

Hazardous Materials and Waste Management Procedure

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Office of the Chief Risk Officer

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Version Control Table

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1. Document Background

Purpose and scope of document

The Hazardous Material and Waste Management Procedure (hereafter known as “the procedure”) outlines the University of Ottawa (as also known as “uOttawa”) procedure for handling or working with hazardous materials and waste on uOttawa premises.

The procedure applies to uOttawa employees and also serves as a reference for stakeholders at uOttawa.

The procedure does not outline all the independent requirements and potential risks or challenges specific to any projects, workspaces, or situations, but rather is intended to serve as a framework to build a fit-for-purpose approach to manage the applicable risks.

Terms and definitions

Refer to the [OHS Glossary](#) for the OHS terms and definitions that apply to the documents within the management system.

Responsibilities

Responsibilities for several roles, including those of contractors students, supervisors and workers, are detailed in [Administrative Procedure 14-1](#) (Internal Responsibility Procedure for Health and Safety Issues).

Reference documents

- [General OHS Program Manual](#)
 - [Hazard Identification and Risk Assessment \(HIRA\) Procedure](#)
 - [OHS Incident Management Procedure](#)
- [Biosafety Program Manual](#)
- [Radiation Safety Program Manual](#)

2. Procedure

Careful management of hazardous materials, designated substances, and the associated waste is required to minimize the risk of injury and damage to individuals and the environment. Before working with materials and generating waste, all stakeholders must identify whether these items fall within the following definitions of hazardous materials and designated substances:

- **Hazardous materials/substances**
 - Hazardous substances include controlled products and chemical, biological, or physical agents which, by reason of a property of the agent, are hazardous to the safety or health of a person exposed to them
- **Designated substances**
 - Designated substances are those identified under the Designated Substances Regulation of the *Ontario Occupational Health and Safety Act*. There are 11 designated substances:
 - Acrylonitrile
 - Arsenic

- Asbestos
- Benzene
- Coke oven emissions
- Ethylene oxide
- Isocyanates
- Lead
- Mercury
- Silica
- Vinyl chloride

Procedural Steps

The following procedural steps **must be followed** when planning or performing work that involves hazardous materials:

1. Conduct a hazard identification and risk assessment (HIRA)
2. Procuring, transporting, and conducting an inventory of hazardous materials
3. Label, store, and handle hazardous materials
4. Handle and control hazardous material appropriately
5. Train and monitor individuals working with hazardous materials
6. Dispose of hazardous waste
7. Perform health and safety assurance activities

Additional steps may be required based on the scope of the project or work.

STEP 1 Conduct a hazard identification and risk assessment (HIRA)

Key activities

- Identify the work hazards present, including reviewing existing hazard identification and risk assessments (HIRA) and standard procedures in place
- If the hazard(s) of the specific work have not been previously assessed by completing a HIRA or equipment/activity specific procedure (that includes the outcome of a HIRA), conduct a HIRA with reference to the [Hazard Identification and Risk Assessment Procedure](#)
- Define appropriate measures to effectively eliminate or mitigate identified hazards and risks using the appropriate methodology
- Apply for safe work permits (where necessary)

Contextual Details

Hazard Identification and Risk Assessment (HIRA)

Supervisors of projects and workspaces within uOttawa premises shall identify and evaluate current and potential hazardous materials and waste at the site through a preliminary qualitative survey. The survey shall consult workers and relevant committee(s) to identify additional hazards that may be present.

Based on the findings of the preliminary hazard survey, identified hazardous materials and waste shall be addressed using the following:

1. Identify an existing assessment of the work hazard(s), reviewing the HIRA and associated standard procedure to mitigate the hazard risks.
2. If an assessment or standard procedure do not exist already, a HIRA must be conducted using the process outlined in the [Hazard Identification and Risk Assessment Procedure](#)

Faculties and services (including their workspaces on uOttawa premises) shall conduct a hazard identification and risk assessment with reference to the [Hazard Identification and Risk Assessment Procedure](#) to determine the hazard(s) and associated risk(s) for materials used, purchased, or brought into the workplace.

