A. Purpose

Preparedness is a critical component of emergency response. The purpose of this policy is to define responsibilities and provide guidelines for the maintenance of laboratory spill kits at Columbia University.

B. Applicability/scope

This policy is for Columbia University’s Morningside Campus, Medical Center, Lamont-Doherty Earth Observatory (LDEO), and Nevis Laboratory, and includes:

- personnel who store, handle, use, or work near hazardous materials in a laboratory;
- emergency responders, including, but not limited to, Columbia University’s Environmental Health and Safety Office and the LDEO Safety Office.

C. Responsibilities

All Columbia University laboratories shall have access to a chemical spill kit, capable of controlling a manageable spill of hazardous materials in the laboratory. A spill kit can be assembled by the laboratory or purchased commercially through a laboratory supply company. Each laboratory must have ready access to a spill kit for the hazardous substances used or stored in the laboratory.

Note, for a list of spill kit supply requirements, see Section E. – Procedures. A list of purchasing suppliers can be found in Appendix A. For purchasing recommendations, visit Environmental Health & Safety’s website at www.ehs.columbia.edu or contact Environmental Health & Safety at labsafety@columbia.edu.

There are varying requirements for spill kit maintenance at each Columbia University campus, as follows:

1. Columbia University Morningside Campus

General spill kits are located in the hallways of all laboratory floors at the Columbia University Morningside Campus. These kits are wall-mounted, and are designed to provide the resources for addressing most manageable spills. These spill kits do not contain supplies to address spills of particularly hazardous substances such as formaldehyde, mercury, hydrofluoric acid, and radioactive materials. In order to address these materials, additional spill kits are required and must be purchased and maintained by the laboratory.

i. Environmental Health and Safety (EH&S): Trains laboratory personnel on spill kit contents, locations, and use. Stocks and maintains the hallway-
mounted general use spill kits. Conducts annual inspections of spill kits to verify that laboratories have proper spill kit supplies, supplies are not expired, and that laboratory workers know the location of spill kits.

ii. **Laboratory PI:** Responsible for the purchase and maintenance of additional spill kits and supplies designed to cleanup particularly hazardous substances such as formaldehyde, mercury, hydrofluoric acid, and radioactive material.

iii. **Laboratory Workers:** Maintain knowledge and understanding of spill kit contents, location and use. Report to EH&S if the hallway spill kit tamper-proof tape is broken, and if any items in the spill kit are used.

2. **Columbia University Medical Center**

Spill kits are not centrally available. Each laboratory is required to purchase and maintain the required spill kit(s), as needed.

   i. **Environmental Health and Safety (EH&S):** Trains laboratory personnel on spill kit contents and use. Conducts annual inspections to verify that laboratories have proper spill kit supplies, supplies are not expired, and that laboratory workers know the location of spill kits.

   ii. **Laboratory PI:** Responsible for the purchase, proper stocking, and maintenance of spill kit supplies specific to the hazardous substances used or stored in the laboratory.

   iii. **Laboratory Workers:** Maintain knowledge and understanding of spill kit contents, location and use.

3. **Columbia University Lamont-Doherty Earth Observatory (LDEO)**

All spill kits are located in the laboratories and stocked by the LDEO Safety Office.

   i. **Environmental Health and Safety (EH&S):** Trains laboratory personnel on spill kit contents and use. Conducts annual inspections to verify that laboratories have proper spill kit supplies, supplies are not expired, and that laboratory workers know the location of spill kits.

   ii. **Laboratory PI:** Responsible for notifying the LDEO Safety Office of the hazardous materials present in the laboratory.

   iii. **LDEO Safety Office:** Provides the proper spill kit supplies for each lab.

   iv. **Laboratory Workers:** Maintain knowledge and understanding of spill kit contents, location and use. Notify laboratory PI and/or LDEO Safety Office of any supplies that need to be restocked.

