The University of British Columbia
Department of Health, Safety and Environment

# Hazardous Laboratory Waste Disposal Manual

**April 2006**
**Environmental Services Facility**

# Table of Contents



## Hazardous Laboratory Waste Disposal Procedures

## Appendices

# Introduction

This manual has been prepared by the UBC Department of Health, Safety and Environment (HSE) to provide information on the proper methods for the disposal of hazardous waste. Improper disposal of hazardous wastes can be harmful to the environment and humans. The disposal of hazardous waste is also governed by strict local, provincial, and federal regulations. It is important to follow the procedures as stated in order to avoid legal repercussions.

This manual and its Hazardous Laboratory Waste Disposal Procedures can also be downloaded from the HSE website (www.hse.ubc.ca). The manual and procedures can be found under the "Procedures" link. (Note: Adobe Reader will be required.)

HSE operates the Environmental Services Facility (ESF) which manages and handles the hazardous waste generated by UBC core research, education and operational activities. The facility will safely manage hazardous waste in accordance with local, provincial and federal regulations. For more information, please contact the Environmental Programs Officer (EPO) at (604) 822-9280.

# Disclaimer

This manual is intended for use by those who produce hazardous waste as a result of their work at the University of British Columbia. The material contained in this manual is correct to the best of knowledge of the UBC Department of Health, Safety and Environment. The disposal procedures are compliant with applicable local, provincial and federal legislation.

Updates to procedures are made occasionally. If you have procedures older than two years, please check with HSE for the most current update.

# Health, Safety and Environment Contacts

| | | |
|---|---|---|
| Edward Lee | Environmental Programs Officer | (604) 822-9280 |
| Bang Dang | Technician, Environmental Services Facility | (604) 822-1285 |
| Ivan Leversage | Technician, Environmental Services Facility | (604) 822-6306 |
| John El-Baghdady | Technician, Environmental Services Facility | (604) 827-5389 |
| Andy Trinh | Technician, Environmental Services Facility | (604) 822-1281 |
| Bruce Anderson | Biosafety Officer | (604) 822-7596 |
| Donna Ashick | Environmental Audit Officer | (604) 822-8762 |
| David Bell | Occupational Hygiene Officer | (604) 822-2643 |
| Ted Sedgwick | Radiation Safety Officer | (604) 822-7052 |

# Environmental Services Facility

IMPORTANT NOTE: There are some wastes that are outside of ESF's mandate or cannot be accepted because of the restrictions in its operating permit. The cost of disposal for these wastes must be borne by the generator.

ESF cannot manage or handle the following, and therefore, this procedure does not include:

- Unknown solid or liquid chemicals (please refer to "Disposal of Unknown Chemicals" procedure 06.01.09.R02, May 2005, for further instructions);
- Toxic gases;
- Explosives; and,
- Radioactive chemicals (please refer to "Radioactive Solid Waste Disposal" procedure 06.01.02.R03, May 2005 for further instructions

## Permissible Generators

The ESF can only handle and manage wastes which originate only from generators and independent companies affiliated with UBC activities.

All waste generators are required to apply to the ESF for its official waste generator status. Approved waste generators will be assigned a waste generator number that is to be associated with all shipments of waste originating from their respective sections.

## Acceptable Waste Types

General waste classifications permitted at the facility are as follows:

Class 2 – Gases
- Class 2.1 – Flammable Gas

Class 3 – Flammable and Combustible Liquids

Class 4
- Class 4.1 – Flammable Solid
- Class 4.2 – Spontaneously Combustible
- Class 4.3 – Dangerous When Wet

Class 5 – Oxidizing Substances
- Class 5.1 – Oxidizer
- Class 5.2 – Organic Peroxide

Class 6 – Poisonous (toxic) substances and infectious substances
- Class 6.1 – Toxic
- Class 6.2 – Infectious

Class 8 – Corrosive substances

Class 9 – Miscellaneous products

## General Waste Procedures

All wastes sent to the facility must be accompanied by waste identification information. If you have any questions, please contact an ESF Technician at 822-1285 or 822-6306.

a. **Flammable Liquids**: All movement of solvent wastes must be accompanied by serialized Flammable Liquids Disposal tag attached to each container. The generator barcode sticker must be affixed to the tag and the waste composition completed.

b. **Waste Chemicals**: All shipments of chemical wastes must be accompanied by a completed Chemical Waste Inventory Form. This inventory must identify the generator, their location, phone number and the chemicals to be disposed.

c. **Biohazardous Waste:** All movement of biological materials must be accompanied by a serialized Biological Waste Disposal tag attached to each bag. The generator barcode sticker must be affixed to the tag and the waste composition completed.

d. **Radioactive Waste:** All radioactive material must be accounted for on an approved inventory form that can be acquired from the UBC Radiation Safety Office (RSO). The disposal option is determined by the radioisotope activity.

## Solvent Recovery

Solvent wastes that are acceptable at the facility for recovery include: xylene, methanol, and acetone. Prior to waste solvents being sent for recovery, segregation procedures must be set up with the solvent recovery technician to ensure waste streams are compatible for recovery. Contact the ESF Technician ((604) 822-1285) for more information.

## Hazardous Waste Pickup

ESF picks up hazardous waste throughout UBC on a scheduled basis. Pickups are scheduled Monday to Thursday. Each building has a designated area for hazardous waste storage and pickup location. These areas should be secure (such as locked rooms or cages).

Most buildings are on a schedule for routine collection. If you are unsure as to whether your building is on this schedule or if you require special pick-up, contact the Environmental Services Facility at (604) 822-1285, (604) 822-6306 or (604) 827-5389.

# Special Note to Non-Core UBC Waste Generators

Environmental Services Facility (ESF) also offers these disposal services to waste generators that are not UBC departments or faculties, but who are located on the Point Grey Campus, or are tenants of UBC property.

Hazardous waste disposal for non-UBC waste generators will be charged as per the prices on the following page. The invoice will also include a charge for transportation, chemist and manifest. For an accurate quote, a complete chemical inventory must be faxed to ESF. Due to the nature of the environmental services industry and factors beyond our control, prices may be subject to change without notice.

For more information on the disposal, recycling, treatment or exchange of your biohazardous, biomedical and hazardous waste, please contact an ESF Technician at (604) 822-1285 or (604) 822-6306 at the Environmental Services Facility.