This includes hazardous materials that may be contained within equipment or machines purchased, leased, or rented. Assessments must be approved and include impact considerations such as:

- Environment
- Health
- Safety
- Fire
- Security impacts

The use and approval of hazardous materials must also consider the controls (e.g., spill response equipment, fume hoods and exhaust collection, physical barriers, personal protective equipment) that will be put in place to mitigate the potential impact during the handling, transport, use, storage, and disposal of the substance.

Any deficiencies in hazardous substance control that are identified through the initial and ongoing assessments shall be prioritized and appropriately addressed. Ongoing assessments shall be conducted at least once a year or whenever there is a major change to the scope of work.

The requirements of all hazardous materials controls that are identified during the assessment shall be documented and communicated to the appropriate parties. Documentation shall meet the requirements outlined in the [General OHS Program Manual](#).

Supervisors will approve the identification of activity-specific hazard controls that must be put in place prior to beginning any activity where a hazardous material and associated activity present a significant risk to University staff, students, or the public.

STEP 2 Procuring, transporting, and conducting an inventory of hazardous materials

Key activities

- Procure the hazardous materials necessary through uOttawa purchasing stores (considering less hazardous alternatives where possible)
- Utilize the chemical and materials inventory system (Vertére) to track the hazardous materials used, stored, and potentially procured, including tracking the potential waste streams of currently used and potentially procured substances
- Receive and ship hazardous materials in accordance with regulations

Contextual Details

Hazardous Materials Procurement and Inventory

To best comply with legislative requirements with respect to safety data sheets hazardous materials labelling and minimum inventories, personnel are asked to purchase hazardous materials through their respective purchasing stores (i.e., the Faculty of Science Store, Engineering Shipping/Receiving, the Visual Arts Store, the Faculty of Medicine Shipping/Receiving, etc.).

While not recommended, if an individual obtains hazardous materials directly (i.e., not through uOttawa) and brings such materials to the workplace, the hazardous products must meet the following requirements:

- They must be properly labelled according to WHMIS legislation (refer to Step 3)
- They must be inventoried (including barcoded) in the uOttawa chemical inventory
- A current safety data sheet (SDS) on the product must be available (either online or in print)
- Lab users must be trained on how to access the (SDS) within the lab (i.e., via paper copy or online) as well as the hazards of the product

When purchasing, or using substances, efforts shall be made to utilize non- or less-hazardous materials whenever possible.

Materials and substances shall be inventoried in the Vertère inventory system. The system is owned by OCRO but maintained by various organizational units, which includes procurement inventory updates through the Science Store and individual faculties.

Shipping and Receiving Hazardous Materials

Commercial carriers deliver hazardous materials to the University in accordance with the requirements of the *Transportation of Dangerous Goods Act* (TDGA) and its regulations. The University of Ottawa must only contract suppliers and carriers who hold valid licenses and are inspected as required by Transport Canada. Carriers are responsible for obtaining all the permits, licenses, and certificates of compliance required to transport such materials to and from uOttawa

Shipments must be properly identified and placarded. Shipping papers must be accessible and include information describing the substance, immediate health hazards, fire and explosion risks, immediate precautions, fire-fighting information, procedures for handling, procedures for leaks or spills, first aid measures, and emergency response telephone numbers.

It is important that hazardous materials be delivered to an area that is designed for proper storage. There are three main areas for shipping and receiving chemicals at the University; they are described in the table below.

Table 1: Shipping and Receiving Areas at uOttawa.

| Faculty of Sciences Stores | Faculty of Engineering | Faculty of Medicine |
|-----------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------|
| Contact: Purchasing and Science Store Manager 150 Louis Pasteur, Room 010 Ottawa, ON K1N 6N5 Fax: 613-562-5619 science.store@uOttawa.ca | Contact: Faculty of Engineering Shipping and Receiving 161 Louis Pasteur, Room E011 Ottawa, ON K1N 6N5 engship@uottawa.ca | Contact: Faculty of Medicine Senior Buyer Purchasing and Receiving Services 451 Smyth Rd, Ottawa, ON, K0A 1W0 medpurch@uottawa.ca |

Receivers must have received Transportation of Dangerous Goods (TDG) training and hazardous material containers shall not be accepted without accompanying labels, safety data sheets (SDS) and packaging in accordance with appropriate regulations.

