



Université d'Ottawa | University of Ottawa

Health, Safety and Risk Management, Faculty of Science

Spill Response Procedures

Faculty of Science – University of Ottawa

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Acronyms

MSDS- Material Safety Data Sheets
WHMIS- Workplace Hazardous Materials Information System
HSRM- Health, Safety and Risk Management Team
ORM- Office of Risk Management
OHS- Occupational Health and Safety
NIOSH- National Institute of Occupational Safety and Health
CANUTEC- Canadian Transport Emergency Centre

Definition

The Ontario *Environmental Protection Act* (EPA) [Part X, section 91] defines a spill as:

“spill”, when used with reference to a pollutant, means a discharge,

- (a) into the natural environment,
- (b) from or out of a structure, vehicle or other container, and
- (c) that is abnormal in quality or quantity in light of all the circumstances of the discharge,

Tips on How to Prevent Spills

- Store glass bottles in cabinets when not in use
- Pick up glass solvent bottles with both hand and by the bottom, not by the loop at the neck
- Use plastic solvent carriers whenever transporting chemical-containing bottles
- Place liquid waste containers in chemical-resistant secondary containment that can contain a volume of 110% of a full liquid container
- Ensure waste containers have not degraded by verifying their due date; every two years, the Office of Risk Management (ORM) will exchange old containers for new ones.
- Have waste collected once it's generated
- Replace dangerous materials/equipment with safer substitutes. Here are a few examples:
 - Exchanging mercury thermometers with the Health Safety and Risk Management Team (HSRM) for alcohol thermometers
- Keep counters and floors clear of glass bottles

Spill Response-Roles and Responsibilities

Protection Services (ext. 5411) may be called at any time for help. They can be reached at extension 5411. The onus of responding to a spill lies with the individual whose action might have led to the spill. Chances are likely that the individual who has been working in that area will likely know more about the product than anyone else. If, however, the individual is not comfortable to handle the spill, they can call the [Health, Safety and Risk Management Team](#) for help. Depending on the size of the spill, lab personnel, the Principal Investigator or the Health, Safety and Risk Office will contact the Office of Risk Management (ORM) for assistance. The ORM team member will decide if the third party contractor must be called in for help.

If the Health, Safety and Risk Management Team are called for help during work hours, one of the members will help the individual by giving instructions, if required. The generator of the spill will be

cleaning the spill while the HSR Team member will be helping as the 'clean' person. If it is deemed necessary to call a third party, then help may be provided as required.

Regulations

When material that is volatile, toxic or hazardous for the environment is released, it is the responsibility of ORM to inform the regulatory bodies about the spill. The spill mitigation and disposal of any toxic or hazardous material must be done in accordance with federal, provincial and municipal regulations. Ontario has a comprehensive legislative and regulatory framework to ensure that hazardous material is managed in an environmentally safe manner. Through the *Environmental Protection Act* and accompanying regulations, the Ministry of the Environment has established a cradle to grave management system. This system controls collection, storage, transportation, treatment, recovery and disposal of hazardous waste.

Roles

When a spill occurs, several people may be contacted and it's important to understand what role each person will play in the mitigation of a spill:

Researcher

- Protect yourself
- Inform personnel present and in the vicinity of the spill
- Inform your supervisor
- Call Protection Services (ext. 5411)
- **Clean up the spill (if you are trained and comfortable to do so)**

Protection

- Control the zone/area
- Contact the ORM on-call person
- Remain on site to ensure security
- Provide first-aid or other help if needed
- **Not responsible for cleaning up the spill**

ORM

- Take control of the area and pass it to the Faculty if necessary/desired
- Assess spill and decide whether external contactor is required
- Decide whether the area is safe for continued use
- **Not responsible for cleaning up the spill**

Faculty of Science HSRM (if necessary/desired)

- Assess the risk associated with the spill
- Suggest ways for effective and safe cleaning
- **Not responsible for cleaning up the spill**

Emergency Equipment

Chemical spills can happen at any time and research laboratories are at a much higher risk of incidents in comparison to industrial plants. To ensure the safety of all the students and staff, there are several pieces of emergency equipment. The first line of defence is Protection (ext. 5411); they are available 24 hours a day, 7 days a week. They have first-aid certification and are trained to respond to emergency situations. Another way to alert Protection is by pushing the Panic Button found in each laboratory. For spills in the eyes or on the body, there are eye wash stations and emergency showers found on every floor and in most laboratories. Finally, to protect from fire, there are various types of fire extinguishers at the exits of every laboratory. Please make yourself familiar with the emergency equipment so that in an emergency situation, you can calmly and effectively use them.