# UBC Environmental Services Facility

## Price List for Non-Core UBC Waste Generators

(Effective: May 2005)

| Hazardous Waste Disposal | Price $ |
|---|---|
| Class 1 – Explosives | By Quote |
| Class 2 – Gases | |
| Class 2.1 – Aerosols, Flammable | $75 / lab pack (20 litre pail) |
| Class 3 – Flammable Liquids | |
| Solvents (Methanol, Xylene, Acetone) | $2.36 / litre |
| Class 4.1 – Flammable Solids * | $104.5 / lab pack (20 litre pail) |
| Class 4.2 – Spontaneously Combustible * | $115.00 / lab pack (20 litre pail) |
| Class 4.3 – Dangerous When Wet * | $115.00 / lab pack (20 litre pail) |
| Class 5.1 – Non-Chlorinated Oxidizer * | $135.00 / lab pack (20 litre pail) |
| Class 5.2 – Organic Peroxide * | $8.80 / kg |
| Class 6.1 – Toxic * | $75/ lab pack (20 litre pail) |
| Class 6.2 – Pesticides * | $6.00 / kg |
| Class 7 – Radioactive | By Quote |
| Class 8 – Corrosive | |
| Class 8 – Acid | $65 / lab pack (20 litre pail) |
| Class 8 – Base | $65 / lab pack (20 litre pail) |
| Class 8 – Mercury | $20 / kg |
| Class 9 – Environmentally Hazardous * | $75 / lab pack (20 litre pail) |

| Biohazardous Waste Disposal | Price $ |
|---|---|
| Risk Group 1 | $1.47 / kg |
| Risk Group 2 | $1.47 / kg |
| Pathological (Anatomical Animal) Waste | $1.00 / kg |

| Biomedical Waste Disposal | Price $ |
|---|---|
| Biomedical (Human anatomical, cytotoxics) | $6.33 / kg |
| Primate Anatomical | $6.33 / kg |
| Sharps and Needle Waste | $1.47 / kg |

| Other | Price $ |
|---|---|
| Batteries: | |
| - Lithium | $14.50 / kg |
| - Mercury | $13.25 / kg |
| - Alkaline, NiCad, Wet/Dry | $5.00 / kg |
| - Sealed lead acid | $1.00 / kg |
| Waste oils (Non-PCB): | |
| - Pump Oil | $120.00 / 205 litre drum |
| - Cutting Oil | $190.00 / 205 litre drum |
| - Petroleum/motor oil | $120.00 / 205 litre drum |
| - Oil-Contaminated Solids | $2.58 / kg |

| Chemist and Transportation Charges | Price $ |
|---|---|
| ESF Field Chemist | $65.00 / hr |
| Special Waste Manifest | $20.00 / manifest |
| Pickup and Transportation | $40.00 / hr |

**NOTE**: * Because of the variability of chemicals, these prices are estimates only and will be quoted upon receipt of completed Chemical Waste Inventory. Please call (604) 822-1285 or (604) 822-9280 for further inquires.

# Emergency Information

## Emergency Numbers

### UBC Campus

Fire, Police, Ambulance . . . . . 911
First Aid (staff & faculty). . . . . (604) 822-4444
UBC Hazardous Materials (HAZMAT) Response. . . . . ….911
Campus Security . . . . . .(604) 822-2222
Plant Operations Trouble Calls . . . . . .(604) 822-2173
UBC Hospital Emergency Department . . . . . .(604) 822-7222

### Common Numbers

UBC Health, Safety and Environment . . . . . (604) 822-2029
Poison Control . . . . . .(604) 682-5050
Vancouver Fire Department (Non-emergency) . . . . . .(604) 665-6010
R.C.M.P. Non-emergency. . . . . (604) 224-1322
UBC Biosafety Office . . . . . .(604) 822-7596
UBC Emergency Planning Office . . . . . .(604) 822-1237
UBC Personal Security Coordinator . . . . . .(604) 822-6210
UBC Radiation Safety Office . . . . . .(604) 822-7052
UBC Chemical Safety Office . . . . . (604) 822-5909
UBC Occupational Hygiene Office . . . . . (604) 822-2643

Ensure all relevant emergency information (such as: nature of emergency, building name and address, phone number, and exact location of the emergency in the building) is provided to the operator before hanging up.

Situations requiring immediate emergency response may include:

- First aid emergency;
- Hazardous materials spill;
- Bomb threat;
- Fire;
- Civil demonstration; and
- Natural disaster (such as earthquake, flood).

In the event of an emergency, contact the appropriate response agency (using phone numbers from this manual) and initiate response activities if it is safe to do so.

## Emergency Preparedness

Because emergencies, accidents, and various other problems happen without warning, it is essential that all supervisors and employees are prepared for the unexpected. Each individual is responsible for knowing their role in an emergency, and each organization or department must ensure that all employees have received proper training. UBC Safety Policy requires compliance with all relevant legislation. For emergencies, each area or department should have:

- A Safety Committee;
- A Fire Safety Plan (posted);
- An Emergency Evacuation Plan (posted);
- A designated Emergency Assembly Area;
- A Fire Safety Director and Floor Wardens for each floor or area; and
- A local first aid attendant.

Emergency preparedness activities may include emergency preparedness and response training, stockpiling of emergency supplies, practice of building evacuation drills, and/or development and testing of emergency plans. All individuals are encouraged to have personal emergency supplies on hand to sustain their needs for up to 72 hours in the event of a disaster. Emergency supply kits may be purchased pre-packaged at safety stores, or can be assembled from household supplies or goods purchased individually.

Each building or area at UBC must have a Fire Safety Plan. This plan provides a detailed description of all procedures specific to the building or area to be followed in the event of a fire. The Fire Safety Plan includes detailed floor plans, a list of Fire Safety Officers and their responsibilities, procedures for fire drills and evacuations, specific actions for fires, bomb threats and earthquakes, the BC Fire Code and fire extinguisher operation instructions.

## Evacuation

Evacuation may be necessary under a variety of circumstances, including fire, hazardous material spill, bomb threat or earthquake. If the fire alarm is sounded, or occupants are told to leave the building, it is important that all occupants stay calm and evacuate immediately. Equipment should be shut down and hazardous materials secured where safely possible. All occupants must exit the building according to instructions given by emergency personnel, giving aid to those with disabilities. Do not use elevators. Once outside, with all evacuated personnel gathered at the designated Assembly Area, take a head count, ensuring all personnel are accounted for. No

personnel may re-enter the building until emergency personnel have established that it is safe to do so.

## Emergency Response Procedures

There are many resources available through the UBC Department of Health, Safety & Environment that detail specific actions for a variety of emergencies.

- The "Emergency Procedures & Information" flipbook summarizes several emergency situations and how to deal with them;
- The UBC Safety Program Manual details emergency and first aid procedures, including a section on special first aid procedures for bodily contact with dangerous and potentially deadly chemicals;
- The UBC Emergency Planning Office has generic Fire Safety Plan templates available to create tailored emergency plans for each worksite or department; and,
- Emergency response and preparedness training is offered through the UBC Emergency Planning Office. In addition, information on emergency supplies and disaster kits is available through the Emergency Planning Office ((604) 822-1237) or the Disaster Preparedness Resource Centre ((604) 822-5518).