Additionally, uOttawa personnel must affix a dedicated bar code to chemical containers upon receipt (in accordance with Step 3) and enter this information into the Vertère chemical inventory system.

Each carrier hired by uOttawa is required to develop and submit a spill prevention, control, and countermeasures plan to address the materials they bring to the University. In the event of a release during transport, or before official reception, the commercial transportation company is responsible for first response and cleanup. Any goods damaged during transport and identified upon receipt must be reported to Transport Canada.

Dispensing and Decanting Hazardous Materials

The preferred technique for chemical transfer at uOttawa is based on minimizing user exposure to chemicals and minimizing the risks for environmental spill. In order of effectiveness:

1. Designed engineering controls, such as bulk-fed delivery systems
2. Local engineering controls, such as an articulating arm with snorkel exhaust or fume hood
3. Having the employee pour chemicals by hand in a designated area while wearing PPE

The University of Ottawa allows for the transfer of chemicals by hand provided the following requirements are met:

- Hand-pouring of applicable hazardous materials or hazardous waste must be conducted in a standard chemical laboratory. It requires local exhaust, such as a fume hood or an articulating arm with snorkel exhaust and HEPA filter to minimize user exposures, odor issues and explosion risks
- No more than four litres (4L) of hazardous liquids may be hand-poured at a single time and the liquid must be dispensed to and from approved containers using appropriate decanting techniques (e.g., bonding and grounding, where applicable)
- If equipment requires more than 205L (i.e., a full drum) of a single chemical in a two-week period, it must be bulk supplied
- Supervisors must give job-specific training to users or personnel performing the hand-pouring task and written procedures shall be in place. The procedures shall include, at minimum, proper

use of PPE and detailed spill emergency and clean-up procedures in accordance with the chemical hazards present

- Hand-pouring/dispensing of hazardous materials or hazardous waste requires secondary containment such as spill trays or berms with sufficient capacity to accommodate overfills and must be done in an area without floor drains or potential discharge to the environment
- Spill clean-up supplies must be prepared according to the material(s) being transferred and must be available in the immediate work area

Note: Special circumstances that do not meet this specification must be authorized by the faculty management. Management must provide written consent that details the specific exception and the location and time limits for the transfer.

Hazardous Materials Transport

As part of the Hazardous Materials Technical Services Program, the Office of the Chief Risk Officer offers a service to transfer hazardous materials and hazardous waste between the main campuses of uOttawa. To request this service, [the user must complete an online request form](#). The service will be scheduled in the next available time slot (generally within two business days).

To request a transfer involving Science Stores, the requester must have the paperwork required (including delegation forms) prior to submitting a transfer request.

Students and staff are not permitted to transport hazardous materials on public roads. Refer to Appendix 1 for specific instructions on moving chemicals within campus (i.e., not using public streets).

STEP 3 Label and store hazardous materials

Key activities

- Identify storage requirements of hazardous materials/substances
- Store hazardous materials/substances in appropriate containers
- Label hazardous materials storage containers ensuring labels meet regulatory requirements and match their respective contents

Contextual Details

Hazardous Materials Storage

Storage requirements for hazardous materials/substances are stated on a hazardous material's Safety Data Sheet (SDS). Storage requirements listed in the most recent copy of the SDS must be met.

Certain hazard classes must be stored in specific storage equipment, such as flammable storage cabinets. Where specific storage equipment is required, ensure that it is properly used and is not modified in any way that affects its intended use.

For any additional questions regarding hazardous material storage, contact the supplier, Health Safety and Risk Manager, or OCRO.

Certain materials and substances may not be hazardous at the time of procurement but can become hazardous, unstable (e.g., formation of peroxides; rapid polymerization; shock sensitive materials and explosive hazards) or due to degradation, produce hazardous by-products after a given time. These materials are time-sensitive and must be monitored by the supervisor/PI. The environmental team also monitors the chemical inventory system for time-sensitive chemicals and notifies the affected laboratories when these chemicals are approaching their shelf life (approximately one month prior to expiry).