Personal Protective Equipment (PPE)

Personal Protective Equipment (PPE) is important for your safety as you work and after a spill has occurred. PPE are only effective if they are properly fitted for the person and the incident. Here are a few tips on proper fitting and a list of the PPE that should be worn when cleaning a spill:

Lab Goggles

- Make sure lab goggles are adjusted so that the nose piece sits as high up on the nose as possible

Lab Coat

- Lab coats should be around knee length with long enough sleeves and snap button

Respiratory Protection

- Masks should cover the breathing area fully with minimal space in between the skin and mask
- As there are different sizes of masks, HSRM suggests [fit testing](#) every 2 years.

Gloves

- Glove size should be relatively tight and the material should be appropriate for the spill. See [glove guide](#) if you are unsure of the proper material for your chemicals

Size of Spill

Response to a spill will be dictated by the size of the spill. In general, minor spills can be dealt with by the university and major spills will be cleaned by an outside contractor. If the user is uncomfortable cleaning the spill themselves, inform Protection (ext. 5411) and follow the **How to Clean a Spill** procedures below.

A major spill is:

- Too large to be handled by the user/generator
- Volatile, toxic or hazardous for the environment
- Affects the health of staff, visitors or the environment

A minor spill is:

- Readily handled by a user/generator
- Not particularly volatile or toxic
- No widespread impact on staff, visitors or the environment

In the case of a major spill, time is of the essence to ensure the safety of all of the staff and visitors. Call Protection (ext. 5411) as soon as possible and evacuate all the people in the laboratory and the surrounding areas.

Types of Spills

There are various types of spills that require attention. This list includes:

- Gas leak
- Oil Spill
- Solid
- Liquid
- Biological
- Radioactive
- Mixed
- Unknown

No matter what type of spill is present, the first step is always informing people in the surrounding area. If the spill is a major spill, contact Protection (ext. 5411); they are responsible for securing the spill area and contacting the Office of Risk Management. For gas leaks, major oil spills and facility breakdowns, the ORM will work in conjunction with the Faculty of Science HSR and Facilities staff to address the issue.

For minor user generated solid or liquid spills, it is the responsibility of the user/researcher to clean the spill. If the user is unsure how to clean the spill or would like some advice on how to mitigate the spill, HSR can be contacted for information.

For a biological spill, please contact the [Biosafety Office](#) at the [Office of Risk Management](#).

For a radioactive spill, please contact the [Radiation Safety Office](#) at the [Office of Risk Management](#).

Please make every effort to identify a mixed or unknown spill. This information may greatly reduce the hazards involved in handling and classifying the material. Include the name of the research group, telephone number, type of research, storage method, approximate age of the container and all relevant information (i.e. organic, acid, air reactive, pH, oxidizer etc.).

Chemical Properties

The type of spill is important but the chemical properties of the spill can decide the type of cleaning that is necessary and how to safely deal with the spill. Whenever a spill occurs, the chemical properties may fall within these categories:

- Flammable
- Corrosive
- Reactive
- Toxic

Please inform all personals and response staff of the chemical properties of the spill when they arrive.

Spill Kits

The Office of Risk Management at the University of Ottawa provides spill kits for the research facilities. Like a fire extinguisher, these kits should be near an exit, free from obstruction and checked regularly. If the kit has been tampered with or the kit has been used, please contact HSR department at the Faculty of Science (x6425 or pbera@uottawa.ca). There are two types of spill kits: the yellow spill bags and the blue spill kits. The yellow spill bags can be found either hanging near an exit or in a black labeled pail are to be used for spills under 10L. The blue spills are found in the hallways and are to be used for larger spills. For any spill, if you have not received the training and are not comfortable to clean up the spill, contact HSR and the office will be able to assist.



The **yellow** spill kit contains:

- Granular absorbent
- Goggles (two pairs)
- Gloves (two pairs)
- Dustpan and brush
- Absorbent pads (10)
- Plastic bags for spill waste

The **blue** spill kit kept in hallways contains:

- Absorbent, 25 lb.
- Absorbent pads, 20
- Nitrile gloves, 4 pairs
- Splash goggles, 2 pairs
- Brush and dustpan
- Disposal bags, 4
- Procedures and label, 1 set



How to Clean a Spill

Minor spills are to be cleaned by the user. The user must ensure that they are wearing the proper PPE outlined above and clean the spill according to **Section 6: Accidental Release Measures** of the chemical's MSDS. For acid/base, flammable and mercury spills,