The following is only a brief overview of emergency response procedures:

### Fire

As soon as a fire is discovered, sound the alarm, call 911 and evacuate the area. Close doors to isolate the fire. Attempt to extinguish the fire with a fire extinguisher only if it is safe to do so. If the fire alarm sounds, all occupants must immediately follow the fire evacuation procedure (outlined in Evacuation and the Fire Safety Plan). If trapped in a room by fire or smoke, place damp cloths around and under the door, retreat from the fire and signal from a window. Do not open the window unless absolutely necessary. If caught in a smoky room, stay below the smoke (kneeling or crawling), breathe slowly and stay calm.

### Earthquake

**a) Before** - Individuals should prepare to be self-sufficient for at least three days. It is recommended that individuals stockpile adequate emergency supplies and store them at individual workstations. Heavy

objects, sharp items, large hanging plants, and other items that could easily fall should be removed or well secured. Practice emergency procedures and participate in training sessions as necessary.

**b) During** - Avoid hazards by moving away from windows and potential falling objects. Do not leave the building. Take cover under a desk or any other sturdy object. If outdoors, move away from buildings, trees and power lines.

**c) After** - Wait until shaking has stopped. Assess damage to immediate area. Evacuate if necessary (e.g., major structural damage, fire, gas leaks, etc.). Give first aid to injured persons and alert emergency personnel. Gather emergency supplies together and assess needs. Initiate Emergency Plan as necessary.

## Hazardous Material Spills

Refer to Material Safety Data Sheets, located at every work site, before handling any hazardous materials.

If a chemical, biohazardous material or radioactive material is spilled, evacuate and isolate the area immediately. Call 911 and be ready to provide all relevant information.

Contact Campus Security and ask them to contact HSE.

Contact the Provincial Emergency Program at 1-800-663-3456 if the spill is reportable as defined by Environmental Reporting Procedures. If there is a gas leak, do not pull the fire alarm as it could cause an explosion. Call 911, shut down equipment and evacuate the building, closing all doors.

Refer to Appendix J: Environmental Reporting Procedures.

## First Aid Emergency

In the event of a First Aid Emergency for staff or faculty, call (604) 822-4444 or the local First Aid Attendant for immediate assistance. If the injured person is a UBC student, call 911. Ensure that the person has an open airway, is breathing and has a pulse. If necessary, initiate first aid procedures (abdominal thrusts, rescue breathing, CPR, etc). Control bleeding and treat other first aid injuries as necessary.

## Bomb Threat

If a bomb threat is received by telephone, it is essential to get as much information as possible. Keep the person on the line as long as possible and do not upset the caller. Be courteous and receptive, and ask questions about the nature of the bomb. Take notes on everything the caller says, and when he or she has hung up, call the RCMP at 911

immediately. Do not touch any unfamiliar objects or packages, and report anything suspicious. Follow instructions of RCMP and evacuate if necessary.

# Frequently Asked Questions

***1. What types of waste does Environmental Services Facility handle?***

ESF only disposes of the hazardous wastes produced by registered waste generators. Non-hazardous wastes (such as garbage, glass, scrap metal and wood, packaging, etc.) are handled by UBC Waste Management at (604) 822-3827. Procedures for the wastes that ESF can manage are included in this manual. If you have any questions, please contact the Environmental Programs Officer ((604) 822-9280) or the ESF Technician ((604) 822-1285).

***2. What is a barcode sticker and how do I get one?***

A barcode sticker is a self stick label (with dimensions about 1 by 2 inches) that must be affixed to the UBC Waste Generator Tag on each container of waste sent to ESF. The barcode allows ESF to identify the Hazardous Waste Generators for waste tracking and legal purposes. Without the barcode sticker affixed to the Generator Tag, ESF may refuse collection and disposal of hazardous waste. In order to register as a UBC Hazardous Waste Generator and receive barcode stickers, tags, or waste containers, contact an ESF Technician at (604) 827-5389 or (604) 822-6306.

***3. How should I dispose of pharmaceutical drug waste?***

ESF does handle pharmaceutical drug waste as per the requirements of Disposal of Laboratory Chemicals procedure in this manual (Reference 06.01.03.R03).

***4. What should I do with empty solvent bottles?***

The bottles should be triple rinsed (as per government regulations) and then disposed of as regular glass waste. If you need any more information, please contact Waste Management at (604) 822-3827.

***5. What should I do with liquid phenol-contaminated waste?***

If you need to dispose of phenol-contaminated glass waste, you must triple rinse the glass carefully with an organic solvent and dispose of the glass as regular glass waste. However, the rinsate must be put into a solvent waste can and disposed of as an organic solvent according to the procedure outlined in this manual (Organic Solvent Recovery and Disposal, Reference 06.01.05.R02, June 2005).

If you need to dispose of another material that has been contaminated with phenol, contact an ESF Technician at (604) 822-6306.

### *6. What are the procedures governing the storage of propane tanks?*

The procedures regarding the:

- storage, handling, transportation and transfer of propane;
- installation of appliances, equipment, components, accessories and containers when propane is to be used for fuel purposes; and
- installation of containers and equipment to be used for propane in distribution locations, filling plants, and on tank trucks, tank trailers, and cargo liners

are outlined in the UBC's "Procedures for the Use of Compressed Gas Cylinders in UBC Laboratories" and the Canadian Gas Association Propane Installation Code, Standards Council of Canada, 1995.

For information on how to dispose of empty propane tanks, please refer to "Propane and Butane Cylinder Disposal Procedure (Reference 06.01.16.R01) or, call an ESF Technician at (604) 822-6306.

### *7. Can I send "roadkill" to ESF for disposal?*

No, please contact Plant Ops (Tariq Din at (604) 822-1327) to arrange for pickup.

UBC
Health, Safety
& Environment

| Hazardous Waste Disposal Procedures – ***Biohazardous Waste Disposal*** | | |
|---|---|---|
| *Reference:* ***06.01.01.R03*** | *Date:* ***June 2005*** | *Page: 1 of 4* |

## Scope

This procedure applies to biohazardous agents in Risk Groups 1 and 2, which may include the following components:

1. Cultured animal cells and the potentially infectious agents these cells may contain;
2. Micro-organisms including Bacteria, Viruses, Fungi, Rickettsiae and Chlamydiae;
3. Parasites;
4. Allergens;
5. Extracted tissues from experimental animals including animal dander;
6. Plant viruses, bacteria and fungi;
7. Toxins (bacterial or plant); and,
8. Pathological Waste (referred to at UBC as animals or animal tissue in whole or in part).

With the exception of pathological waste, materials that have come in contact with the above agents may also be considered biohazardous.