Hazardous Materials Labeling

In accordance with the Workplace Hazardous Materials Information System (WHMIS), substances that are purchased, used, stored, shipped, or disposed of in the workplace that meet the criteria to be classified as hazardous must be labelled. Detailed labelling guidelines are outlined in Appendix 2.

There are two main types of labels: supplier labels and workplace labels. Both are detailed in Appendix 2. A workplace label is required when:

- A hazardous product is produced (made) at the workplace and used in that workplace
- A hazardous product is decanted (e.g., transferred or poured) into another container, or
- A supplier label becomes lost or illegible (unreadable)

If the product is not used right away or if more than one person will be in control of the product, a full workplace label is required and can be created through ChemWatch.

Workplace labels will require the following information:

- Product name (matching the SDS product name)
- Safe handling precautions (may include pictograms or other supplier label information)
- A reference to the SDS (if available)

STEP 4 Handle and control hazardous materials and exposure

Key activities

- Control exposure to hazardous materials/substances
- Report any hazardous materials/substances spills or releases

Contextual Details

Hazardous Materials Exposure

If during the HIRA process a hazardous material/substance was identified as part of the scope of work, appropriate control measures must be applied to mitigate the potential impact of the substance. Hazardous substance exposure limits and potential controls are important to consider within this process.

Ontario Occupational Health and Safety Act Regulation 833 sets exposure limits for chemical and biological agents and must be followed when working with any hazardous materials/substances that are listed in the regulation, including those identified in the ACGIH Threshold Limit Values (TLVs). Additional regulation and manufacturer guidelines should be reviewed and considered prior to handling hazardous materials/substances.

Spills and Releases

If at any point hazardous materials/substances are spilled or released, the [OHS Incident Management Procedure](#) must be followed. Lab personnel, the Principal Investigator or the Health, Safety and Risk resource will report spills to Protection Services (ext. 5411), who may directly call a third-party contractor to assist with clean-up. OCRO is responsible for reporting hazardous materials/substances spills to appropriate regulatory bodies.

STEP 5 Train and monitor individuals working with hazardous materials

Key activities

- Verify that students and workers who are in contact with hazardous materials/substances have basic hazardous materials/substances training
- Ensure that students and workers who use advanced hazardous materials storage and/or manipulation equipment are trained in the correct operation and use of the equipment
- Conduct the monitoring and surveillance as necessary

Contextual Details

Training

The *Ontario Occupational Health and Safety (OHS) Act* states that:

- An employer shall provide information, instruction, and supervision to a worker to protect the health or safety of the worker
- An employer shall ensure that a worker exposed or likely to be exposed to a hazardous material or to a hazardous physical agent receives, and that the worker participates in, such instruction and training as may be prescribed

In accordance with the *Ontario OHS Act*, uOttawa shall provide applicable training to users for the work they will conduct before they are allowed to access laboratory spaces. Individuals working in a lab shall refer to the [General OHS Program Manual](#) and [Lab Safety Program Manual](#), including the [Lab Training Framework](#) to identify specific training requirements. If individuals are working with radioactive and/or biological materials, they shall refer to the [Radiation Safety Program Manual](#) and the [Biosafety Program Manual](#).

The [OHS Incident Management Procedure](#) provides spill response and incident management information.

Monitoring and Surveillance

Monitoring and surveillance may be necessary where HIRA has identified that:

- Individuals will handle hazardous materials or substances
- Individuals may be exposed to hazardous materials or substances in excess of specified exposure limits (as set out in *Occupation Health and Safety Act* Regulation 833)

The University of Ottawa will monitor and place those employees under a medical surveillance program to ensure that their health has not been directly affected due to their handling of, or exposure to, hazardous materials. Contact the Health and Wellness Office for detailed information on medical surveillance and monitoring. Medical surveillance and associated procedures are also described in the [Biosafety Program Manual](#) and [Radiation and Laser Safety Program Manual](#).