4. **Columbia University Nevis Laboratories**

Spill kits are not centrally available. Each laboratory is required to purchase and maintain the required spill kit(s), as needed.
i. **Environmental Health and Safety (EH&S):** Trains laboratory personnel on spill kit contents and locations. Conducts annual inspections to check that laboratories have proper spill kit supplies, supplies are not expired, and that laboratory workers know the location of spill kits.

ii. **Laboratory PI:** Responsible for the purchase, proper stocking, and maintenance of spill kit supplies specific to the hazardous substances used or stored in the laboratory.

iii. **Laboratory Workers:** Maintain knowledge and understanding of spill kit contents, location and use.

D. **Definitions**

Laboratory spill kit responsibilities and requirements are dependent upon governing regulatory agencies’ requirements and institutional policy. Columbia University’s Spill Control Kit policy exceeds regulatory requirements. Additionally, Columbia University takes into account recommendations from the National Academy of Sciences, which states a typical spill kit includes:

- spill control absorbent pads;
- inert absorbents;
- neutralizing agents for acid spills such as sodium carbonate and sodium bicarbonate;
- neutralizing agents for alkali spills such as sodium bisulfate and citric acid;
- large plastic scoops and other equipment such as brooms, pails, bags, and dustpans;
- appropriate Personal Protective Equipment (PPE), warning signs, barricade tapes, waste labels, tongs, clear bags, pH paper and protection against slips or falls on the wet floor during and after cleanup;

**General Spill Kit** – A spill kit that contains items to control most manageable chemical spills. The kit typically includes PPE, absorbent material(s), neutralizing agents, and clean-up materials (i.e. tongs, plastic bags, a pale, etc.), as specified in Section E. – Procedures.

**Manageable Spill v. Unmanageable spills** – Spill kits are to be used by laboratory staff for manageable spills only. A spill is unmanageable if:

- response requirements exceed the comfort level of the lab staff member;
- the spill kit is not capable of cleaning-up the spill;
- the staff member is not properly trained in addressing the spill or using the spill kit;
- respiratory protection is required.

In the case of an unmanageable spill, contact EH&S to respond and properly address the hazard. Note that EH&S has the necessary PPE and training to address most hazards. Additional information on chemical spill procedures for manageable and unmanageable spills can be found at [http://www.ehs.columbia.edu/Policy1.11.html](http://www.ehs.columbia.edu/Policy1.11.html).
Particularly Hazardous Substances – Substances that may require additional spill kit supplies outside of the requirements of a general spill kit (i.e. formaldehyde, mercury, hydrofluoric acid, and radioactive materials).

Calcium Gluconate Gel – Calcium gluconate gel is a topical antidote for hydrofluoric (HF) skin exposure. Calcium gluconate works by combining with HF to form insoluble calcium fluoride, thus preventing the extraction of calcium from tissues and bones and the resulting burns. Keep calcium gluconate gel nearby whenever working with HF. Calcium gluconate should be stored in a refrigerator if possible and replaced with a fresh supply just prior to its expiration date noted on the tube and the packaging. Use disposable exam gloves to apply calcium gluconate gel. Even after applying calcium gluconate, it is essential that a medical evaluation be made in the event of HF exposure.

Hydrofluoric Acid (HF) Neutralizer – HF should not be neutralized with a standard acid neutralizer. Instead HF requires a separate neutralizer that includes calcium, such as calcium bicarbonate. HF neutralizer can be purchased through a supplier. Please see Appendix A for a list of recommended suppliers.

E. Procedures

General Spill Kits must be maintained to have, at a minimum, the following materials. Additional spill materials may be required to ensure proper response to particularly hazardous substances not covered by items in the general spill kit. This includes formaldehyde, mercury hydrofluoric acid, and radioactive materials. Please see Appendix A for a list of recommended spill kit suppliers. Note that all supplies must be replaced prior to expiration date noted on the containers and/or the packaging.

For information and recommendations on personal protective equipment (PPE) (such as gloves, safety glasses/goggles, and laboratory coats) please visit the Columbia Universities Environmental Health & Safety (EH&S) PPE webpage at http://chs.columbia.edu/ppe.html.

For recommendations on other spill kit supplies, please visit the Columbia Universities EH&S website at www.ehs.columbia.edu, or contact EH&S at labsafety@columbia.edu.