This procedure **DOES NOT** apply to the disposal of ***biomedical waste***, which consists of human anatomical parts, or human blood and body fluid and Risk Group 4 agents, as defined in the Laboratory Biosafety Guidelines, 2nd Edition 1996, published by Health Canada. Refer to the "Biomedical Waste Disposal" procedure, reference number 06.01.12.R02, June 2005, UBC Department of Health, Safety and Environment.

## Purpose

This procedure specifies the safe and proper disposal of the biohazardous materials classified above, in accordance to federal and municipal guidelines.

## Background

1. In contrast to chemical agents, infectious biological agents have the ability to replicate, thus giving rise to the potential of large populations in nature when small numbers may be the norm.
2. Unlike chemicals, where "safe" levels are often allowed to be released into the environment, there is no "safe" level of a non-contained pathogenic organism.
3. This procedure follows the guidelines set by the Laboratory Biosafety Guidelines, 4th Edition 2001, published by the Dept of Health , Safety and Environment.
4. Refer to UBC Health Safety and Environment, Laboratory Biosafety Reference Manual, 4th Edition, 2001 for further details on definitions, procedures and management of biohazardous materials and Risk Group

classifications (or contact the Biosafety Officer at (604) 822-7596).

5. Disposal of untreated biohazardous waste to landfills is prohibited by the BC Hazardous Waste Regulations, 2004 and the GVRD Landfill bylaws No. 181 and 183, 2000.
6. The transportation of untreated biohazardous materials is regulated by Section 5 of the Environmental Management Act, 2003, and by the Transportation of Dangerous Goods Regulations, 2002.
7. **In general, biohazardous organisms MUST be rendered harmless by autoclaving before being released into the environment.**

## Procedure

***IMPORTANT NOTE: Due to the health and safety of the workers handling waste in this procedure, labelling and packaging requirements are strictly enforced. If the bags are not prepared as specified, Environmental Services Facility reserves the right to refuse collection of the waste. In the event that a shipment is not suitable, all attempts will be made to contact the generator from the information provided on the Biological Waste Disposal Tag.***

**Please Note:**

1. Laboratory waste that is NOT biohazardous, as defined in this procedure, can be disposed of in the regular garbage.
2. Proper segregation of biohazardous versus non-biohazardous waste is essential in reducing the volume and the cost of handling biohazardous waste.
3. Please ***do not include*** the following items in the biohazardous waste stream, which requires autoclaving.
   - Wrappers and packaging material from laboratory supplies
   - Plastics and Labware that have not come into contact with biohazardous agents, as defined in the scope of this procedure.
4. Polyvinyl Chloride (PVC) materials produce hydrogen chloride during degradation that may be harmful to the environment. ***It is highly recommended that substitutes for PVC products be used at all times.***

## Waste Containing Risk Group 1 Agents

Risk Group 1 Agents are considered by Health Canada to be of **low individual and community risk (If you have any questions, please contact the Biosafety Officer at (604) 822-7596).**

1. All Risk Group 1 waste ***MUST*** be contained in **CLEAR and UNLABELLED** autoclave bags. Bags ***MUST NOT*** be marked with any biohazardous warning symbols or warning labels. The bags **MUST** then be autoclaved sufficiently to render the organism in question harmless. Autoclaved bags **MUST** be leak proof. To prevent leaks and breakage during storage or transportation, double bagging with a clear plastic bag is required.
2. Each bag ***must not*** weigh more than 10 kg.
3. Do not put glass or sharps in with Risk Group 1 waste.
4. After autoclaving, bags must be tagged with the UBC Environmental Services **Biological Waste Disposal tag (Red)** (as shown in Appendix A). Affix your waste generator number sticker where indicated. On the tag, check the box marked "**Autoclaved Risk Group 1**" and place it in the building's designated area for pick-up by ESF. (Contact the ESF Technician at (604) 827-5389 if you require any of these supplies).

## Waste Containing Risk Group 2 Agents

Risk Group 2 Agents are considered by Health Canada to be of **moderate individual and limited community risk. (If you have any questions, please contact the Biosafety Officer at (604) 822-7596).**

1. All Risk Group 2 waste ***MUST*** be contained in **ORANGE** autoclave bags (Bags may be purchased from any laboratory supplies vendor). The bags **MUST** then be autoclaved sufficiently to render the organism in question harmless. Autoclaved bags must be leak proof. To prevent leaks and breakage during storage or transportation, double bagging with a clear plastic bag is required.
2. ESF must be able to package the red bag into a box (length – 22", height – 22", width – 22") from our disposal supplier. Therefore, the maximum size of the bags must be smaller than the aforementioned box dimensions.
3. Each bag must not weigh more than 10 kg.
4. Do not put glass or sharps in with Risk Group 2 waste.
5. After autoclaving, bags must be tagged with the UBC Environmental Services **Biological Waste Disposal tag (Red)** (as shown in Appendix A), Affix your waste generator number sticker where indicated. On the tag, check the box marked "**Autoclaved Risk Group 2**" and place it in the building's designated area for pick-up by ESF. (Contact the ESF Technician at (604) 827-5389 if

you require any of these supplies).

## Pathological (Anatomical Animal) Waste

1. Collect Anatomical Animal Waste in a black polypropylene bag (6 mm thick, *40 cm x 40 cm* - available through Plant Operation Stores). **All tubing, catheters, plastic clips, tags, etc. must be removed from the animal before packaging.**
2. Each bag must not weigh more than 10 kg.
3. Bags ***MUST*** be tagged with the UBC Environmental Services **Biological Waste Disposal tag (Red)** (as shown in Appendix A). Affix your waste generator number sticker where indicated. On the tag, check the box marked "**Anatomical Animals**" and place it in the building's designated area for pick-up by ESF. (Contact the ESF Technician at 827-5389 you require any of these supplies).
4. Bagged materials must be stored in a freezer (or coldroom at minimum) for pick-up by Environmental Services.

## Attachment

**Appendix A: Biological Waste Disposal – Tag (Red)**
**Appendix B: Biological Waste Disposal - Poster**

## Revisions

**R03:**

- Updates to recent legislation
- Bags can be purchased from various suppliers
- Bags must not exceed 10 kg
- Included phone number of ESF Technician 4

**R02:**

- New disposal tag (See Appendix A)
- Risk Group 1 and Risk Group 2 agents need to be segregated.
- Bags to contain Risk Group 1 agents changed to clear, unlabelled bag
- Sharps procedure removed from this procedure and is now a procedure of its own (See Sharps Disposal, 06.01.15 R01).