General Procedure

1. Protect yourself and ensure you are not in danger
 - a. Remove any contaminated clothing
 - b. Use an emergency eye wash station, in case the chemical has gone into your eyes.
 - c. Use an emergency shower if required
2. Inform personnel present in the vicinity
3. Inform your supervisor/Principal Investigator
4. Assess the spill to determine its size and potential danger
5. If you have received the training and are comfortable to clean up the spill, do so.
 - a. Please refer to the Material Safety Data Sheet (MSDS) or Safety Data Sheet (SDS).
 - b. Wear appropriate PPE
6. In cases of fire, medical or major spills, call Protection Services (ext. 5411) immediately
 - a. If possible, call Protection from a landline found near the spill so that the officers can trace the location;
7. Give Protection as much information as possible about the spill such as:

- a. Full Name
 - b. Supervisor's Name
 - c. Location of the spill including Building and Room Number
 - d. Injuries (if applicable)
 - e. Type of Spill
 - f. Size of Spill
 - g. Status of the spill and the mitigation methods
 - h. Odor
8. Evacuate the spill area and wait for Protection to arrive
 9. When Protection arrives, inform them of all the pertinent information including the chemicals involved and their potential dangers
 10. Once it is safe to enter, clean the spill
 - a. Clean the spill in accordance with Section 6 of the chemical's MSDS/SDS
 - b. Clean from outer to inner spill area
 - c. Collect contaminated articles using a brush and dust pan when applicable
 - d. A second individual should be outside the spill area while the first individual is cleaning the spill in case
 - e. Dispose of spill waste in a separate, clean container
 - f. Ensure that there is a waste label pasted to the waste container (example below)
 11. Contact HSR to dispose of the chemical waste
 12. Fill in an [incident report](#) within 48 hours of the spill

Acid/Base Spill

Acid/Base spills can be tricky considering their corrosive/caustic nature. To ensure a safe clean up, first neutralize the contaminated area:

- For an acid spill, sprinkle a generous amount of sodium bicarbonate or equivalent on the area
- For a base spill, sprinkle a generous amount of citric or ascorbic acid on the area
- Verify with pH paper before cleaning up the area

When the spill area has been properly neutralized, clean up the spill as outlined above and make sure to include the acidic/basic properties of the spill on the University of Ottawa hazardous waste label.

Hydrofluoric Acid (HF) Spill

While HF is non-flammable and not carcinogenic, it is extremely corrosive. It can corrode glass and if it comes into contact with skin, can burn the skin up to 24 hours after contact. For more information, consult the [Hydrofluoric Acid Guidelines](#).

If HF is spilled outside the fume hood or there is a large spill in the fume hood:

- Evacuate the area immediately and ensure that no one else enters the lab
- Contact Protection (ext. 5411) from a nearby land line if possible
- Continue with the general procedure above

If a small amount of HF is spilled in the fume hood and the laboratory staff understand the hazards and feel comfortable mitigating the spill:

- Ensure that the correct PPE is worn
- Sprinkle sodium bicarbonate or a spill absorbent specific for HF on the spill
 - DO NOT USE A NON-SPECIFIC SPILL KIT WHILE CLEANING THIS SPILL AS HF WILL REACT WITH THE SILICA TO PRODUCE A TOXIC GAS
- With a brush and dustpan, sweep the powder and place the powder into a plastic bag
- Dispose of the brush and dustpan in the bag and seal the bag
- Contact the HSR Team for disposal of the chemical waste

When the spill area has been properly cleaned as per the procedures above, make sure to include the presence of hydrofluoric acid on the University of Ottawa hazardous waste label.

Flammable Liquid Spill

Flammable liquid spills have the potential to be incredibly dangerous. First and foremost, if the user believes that the flammable liquid will catch fire, pull the fire alarm immediately.

For flammable liquid spills:

- Safely remove any source of ignition
- Increase ventilation through fume hoods by putting them on an emergency purge
- Open doors and windows if possible
- Re-enter only after sufficient ventilation has occurred

When the spill area has been properly cleaned as per the procedures above, make sure to include the flammable properties of the spill on the hazardous waste sticker.

Mercury Spill

Mercury is highly toxic and HSR encourages that all researchers find substitutes whenever possible. However, if a mercury spill occurs:

- Call Protection (ext. 5411) and inform them that there is a mercury spill
- Contact HSR for a Mercury Spill Kit for proper cleaning
- Consult the [MSDS for Mercury](#) for safe handling procedures and PPE

- Use a secondary container for the mercury waste
- Dispose of all disposable PPE, brushes, dust pans and all other cleaning material with the mercury waste

When the spill area has been properly cleaned as per the procedures above, make sure to include the presence of mercury on the hazardous waste sticker.

Resources

- [Faculty of Science Health and Safety Website](#)
 - [Glove Guide](#)
 - [Hazardous Waste Procedures](#)
 - [Hazardous Waste Form](#)
- [Office of Risk Management website](#)
 - [Biosafety Office](#)
 - [Radiation Safety Office](#)
 - [Incident Report](#)
- [Material Safety Data Sheet for Mercury](#)