1. Columbia University General Chemical Spill Control Kit Content Requirements

- Personal Protective Equipment (gloves, safety glasses/goggles, and laboratory coat, apron, or coverall, applicable to the chemical hazard)
- Universal absorbent pads
- Tongs
- Plastic dust pan and brush
- Small and large clear plastic bags (for collection of spill cleanup material)
- Compatible container (to place spill cleanup supplies)
2. **Columbia University Additional Hazardous Material Spill Control Kit Content Requirements**

i. **Formaldehyde Spill Kit Requirements**
   - Formaldehyde neutralizer
   - Compatible gloves

ii. **Mercury Spill Kit Requirements**
   - Amalgam (mercury absorbent) sponges
   - Amalgam powder
   - Compatible gloves

iii. **Hydrofluoric (HF) Acid Spill Kit Requirements**
   - Calcium gluconate gel
   - Compatible gloves
   - Goggles
   - Compatible apron, laboratory coat, or coverall
   - HF neutralizer

iv. **Radioactive Materials Spill Kit Requirements**
   - Radiation decontamination spray
   - Radioactive marking tape
   - Paper towels

For requirements on the control of pyrophoric materials, cyanide compounds, oils, and other acutely toxic or hazardous substances, please visit the corresponding policies and procedures at [www.ehs.columbia.edu/LabProcedures.html](http://www.ehs.columbia.edu/LabProcedures.html), or contact Environmental Health & Safety. Additionally, formaldehyde and HF have exposure control and safe use policies found at [www.ehs.columbia.edu/PoliciesAndProceduresA-Z.html](http://www.ehs.columbia.edu/PoliciesAndProceduresA-Z.html).

3. **Purchasing**

   - Purchase and maintenance of a general spill kit is required by laboratories at Columbia University Medical Center and Nevis Laboratories. General spill kits can be purchased
as a pre-assembled package from a vendor, or assembled by the laboratory through the purchase of individual supplies.

- Columbia University Medical Center, Morningside Campus, and Nevis Laboratories are responsible for purchasing and maintaining additional spill kits if working with particularly hazardous substances such as formaldehyde, mercury, hydrofluoric acid, and radioactive materials.
- For a list of purchasing vendors, please see Appendix A.
- For recommendations on spill kit supplies, please visit Environmental Health & Safety’s (EH&S) website at www.ehs.columbia.edu, or contact EH&S at labsafety@columbia.edu.

4. Storage

Spill kits should be stored in an easy to access location, away from other chemicals and preferably not below sinks. All spill kit supplies should be assembled together in one area and clearly marked to restrict their use for spill response only. There should be one spill kit per floor space for each laboratory (i.e. if a PI has laboratory space on Floor 12 and Floor 14 of a building, spill kits should be available on each floor).

5. Maintenance

Laboratories should maintain their spill kits by restocking supplies once they have been depleted, and replacing items if they are expired, damaged, or compromised. Laboratories should establish a routine procedure to inventory spill kit supplies for replenishment and/or expiration needs. See Section H. – Recordkeeping, below.

F. Emergency Contacts

Emergency contact numbers vary by campus. Please visit www.ehs.columbia.edu/EmerProcedures.html for the most up-to-date emergency contacts.

G. Medical Surveillance

N/A

H. Recordkeeping

It is recommended all spill kit inventory and expiration dates be maintained through the use of a spreadsheet or database. Below is an example template for a spreadsheet.

<table>
<thead>
<tr>
<th>Spill Kit Item</th>
<th>Storage Location</th>
<th>Date Purchased</th>
<th>Expiration Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Calcium Gluconate Gel</td>
<td>Spill kit in room 513</td>
<td>10/5/2013</td>
<td>10/5/2014</td>
</tr>
</tbody>
</table>

Environmental Health & Safety
I. Appendices

1. Appendix A – Spill Kit Purchasing Suppliers

J. Forms

N/A

K. References


APPENDIX A

Spill Kit Purchasing Suppliers

- Lab Safety Supply (Grainger)
  www.grainger.com

- New Pig
  www.newpig.com

- Fisher Scientific
  www.fishersci.com

- VWR
  www.vwr.com

- Perkinelmer
  www.perkinelmer.com