UBC
Health, Safety
& Environment

# Hazardous Waste Disposal Procedures – *Radioactive Waste Disposal*

| Reference: **06.01.02.R03** | Date: **June 2005** | Page: 1 of 5 |
|---|---|---|

**Note: Please refer to the Radiation Safety Office homepage for updated procedures at:**

**http://www.hse.ubc.ca/inner.php?scid=20&pid=0**

## Scope

This procedure applies to the disposal of solid and biohazardous/anatomical waste that has been used in research involving radioactive materials. For further information, please contact the UBC Radiation Safety Office at (604) 822-7052.

## Purpose

This procedure specifies the requirements for disposal of solid and biohazardous/anatomical waste that has been used with radioactive materials, such that UBC is in compliance with all legislation and pertinent regulations.

## Background

Researchers using radioisotopes are required to ensure that the waste generated is disposed of in a very specific manner, meeting very specific disposal criteria pursuant to the Nuclear Safety and Control Act (2000). The Canadian Nuclear Safety Commission issues the University of British Columbia a consolidated license that outlines the activity levels that are to be met when disposing solids into the waste stream at UBC. These levels are specific to each radioisotope and are outlined in Table 6 of the UBC Radionuclide Safety and Methodology Reference Manual which can be viewed at:
http://www.safety.ubc.ca/inner.php?scid=20&pid=56 (See Table 1 below).

## Procedure

1. First, ensure that all radioactive material is accounted for on an approved inventory form that can be acquired from the UBC Radiation Safety Office (RSO). If the radioisotope activity used prior to the initiation of the experiment already meets the disposal criteria, then the laboratory staff will immediately take the waste to the dumpster for disposal. This is not the job of housekeeping staff. If the activity level exceeds the disposal limit but has a short half-life (< 90 days), the waste is held for decay over 10 half-lives (marked with a "Low Activity Waste" form) or until the acceptable disposal criteria is met (make note of what room the waste is being held in for decay). The waste is then removed from the decay area to the dumpster as above.

2. Waste that contains long-lived isotope and has activity levels greater than the disposal criteria is placed in new paint cans. Once the paint cans are full, the laboratory calls the Radiation Safety Office to arrange to have the cans temporarily stored prior to shipment to Chalk River Ontario where they are subsequently buried at an authorized disposal facility.

3. Research that uses animals in combination with radioisotopes with short half-lives follows the procedures above in 1, except that waste being held for decay will be held in a freezer and the final disposal step will require the researcher to remove the waste as per appropriate biohazardous waste disposal procedures.

4. Animal research using radioisotopes with long half-lives (i.e. H-3 and C-14) requires that the radioisotope activity being used per animal at the beginning of an experiment does not exceed the solid waste disposal criteria (activity/kg), therefore ensuring that the waste created can be discarded through the regular biohazard/anatomical waste stream. Thus, the activity/kg limit for the specific radioisotope being used must be known before the experiment initiates. In other words, the maximum activity to be used in animals is set by the acceptable disposal limits (i.e. C-14 and H-3 limits in animals are 370 kBq/Kg = 10 uCi/kg and 3700 kBq/kg = 100 uCi/kg respectively). Please refer to Table 6 of the Radionuclide Safety and Methodology Manual for the allowable disposal activity limits for specific isotopes at UBC. Further information can be found at the link above in 1. (See Table 1 below).

**(Note: If the researcher needs to use an activity greater than the specific disposal limit, they must first get permission from the Radiation Safety Office).**

**IMPORTANT NOTE**

In addition to the activity requirement, the waste must also measure < 2.5uSv/hr at the surface of the waste container as measured with a survey meter. The combination of these two requirements is called the "release limits" of the specific radioisotope and must be met prior to disposal of any radioactive waste on the UBC campus. If either of these two requirements is not met, the waste may not be disposed of at that time.

## Attachments

**Appendix H - UBC Isotope Inventory Control Sheet**

http://www.safety.ubc.ca/rad/Manual/Inventory.pdf

**Appendix I - UBC Low Activity Waste for Decay Form**

http://www.safety.ubc.ca/rad/Manual/LAWForm.PDF

# TABLE 1
## Excerpt from Table 6 of the UBC Radionuclide Safety and Methodology Reference Manual

| Isotope | Disposal Limits | |
|---|---|---|
| | Solid Activity/kg | |
| | kBq/kg | µCi/kg |
| H-3 | 3,700 | 100 |
| C-14 | 370 | 10 |
| Na-22 | 37 | 1 |
| P-32 | 37 | 1 |
| P-33 | 37 | 1 |
| S-35 | 37 | 1 |
| Ca-45 | 37 | 1 |
| Cr-51 | 37 | 1 |
| I-125 | 3.7 | 0.1 |

## In Summary:

| | **Radioactive Waste** | **Biohazard Waste with Radioisotope** |
|---|---|---|
| **Low-Activity, Short half-life (<90 days)** | Decay if required to acceptable disposal level. Once at the disposal level, waste is removed by laboratory staff directly to the dumpster for the building they are working in (This is NOT the responsibility of housekeeping staff. | Decay if required in a freezer to the acceptable disposal level for the radioisotope used. Once the disposal level is reached, waste is removed following appropriate Biohazardous Waste procedures[1]. |
| **Low Activity, long half-life** | Only waste that already meets the acceptable disposal levels in Table 6 falls into this category. The waste may be disposed of into the solid waste stream and is removed to the dumpster by laboratory staff. | Experiments using animals must NOT use isotopes in this category that exceed the acceptable disposal limits. Waste is disposed of following appropriate Biohazardous Waste procedures[1]. |
| **High Activity, short half-life (<90 days)** | Waste is held for decay (10 half-lives typically) or until the acceptable disposal level is reached. Once the disposal level is reached, waste is removed by laboratory staff directly to the dumpster for the building they are working in (This is NOT the responsibility of housekeeping staff. | Waste is held for decay in a freezer (10 half-lives typically) or until the acceptable disposal level is reached. Waste is then disposed of following appropriate Biohazardous Waste procedures[1]. |
| **High Activity, long half-life** | Waste is placed in a new paint can with appropriate shielding. When the paint can is full, arrangements are made with the Radiation Safety Office to have the paint can(s) shipped to Chalk River, Ontario for disposal at an approved disposal facility. | Experiments DO NOT proceed without the approval of the Radiation Safety Office. |

[1] Procedures for biohazardous waste disposal can be obtained from the Biosafety Office at (604) 822-7596. For biohazardous/anatomical waste (such as animal carcasses) a "Biohazardous Waste Disposal Tag" must be obtained from the Environmental Services Facility (ESF) @ (604) 822-1285 or (604) 827-5389. Do not include items such as disposable gloves, paper towels, bench covers, etc., with your shipment of animal waste.

