, immediately call University Police at 911 and evacuate the area.

If HF is spilled outside a chemical fume hood, evacuate the area. Close the doors. Post the area with a sign to prevent others from entering. Small spills of HF inside a chemical fume hood can be cleaned up by laboratory staff if they have the correct equipment, understand the hazards, and know how to clean up the spill safely and dispose of the waste properly. Lime soda, ash, sodium bicarbonate, or a spill absorbent specified for HF should be used for clean up. Organic spill kits that contain Floor-dri, kitty litter, or sand should not be used because HF can react with silica to produce silicon tetrafluoride, a toxic gas.

If HF is spilled or leaked, take the following steps:

1. Restrict persons from area of a leak until cleanup is complete.
2. Ventilate area of spill or leak.
3. If a gas leak, evacuate area and stop flow of gas. If source of leak is a cylinder and the leak cannot be stopped in place, remove the leaking cylinder to a safe place in the open air, and repair leak or allow cylinder to empty.
4. If a liquid spill, cover with sodium carbonate or an equal mixture of soda ash and slaked lime. After mixing, add water if necessary to form a slurry.
    a. **HF Acid Eater™ Spill Kit**: Neutralizes hydrofluoric acid into safe, inorganic salts. Nonhazardous, noncorrosive and biodegradable. Completely destroys hydrofluoric acid using a 1:1 neutralization ratio. pH indicators replace the need for pH strips. *Kit Includes:* 2-gal. HF Acid Eater, two aprons, two pairs

of gloves, haz-mat boot covers, two pairs of goggles, MSDS and instructions. Lab Safety Supply Product # 84427

5. It is necessary to contain and dispose of HF as a hazardous waste. Contact the Department of Environmental Health and Safety for specific recommendations.

6. Osmium Tetroxide

Decontamination:
A 2% osmium tetroxide solution can be neutralized with six times its volume of corn oil soaked absorbent (100 grams of absorbent and 50 milliliters of corn oil). Test for completeness of reaction by suspending a corn oil soaked filter paper over the area. Blackening of the filter paper indicates osmium tetroxide is still present. This mixture must be disposed of as hazardous waste.

Spill and Accident Procedures:
Small spills: Sufficient quantities of corn oil absorbent must be kept in labs using osmium tetroxide. Cover small quantities of spilled osmium tetroxide with this mixture. Test for completeness of reaction before cleaning up absorbent.

Large spills: Notify others in the area. Evacuate room. Contact University Police at 911 and request Hazardous Materials Response Team.

Appendix 4. Laboratory Emergency Plan Summary

Emergency	Prevention/Mitigation	Preparation	Response	Remediation
Biological Spill	- Good work practices. - Wear appropriate PPE.	- Review Policy. - Training.	- Clean up spill.	- Decontaminate area after clean up. - Dispose of all material appropriately. - Investigate cause of spill and review with EH&S. Document spill, response and follow-up with staff. - Replenish spill kit.
Biosafety Cabinet Failure	- Have BSC inspected & certified annually.	- Review Policy. - Plan to contain.	- Leave fans on. - Use disinfectant to clean all surfaces.	- Have BSC inspected.
Chemical Spill	- Good work practices. - Wear appropriate PPE. - Secondary Containment.	- Spill Kit. - Training. - Have MSDSs available & review before working with material.	- Decide if spill is incidental or large. - Clean up incidental spill. - Call 911 for large spill & evacuate area.	- Decontaminate area after clean up. - Properly dispose of all Hazardous Waste. - Investigate cause of spill and review with EH&S. Document spill, response and follow-up with staff. - Replenish spill kit.
Fire	- Reduce flammable chemical storage. - Use flammable storage cabinets.	- Fire Extinguisher. - Sand Bucket. - Evacuation Training. - Know location of emergency gas shut off.	- Pull Alarm. - Call 911. - Evacuate. - Contact EH&S for all fires, even if extinguished by staff.	- Call EH&S to have fire extinguisher replaced.

TITLE: **Laboratory Emergency Plan**	POLICY: **2-2**

Emergency	Prevention/Mitigation	Preparation	Response	Remediation
Fume Hood Failure	- Install Fume Hood alarm. - Measure face velocity before using.	- Review EH&S Policy 4-5. - Plan to contain any vapors.	- Close containers. - Close sash. - Call CO&M if fume hood is not working.	- Contact EH&S to verify proper air flow after repairs.
Medical (personal contamination)	- Good work practices. - Wear appropriate PPE.	- First Aid kit. - Emergency Phone Numbers. - Test emergency eyewash & showers. - Have MSDSs available. - Have HF antidote.	- Assist victim. - Get medical treatment.	- Wash area. - Dispose of contaminated clothing/leather items. - Replenish First Aid Kit.
Power Failure		- Identify critical equipment. - Ensure UPS or other emergency power supply is available. - Update phone list. - Post sign on lab door when running an unattended experiment – include contact number, materials involved and directions in case of water or power failure.	- Shut off equipment. - Secure all experiments. - Close chemical containers, fume hood. - Exit building.	

TITLE: **Laboratory Emergency Plan**	POLICY: **2-2**

Emergency	Prevention/Mitigation	Preparation	Response	Remediation
Radiological Spill	- Good work practices. - Frequent area surveys with appropriate instrumentation when using RAM (End of Day Surveys). - Wear appropriate PPE. - Secondary containment.	- Review EH&S Policy 6-7.	- Isolate area. - Survey personnel. - Interview personnel involved. - Survey unrestricted areas. - Decon from least contaminated areas toward greatest contamination. - Skin & Surface Decon cleaners. - Use appropriate shielding materials. - Use appropriate instrumentation. - Decon to <200dpm/100cm ^{2} removable. -Shield and/or isolate all fixed contamination to ALARA.	- Survey area & decontaminate as needed. - Properly dispose of all hazardous waste. - Investigate cause of spill and review with EH&S. Document spill, response and follow-up with staff. - Replenish spill kit.
Severe Weather		- Update phone list. - Secure drums stored outside (i.e. HMMF).	- Secure all hazardous materials. - Move electrical equipment off floor & unplug. - Backup/take critical data.	

TITLE: **Laboratory Emergency Plan**	POLICY: **2-2**

Emergency	Prevention/Mitigation	Preparation	Response	Remediation
Water Loss		- Update phone list. - Post sign on lab door when running an unattended experiment. Include contact number, materials involved and directions in case of water or power failure.	- Secure all hazardous materials. - Do not run hazardous experiments until water service is returned.	- Test emergency eyewash station to ensure water is running.

Appendix 5. Spill Caution Sign