STEP 6 Dispose of hazardous waste

Key activities

- Classify waste for disposal based on Appendix 3
- Store and label waste appropriately
- Dispose of hazardous waste using appropriate disposal methods
- Contact OCRO to ensure tracking and documentation of waste disposal is complete

Contextual Details

Selecting the correct disposal method begins with the classification of hazardous waste. Regulatory definitions of hazardous waste and examples of common hazardous waste streams at the University are included in Appendix 3 for reference. Waste is classified by the generator prior to transport and disposal. An example of a waste manifest is included in Appendix 4.

Documentation of hazardous waste disposal must be completed through the appropriate [forms](#).

For additional waste classification resources, contact the Faculty Health and Safety Risk Manager or OCRO. Radioactive and biological material waste should reference the [Radiation Safety Manual](#) and [Biosafety Manual](#), respectively.

Waste Storage

Hazardous waste materials must be collected in a suitable waste storage container. [The appropriate containers are available by request](#). Appropriate containers are detailed in the table below but can also be further discussed with the HSRM/OCRO and respective faculties.

Table 2. List of appropriate waste containers for disposal of hazardous materials.

| Application | Description | Size |
|--------------|--------------------------------|------|
| Liquid Waste | a. Amber glass bottle - Reuse | 1L |
| | b. Amber glass bottle - Reused | 4L |
| | c. White plastic carboy | 20L |
| | d. Plastic waste drum 2 | 200L |

| Application | Description | Size |
|-------------|----------------------------------|------|
| Solid Waste | e. Black reusable plastic pail | 10L |
| | f. White single use plastic pail | 20L |
| | g. Metal waste drum 2 | 200L |
| | h. Chemical Sharps Container | 1L |

Incompatible, highly reactive, and highly toxic materials must always be packaged separately to minimize fire and explosion hazards and to ensure proper handling procedures by the Hazardous Materials Technician (see Appendix 1).

Each waste container must only have one type of waste material inside. Chemical, biohazardous, and radioactive wastes are handled differently and shall not be stored together.

Twenty (20) liter containers are to be placed inside a larger, secondary container to prevent spillage when stored outside of flammable or acid cabinets. Containers shall not be filled above the hashed line; this is to prevent spills when the container is being emptied. Concentrated (>10M) acids should not be disposed of until they are diluted to appropriate levels (<6M) to prevent unexpected and uncontrolled heating of the solution and secondary reactions. The maximum fill line on the secondary containers must be respected to prevent hazardous waste leaks.

Waste containers shall be loosely sealed to prevent pressure build-up while limiting exposure and spillage of hazardous waste.

Waste Labeling

Each container must be properly labelled to reduce the possibility of mixing incompatible materials.

Hazardous waste labels are required to inform laboratory researchers and Facilities services of the waste container’s contents. The following steps ensure proper labeling and safe handling and collection of hazardous waste:

- Prior to collecting waste in a new container, immediately attach a “Déchet Dangereux / Hazardous Waste” label to the container
- Collect inorganic substances separately and do not mix solids with liquids (common waste streams are listed in Appendix 3)
- Include the material name under “Contenu / Contents”, name of the research group, telephone number, and relevant information (i.e. organic, acid, air reactive, pH, oxidizer etc.). Refer to the [label illustration in Module 4 of WHMIS training, section 4.12](#)

Every reasonable effort should be made to identify a waste before submitting it as an “unknown waste” for disposal.

Waste Disposal and Pickup

Disposal of any toxic or hazardous material must be in accordance with federal, provincial, and municipal regulations. Ontario has a comprehensive legislative and regulatory framework to ensure that hazardous wastes are managed in an environmentally safe manner. Through the *Environmental Protection Act* and accompanying regulations, the Ministry of the Environment, Conservation and Parks has established a cradle-to-grave management system.

To request waste collection, please submit a completed [Chemical Waste Pick Up Request Form](#).

Contact the HSRM/OCRO for waste removal, such as for laboratory clean-up, or for removal of potentially high-risk material, unknown materials, and used hazardous spill bags. The PI/supervisor shall be informed of such communication. For laboratory decommissioning, refer to the [Laboratory Decommissioning Procedure](#).