## Additional Administrative Requirements

1. The purchasing system must be updated to acknowledge receipt of isotope orders.
   http://www.safety.ubc.ca/rad/purchasing/login.asp

2. All radioactive material must be accounted in the laboratory's inventory on an approved **Radioisotope Data Sheet** that can be downloaded from the Radiation Safety Office web site at:
   http://www.safety.ubc.ca/rad/Manual/Inventory.pdf

This form aids researchers in keeping track of all isotopes being used in their laboratory from cradle to grave (receipt to disposal).

3. **Low Activity Waste for Decay** forms must be attached to all radioactive waste being held for decay. PLEASE ensure that the disposal date is clearly written and easily visible. Create a system in the laboratory that ensures that the waste is PROMPTLY removed from the decay area on the day the waste is scheduled to be disposed of. These forms can be downloaded from the Radiation Safety Office web site at:

   http://www.safety.ubc.ca/rad/Manual/LAWForm.PDF

UBC
Health, Safety
& Environment

**Hazardous Waste Disposal Procedures –**
# *Disposal of Laboratory Chemicals*

| Reference: ***06.01.03.R03*** | Date: ***June 2005*** | Page: *1 of 2* |
|---|---|---|

## Scope

This disposal procedure applies to hazardous laboratory chemicals in the solid or liquid form, which can be managed by the Environmental Services Facility. Hazardous laboratory chemicals may include the following:

- Waste Containing Polycyclic Aromatic Hydrocarbons;
- Flammable Liquids;
- Spontaneously Combustible;
- Dangerous When Wet;
- Oxidizer;
- Waste Batteries;
- Poisonous Substances – Toxic
- Infectious Substances;
- Corrosives;
- Misc Dangerous Goods;
- Environmentally Hazardous Substance;
- Waste Containing Tetrachloroethylene;
- Waste Oil;
- Waste Pest Control Products; and,
- Leachable Toxic Waste.

## Purpose

This procedure ensures that chemicals are identified according to their chemical hazards and compatibilities, then packaged safely for transportation to the Environmental Services Facility.

## Background

1. Chemical packaging class determinations were taken from the Federal Labpack guidelines and adapted to UBC in the Environmental Services Facility procedure "Chemical Labpacking".
2. Chemicals are classified as hazardous or nonhazardous according to the BC Hazardous Waste Regulations, 2004.
3. Disposal of hazardous chemicals in the sewer or landfill is prohibited by GVRD Sewer Use Bylaw 164, 2002, and by BC Hazardous Waste Regulations, 2004.

## Procedure

***IMPORTANT NOTE: ESF cannot manage or handle the following, and therefore, this procedure does not include:***

- ***Unknown solid or liquid chemicals (please refer to "Disposal of Unknown Chemicals" procedure 06.01.09.R02, May 2005, for further instructions);***
- ***Explosives; Toxic Gases; and,***
- ***Radioactive chemicals (please refer to "Radioactive Solid Waste Disposal" procedure 06.01.02.R03, June 2005).***

***ESF reserves the right to refuse handling of improperly packaged and unidentified chemicals.***

1. All chemicals for disposal must be listed on a Chemical Waste Inventory Form. Clearly identify all material with proper chemical names. No abbreviations please. Forms are available from ESF by contacting the Environmental Technician at (604) 822-6306 or (604) 822-1285. Please refer to Appendix C for an example.
2. Ensure that the generator information is filled in completely.
3. Send the completed inventory form to ESF for approval by campus mail or fax ((604) 827-5807). Contact the ESF technician (at (604) 822-6306 or (604) 822-1285) if you have any questions.
4. ESF will process your request and send back your form with the chemicals coded according to classification and chemical compatibility.
5. After the coded form has been returned, package chemicals in strong cardboard boxes according to the chemical codes, where only chemicals with the same code are packed in the same box. Package all the chemicals as per their code.
6. The weight of each box of chemicals must not exceed 10 kg.
7. Once the box is full, secure the bottles with appropriate packing material to prevent breakage and tape the box closed to prevent chemicals from spilling or falling out during transportation.
8. With a felt-tipped pen, write on top of each box the generator's name, department, telephone number and correct chemical classification code on the top of the box in large letters. Then tape an envelope with one copy of the coded inventory forms on top of one of the boxes. The inventory form must include all chemicals that are in the boxes.
9. Place the boxes in the building's designated area for pickup by ESF.

## Attachment

**Appendix C: Chemical Waste Inventory Form**

## Revisions

**R03:**

- Updates to recent legislation
- Included phone number of ESF Technician 4

**R02:**

- Grammatical changes

UBC
Health, Safety
& Environment

# Hazardous Waste Disposal Procedures – Ethidium Bromide Waste Disposal

| Reference: **06.01.04.R03** | Date: **June 2005** | Page: 1 of 3 |
|---|---|---|

## Scope

The following procedure describes waste disposal and treatment for solid ethidium bromide in gels and ethidium bromide solutions.

## Purpose

Ethidium bromide is considered a mutagen and must be neutralized and/or disposed of properly.

## Background

**Ethidium Bromide Gel Waste (gels and gloves, gauze, etc.)**

The procedure for disposal of these materials has changed since the university no longer incinerates ethidium bromide contaminated solid waste at the Environmental Services Facility. If you have any comments or suggestions please contact the Environmental Programs Officer at (604) 822-9280 or ESF technicians at (604) 822-6306 or (604) 822-1285.

**Ethidium Bromide Solutions**

This material is mutagenic and must be handled with care. One of the following methods listed below must be followed to treat the waste prior to safe sewer disposal.

## Procedure

### 1.0 Contaminated Solid Waste

Collect contaminated solid waste in a thick plastic garbage bag, ensuring that there is no liquid waste present, and then double-bag the material. Each bag must not exceed 10 kg. Package the double bagged material into a cardboard box, affix an Biological Waste Disposal Tag (Red) (as shown in Appendix A) with the generator bar code sticker attached, and check off the "Cytotoxics" box. Place the packaged material in the building's designated area for pickup by ESF.

### 2.0 Contaminated Liquid Waste

There are three methods for disposing of liquid ethidium bromide waste. **IMPORTANT NOTE**: Liquid waste contaminated with ethidium bromide ***must not*** be sent to ESF.

**Method 1**[1,2]

An aqueous solution is diluted to less than 0.5 mg/ml ethidium bromide. For each 100 ml of diluted aqueous solution, add 20 ml of 5% hypophosphorous acid (made by diluting commercially available 50%, 1:10) and 12 ml of 0.5M sodium nitrate. Stir briefly to mix and leave it to stand for 20 hours. Finally, neutralize with sodium bicarbonate before discarding.

If the ethidium bromide is in an organic solvent like isopropanol, for each volume of ethidium bromide add 4 volumes of a decontaminating solution (e.g., 4.2 gm sodium nitrate, 20 ml hypophosphorous acid (50%) in 300 ml $H_20$). Stir for 20 hours. Neutralize with sodium bicarbonate before discarding. The

solution should now be ready for safe sewer disposal.

**[1] Lund & Sansone, Anal. Biochem. 162:453-458, 1987.**
**[2] Dr. G. Spiegelman, Waste Watchers (HSE at UBC), vol 1, #1, p.3, June 1994**

If the ethidium bromide is in butanol the same decontaminating solution which was used for isopropanol can also be used, but this time stir for 72 hours. Then add 2 gm activated charcoal for each 100 ml, stir for 30 minutes, and filter. Again neutralize with sodium bicarbonate; separate the layers and discard. The solution should now be ready for safe sewer disposal. **Remember that the activated charcoal is now a hazardous waste, see above Section 1.0, Contaminated Solid Waste.**

**Method 2**

Very dilute solutions of ethidium bromide can be destroyed by treatment with household bleach. To convert ethidium bromide to the physiologically inactive product 2-carboxybenzophenone stir the ethidium bromide solution with household bleach for 2 hours. For a solution containing 0.5 mg/ml of ethidium bromide use 440 ml of bleach for each 100 ml of solution. The solution should now be ready for safe sewer disposal.

**Method 3**

Filters can be used to extract ethidium bromide and other fluorescent dyes from aqueous solutions. Pour dilute solutions of ethidium bromide into the filter system, and turn the vacuum on. The ethidium bromide solution filters through the cartridge and the hazardous molecules are permanently trapped in the reusable cartridge. The filtered liquid can then be safely disposed of down the drain. When saturated, cap and dispose of the used cartridge and place a new filter into the system.

The used cartridge is still highly **contaminated** and will need to be further treated as contaminated solid waste. Refer to, Section 1.0 Contaminated Solid Waste, for steps on how to properly dispose of used cartridges.

One type of filter is BondEx Ethidium Bromide & SYBR Green Detoxification Cartridges, for more information about this particular filter, contact Clontech Laboratories at 1-800-662-2566.

It has been shown[3] that when ethidium bromide solutions of these dilute concentrations are used, the product solution does not show excess mutagenicity over standards in the Ames test.

**[3] Hazardous Waste Minimization in the Academic Laboratory, Dr.M. Armour, Networking News, ACS, Sept 94, vol.8 #2, p.5.**

For further information, please contact the Environmental Programs Officer ((604)

822-9280), Department of Health, Safety and Environment.

## Attachment

**Appendix A: Biological Waste Disposal – Tag (Red)**

## Revisions

**R03:**

- Removed: extension to continue to incinerate ethidium bromide at ESF.
- Updates to recent legislation.
- Liquid waste must not be sent to ESF.
- Added in Tech 4's phone number.

**R02:**

- Revision in Contaminated Liquid Waste procedure due to the addition of method 3, which incorporates the use of a filter system.

**R01:**

- Updated procedure.

UBC
Health, Safety
& Environment

| *Hazardous Waste Disposal Procedures –* **Organic Solvent Recovery and Disposal** | | |
|---|---|---|
| *Reference:* ***06.01.05.R03*** | *Date:* ***June 2005*** | *Page: 1 of 2* |

## Scope

This procedure specifies the handling of organic solvent for reuse through the Solvent Recovery Program and for disposal through the Environmental Services Facility (ESF). Applicable solvents may be classified as CLASS 3 FLAMMABLE LIQUIDS or CLASS 6 TOXIC SUBSTANCES by the Canada Transportation of Dangerous Goods Regulations, 2002.

## Purpose

Most organic solvents are flammable and toxic. Waste solvents must be contained and segregated properly for recovery and disposal such that they do not pose a safety hazard during transportation or storage.

## Background

1. Organic solvents may be a CLASS 3 FLAMMABLE LIQUID or CLASS 6 TOXIC SUBSTANCE, as defined by the BC Hazardous Waste Regulation, 2004.
2. GVRD Sewer Use Bylaw 164, 2002 prohibits the disposal of organic solvents in the sewer or landfill.
3. Solvents suitable for recovery can be recycled at the ESF for reuse. For more information, contact the Environmental Services Technician at (604) 822-1285.

## Procedure

# 1.0 Organic Solvents for Recovery

ESF can redistill acetone, methanol and xylene solvents for reuse. UBC's solvent recovery program operates spinning band distillation units, which can provide labs with re-distilled solvents of high purity (Purity analysis is provided). For more information on the Solvent Recovery Program, call (604) 822-1285.

**Handling Procedures**

1. Segregate and collect each solvent in its own UBC waste solvent containers, typically these are plastic red "Jerry" cans.
2. **Segregate!** Do not mix two different solvents together.
3. Use only containers that have been used for the same solvent stream.
4. Do not mix oil with solvents.
5. **Do not** pour sludge, grit, paper, inorganic chemicals, or aqueous solutions into the waste solvent.
6. Complete the required information and affix the generator bar code to the Solvents - Recovery (Green) tag (as shown in Appendix D). Give a brief history of the solvent. Identify all contaminants.
7. Affix the tags to the appropriate containers.
8. Tighten all caps before shipping.

9. Place the containers in the building's designated area for pickup by ESF.

## 2.0 Organic Solvents For Disposal

*Non-Halogenated Organic Solvents*
*Halogenated Organic Solvents*

***Handling Procedures***

1. Segregate and collect only non-halogenated solvents in UBC non-halogenated waste solvent containers. Segregate and collect only halogenated solvents in UBC halogenated waste solvent containers.
2. Halogenated and non-halogenated solvents must be collected in separate containers and must not be mixed together.
3. Do not mix oil with the waste solvents.
4. Do not pour acid, sludge, grit, glass, plastic, paper, inorganic chemicals, or aqueous solutions into the waste solvents.
5. Complete the required information and affix the generator bar code to the Flammable Liquid Disposal Tag (Blue) (as shown in Appendix E). Give a brief history of the solvent. Identify/classify all material in the containers.
6. Affix the tags to the appropriate containers.
7. Tighten all caps before shipping.
8. Place the containers in the building's designated are for pickup by ESF.

## Attachments

**Appendix D: Solvent – Recovery Tag (Green)**

**Appendix E: Flammable Liquid Disposal Tag (Blue)**

## Revisions

**R03:**

- Updates to recent legislation.
- Removed halogenated and non-halogenated solvents.
- Toxic aqueous solutions are treated as chemical waste.
- Added in phone numbers for both ESF Technician 4 and 5.

**R02:**

- Grammatical changes.

**R01:**

- Updated procedure

UBC
Health, Safety
& Environment

# Hazardous Waste Disposal Procedures – *Photochemical Wastes Disposal*

| Reference: ***06.01.06.R03*** | Date: ***June 2005*** | Page: *1 of 1* |
|---|---|---|

## Scope

This disposal procedure applies to waste solutions of photochemical fixer, stabilizer and developer.