STEP 7 Perform health and safety assurance activities

Key activities

- Verify that students and workers have current training records on an annual basis
- Complete equipment inspections on an annual basis
- Review SDSs on an annual basis to ensure they are current

Contextual Details

The employer must perform assurance activities to ensure the continued health and safety of employees, students, and the public.

Assurance activities that relate to hazardous materials include:

- Reviewing employee training records on an annual basis to ensure that employee training is up to date and has not lapsed
- Inspecting hazardous materials equipment (including but not limited to: hazardous materials storage, secondary containment, personal protective equipment, spill equipment, monitoring equipment and emergency response equipment)
- Reviewing SDS sheets on an annual basis to ensure the most current substance information is available to employees and students

Inspections should be captured and documented using inspection forms. Documentation must meet the requirements outlined in the [General OHS Program Manual](#).

Appendix 1: Hazardous Materials Transport Guidance

Moving chemicals within campus without using public streets

1. Perform a pre-move visual inspection and inventory of the hazardous materials that will be moved. Know and understand the properties of the hazardous materials you move and use
 - Make a list of the hazardous materials and note the type (e.g., acid, base, reactive, toxic) and quantity of the hazardous materials to be moved
 - Make sure that each container is correctly labeled
 - Observe the general condition of each container
 - Observe each container's cap or closure seal for the formation of crystals.
 - CAUTION: Do not touch, tighten, open, or move containers that have crystals forming on the caps and seals
 - If possible, observe whether crystals, which could be the signs of decomposition, have formed INSIDE the container. **Ethers and other classes of organic peroxides can decompose and produce potentially dangerous and explosive crystals**
2. Locate and review the Safety Data Sheet (SDS) for each hazardous material to be moved. Each SDS has chemical specific handling and safety information that must be properly followed to move the hazardous material safely
3. Plan the move. Choose the best route to take from point A to point B. Do not take containers up or down stairs, if possible
4. Prepare the hazardous materials for the move
 - Remember to use the proper protective equipment, which may include (but is not limited to) goggles and gloves before handling any hazardous materials
 - Group the containers for the move by Hazard Class. Conduct a separate move for each Hazard Class
 - Transfer salvageable hazardous materials from deteriorating or contaminated containers to new containers with new labels
 - Liquid chemicals require the use of a secondary container during transport: if a cart is used, the container must have a lip to prevent overflow onto the floor
 - Box hazardous material containers if possible, using the correct packing material (e.g., vermiculite, original packaging boxes)
 - Properly dispose of unsalvageable and excess hazardous materials as hazardous waste
 - If you use a cart to move containers make sure containers can be secured properly. Place heavy containers on the bottom rack of the cart. Do not overload the cart; make several trips if necessary
 - If a spill in a public setting occurs, contact Protection Services immediately to close off the area
 - Make sure to cover any floor drains identified on the route
5. During the move:
 - Stay with the containers at all times. Do not let them out of sight while moving them between point A and point B

- Be aware of your surroundings. Watch for doors opening in your way. Warn people of the hazard before they get close to you
- Any spill occurring in a public hallway is considered a major spill and requires you to contact Protection Services

Transporting compressed gas cylinders

Special notes regarding compressed cylinders

- Always remove regulators from the cylinders before moving
- Always replace the protective valve cover on the cylinder before moving it
- Move the cylinder with a cylinder dolly made especially for moving cylinders. Make sure the cylinder is securely chained or strapped to the dolly
- **DO NOT** lay cylinders on their sides.

Appendix 2: Hazardous Materials Labelling Guidance

Example of a Workplace Label

Labels must contain the product identifier, safe handling instructions, and a reference to the Safety Data Sheet (SDS). Users must be able to understand the information provided. An example of a simple workplace label is given below. **Note that additional information such as a hatched border, hazard symbols, risk phrases, and protective equipment symbols may optionally appear on the workplace label but are not required.**



Figure 1 - WHMIS workplace label example

Example of a Supplier Label

Supplier labels deliver the relevant information needed to keep everyone safe. The label is one of the first things that is noticeable. The label is a warning that the container contains a hazardous product. The supplier label shall contain the following information:

1. **Product identifier** – the brand name, chemical name, common name, generic name or trade name of the hazardous product.
2. **Initial supplier identifier** – the name, address and telephone number of either the Canadian manufacturer or the Canadian importer*.
3. **Pictogram(s)** – hazard symbol within a red square set on one of its points (diamond).
4. **Signal word** – a word used to alert the reader to a potential hazard and to indicate the severity of the hazard.
5. **Hazard statement(s)** – standardized phrases that describe the nature of the hazard posed by a hazardous product.
6. **Precautionary statement(s)** – standardized phrases that describe measures to be taken to minimize or prevent adverse effects resulting from exposure to a hazardous product or resulting from improper handling or storage of a hazardous product.
7. **Supplemental label information** – some supplemental label information is required based on the classification of the product. For example, the label for a mixture containing ingredients with unknown toxicity in amounts greater than or equal to 1% must include a statement indicating the percent of the ingredient or ingredients with unknown toxicity. Labels may also include

supplementary information about precautionary actions, hazards not yet included in the Global Harmonized System (GHS), physical state, or route of exposure. This information must not contradict or detract from the standardized information.

Exceptions:

1. Containers of volumes < 100ml (or equivalent size container of solid) require the name of the product, information on the safe handling of the product, and a reference to an SDS.
2. Supplies from the Science Store may be labeled with a workplace label.
3. Laboratory samples (e.g., products that result from a synthesis process, analytical standard solutions and solutions prepared for teaching laboratories or products created in the laboratory for research and development purposes) are **sometimes** exempt from workplace labelling requirements. If the product **remains in the lab**, then neither a workplace label nor a SDS is required. Instead, a combination of identification and education enables laboratory workers to identify the product and obtain information for the safe use, storage and handling of the product. This is accomplished through WHMIS training and the use of consistent identification for products used in a laboratory. Laboratory supervisors will inform employees of the identification standards in their work areas.



Figure 2 – WHMIS supplier label example

Transportation of Dangerous Goods (TDG) Labels

Hazardous materials and hazardous waste safety marks must be displayed on the means of containment of such materials during transport. Hazardous materials and hazardous waste safety marks include labels, placards, numbers, letters, abbreviations and words used to identify dangerous goods and to show the nature of the danger they pose.

Safety marks give a quick identification of the nature of the material involved in the event of an emergency, such as an accident or an accidental release.

Safety marks are also an awareness tool for people involved in transportation, including but not limited to: truck drivers, loading dock personnel, hazardous waste contractors, shipping/receiving personnel, etc.

Generally, labels are displayed on small means of containment and placards are displayed on large means of containment. Transportation of Dangerous Goods (TDG) regulations mandate that labels be placed on small containers and placards placed on tanks and trailers. These labels and placards must clearly explain the hazard presented by the containerized material.

Transportation of Dangerous Goods (TDG) Placards

The TDG hazard classification system is based on the United Nations (UN) hazard classes.



Figure 3 - TDG hazard classification system labelling

- UN identification number
- UN hazard class number
- Hazard symbol
- Colour of placard

The four-digit UN Identification Number identifies the hazardous material name, which may refer to more than one chemical, and is found on the centre of the placard. The UN ID number is also included on the manifest or shipping papers.

The UN Hazard Class Number is located on the bottom of the diamond and indicates the type or class of hazard. These numbers and their corresponding hazards are listed below:

| UN Hazard Class Number and Description | |
|-----------------------------------------------|---------------------------------------------------------------------------------------|
| 1 | Class A, B, C, explosives |
| 2 | Non-flammable and flammable compressed gases |
| 3 | Flammable liquids |
| 4 | Flammable solids, spontaneously combustible substances, and water reactive substances |
| 5 | Oxidizing materials, including organic peroxides |
| 6 | Class A and B poisons, irritants, and disease-causing agents |
| 7 | Radioactive materials |
| 8 | Corrosive materials |
| 9 | Miscellaneous hazardous materials not covered by any other classes |

The hazard symbols indicate a visual warning of the hazard by the hazardous material and the colour helps to identify the hazard.

| Colour | Hazard |
|--------------------------------|-------------------|
| White | Poisonous |
| Yellow | Reactive |
| Orange | Explosive |
| Red | Flammable |
| White and Black | Corrosive |
| White and Red Vertical Stripes | Flammable solid |
| Two Colours | Two major hazards |

Other types of labels used at uOttawa

There are several other labels that personnel should be aware of and may come across at uOttawa. These are detailed in the [workplace signage package](#), as well as below:

1. Hazardous waste labels are used to identify hazardous waste storage containers. The label must identify the type of waste in the container, the source of the waste (i.e., room number and building) and a contact number in case of emergency.



Figure 4 - Hazardous and radioactive waste labels

2. Pipe identification labels are used to colour code pipelines carrying various types of materials (i.e., natural gas, compressed air, nitrogen, ammonia, fire protection equipment, etc.), the most common of which are listed in the table below. On campus, the large feeder pipes are predominantly underground; however, labeling can be seen on the natural gas and nitrogen

lines that feed laboratories. If a problem occurs in one of these pipelines, personnel must be able to identify the level of hazard present based on the pipe colour.

| Classification | Colour | Example |
|---------------------------|---------------|----------------------------------------------------------------------------------------|
| Dangerous materials | Yellow | Ignitable, toxic, corrosive, explosives, electrical conduit |
| Safe materials | Green | Non-toxic, non-explosive, non-flammable or low pressure/temperature |
| Protective materials | Blue | Materials that are available to prevent or minimize the hazards of dangerous materials |
| Fire protection equipment | Red | Sprinkler systems and other fire fighting equipment |

Appendix 3: Common Hazardous Waste Streams

Liquid Chemical Wastes

1. Organic Waste

- Purely organic solvents
- Organic halogenated solvents
- Organic compounds
- Organic acids and bases

2. Aqueous Waste

- Ionic salts
- Solutions where the main solvent is not water
- Inorganic acidic waste
- High concentration of water liquid waste
- Bleach waste
- Some forms of heavy metals

3. Oil Waste

- Vacuum pump oil waste
- Motor oil waste

4. Photo Processing Waste

- Photo developer waste
- Photo fixer waste
- Silver containing compound waste

5. Highly Toxic Inorganic Liquid Compounds

- Dimethyl mercury
- Heavy Metal waste

6. Pyrophoric Waste

- Must be in sealed container. Original container is accepted; under certain conditions an appropriate secondary container may be accepted

Solid Hazardous Wastes

1. Hazardous Solid Waste - Silica, Tips, Tubes, Stain and Contaminated Articles

- Amorphous silica waste
- Gloves
- Paper tissue
- Non-highly toxic organic and inorganic compounds
- Inorganic salts
- RNA kit waste
- Contaminated gel plates

2. Broken Glass

- Ensure that glass is rinsed before placing it in the broken glass cardboard box. Rinsate(s) must also be disposed of in the appropriate liquid waste container.
- Once the box is full, seal the box and label it as broken glass and place it in the hallway for overnight pickup. A new empty box lined with a plastic bag will be placed in your laboratory

3. Highly Toxic Waste

- Inorganic compounds (thallium, mercury, chromium, etc.)

4. Ethidium Bromide Gels

- Ethidium bromide
- Articles contaminated with ethidium bromide

5. Small Gas Cylinder Waste

- Lecture bottles
- High purity pyrophoric containers

6. Pyrophoric Waste

- Must be in sealed container. Original container is acceptable; under certain conditions an appropriate secondary container may be accepted

7. Chemical Sharp Waste

- Must be in appropriate sealed sharps container

8. Battery Recycling

- To be placed in the white collection container on the side of the recycling stations throughout campus

Biological Waste

1. Autoclave Waste

- Contact the faculty's autoclave facility to arrange for appropriate autoclave waste procedures

2. Biological Sharps

- Must be in appropriate sealed sharps container
- Biohazardous sharps containers are [available free of charge on request](#).

3. Anatomical waste

- Contact the [biosafety specialist](#) to arrange for appropriate Stericycle waste procedures

Radioactive Waste

- Contact the [radiation safety specialist](#) to arrange for appropriate radioactive waste procedures