## Purpose

This procedure ensures that photochemical wastes are segregated and stored properly so that silver can be recovered from the fixer.

## Background

1. Disposal of photochemical waste without treatment in the sewer or landfill is prohibited by GVRD Sewer Use Bylaw No. 164, 2002 and BC Hazardous Waste Regulations 2004.
2. Photochemical waste solutions are classed as "Corrosive" and may contain levels of silver in excess of BC Hazardous Waste Regulations, 2004.

## Procedure

1. Collect photochemical wastes in a dedicated 5 or 20 litre **red** container which has only contained photochemicals as provided by the Environmental Services Facility (ESF). To obtain these containers, please call (604) 822-1285 or (604) 822-6306. Photochemicals contaminated with trace amounts of solvents will damage the photochemical recovery columns.
2. Separate containers must be used for FIXER and DEVELOPER.
3. ***Do not mix solvents with photochemical waste.***
4. When containers are full, complete the Photographic Waste Tag (Purple) (as shown in Appendix F), affix the generator bar code label, check the appropriate box on the tag and attach to the red containers.
5. Store containers in the building's designated waste for pick-up by ESF.

## Attachment

**Appendix F: Photographic Waste (Purple)**

## Revisions

**R03**:
- Updates to recent legislation
- Included phone number of Technician 4
- Changed 25 litre cans to 20 litres.

**R02**:
- No change in procedure
- Grammatical changes

UBC
Health, Safety
& Environment

| *Hazardous Waste Disposal Procedures –* ***Waste Battery Disposal*** | | |
|---|---|---|
| *Reference:* ***06.01.07.R02*** | *Date:* ***June 2005*** | *Page: 1 of 2* |

## Scope

This disposal procedure applies to waste batteries with classification 8 (corrosive) or classification 6 (containing toxic heavy metals) as defined by the Canada Transportation of Dangerous Goods Regulations, 2002. Disposal of these items at UBC is facilitated by the Environmental Services Facility (ESF).
Waste batteries include the following:

- Lead acid (automotive) batteries;
- Rechargeable batteries;
- All sizes of regular consumer alkaline batteries (for example, AA and AAA);
- Rechargeable batteries;
- Nickel-Cadmium batteries;
- Lithium or Mercury batteries;
- Watch batteries; and
- Any other type of battery.

If you have any questions, please contact the ESF Technician at (604) 822-1285 or (604) 822-6306.

## Purpose

This procedure specifies the procedure for the proper disposal of waste batteries such that UBC is in compliance with all legislation.

## Background

1. Because batteries are classified as a special waste, they cannot be disposed of in a landfill according to the BC Hazardous Waste Regulation, 2004.
2. Waste batteries are disposed in accordance with the BC Environmental Management Act, 2003.

## Procedure

### 1.0 Automotive Batteries

1. All batteries for disposal must be listed on a Chemical Waste Inventory Form. Clearly identify all material with proper chemical names. No abbreviations please. Forms are available from ESF. (Please contact the ESF at either (604) 822-6306 or (604) 822-1285.) Please refer to Appendix C for the form.
2. Ensure that the generator information is filled in completely.
3. Send the completed inventory form to ESF for approval by campus mail or fax ((604) 827-5807). Contact the ESF technician (at (604) 822-6306 or (604) 822-1285) if you have any questions.
4. Place the tagged car batteries in a designated pickup area, ensuring that the battery is contained in a plastic bag if it is wet or leaking.
5. The weight must not exceed 10 kg.

6. Place the box in the building's designated area for pickup by ESF.

## 2.0 General Batteries

The procedure for the disposal of all types of waste batteries except car batteries is as follows:

1. Collect all used batteries in a strong cardboard box. The weight of each box must not exceed 10 kg.
2. When the box is full, close and securely seal with packing tape. Write on the top of the box in clear lettering "Used batteries for disposal."
3. Place the box in the building's designated area for pickup by ESF.

## Attachment

**Appendix C: Chemical Waste Inventory Form**

## Revisions

**R02:**

- Updates to legislation.
- Added in phone numbers for both ESF Technician 4 and 5.
- Included rechargeable batteries.

**R01:**

- No changes

UBC
Health, Safety
& Environment

| Hazardous Waste Disposal Procedures – *Waste Oil Disposal* | | |
|---|---|---|
| *Reference:* ***06.01.08.R02*** | *Date:* ***June 2005*** | *Page: 1 of 2* |

## Scope

Waste oil is defined as a special waste if it is a "refined petroleum product that has become unsuitable for its original purpose owing to the presence of impurities, or a loss of its original properties". [1] This disposal procedure applies to the disposal of waste oil, or a non-hazardous material containing more than 3% by weight of oil.

Types of waste oil include the following:

- Automotive lubricating oil;
- Cutting oil;
- Fuel oil;
- Gear oil;
- Hydraulic oil;
- Refined petroleum based oil;
- Synthetic oil;
- Emulsion;
- Crude oil; and,
- Vacuum-pump oil.

***IMPORTANT NOTE: Waste oils must not be contaminated with PCBs (Polychlorinated Biphenyl) or solvents.***

## Purpose

This procedure specifies the requirements for the packaging and disposal of oil or material contaminated with oil, such that UBC is in compliance with all legislation.

## Background

1. Before it was proven that contaminants in oil were dangerous to human health, oil was disposed of in sewers, burned, and used as a dust suppressant on pavement. Today, oil can be used in the manufacture of pavement and for fuel only with strict adherence to guidelines imposed by the BC Hazardous Waste Regulations, 2004.
2. Waste oil is not permitted in sanitary or storm sewers in accordance with the GVRD Sewer Use Bylaw No. 164, June 2002.
3. Waste oil is not permitted in landfills in compliance with BC Hazardous Waste Regulations, 2004.
4. Any spills that exceed 100 litres and are discharged to the environment must be reported to Ministry of Environment (Call (604) 582-5200 for more information or see Environmental Reporting Procedures, Reference No. 06.02.01.R02, Dec 2004).

## Procedure

The procedure for the collection and disposal of waste oil is as follows:

1. The oil can be collected in three ways;
   a) It can be collected in the supplier's original disposable plastic container if it is in good condition (i.e. not leaking);
   b) 5 litre or 20 litre red plastic oil cans; or,
   c) 205 litre metal drums.
2. If you require empty oil containers, please contact the Environmental Technician at (604) 822-6306 or (604) 822-1285. Do not use solvent cans for oil.
3. Complete the required information on the Flammable Liquid Disposal Tag (Blue) as shown in Appendix E and affix the generator barcode sticker. Write the type of oil in the container (as defined in the Scope) in the line entitled "Other".
4. Make sure that all waste oil containers are properly tagged and identified.
5. Place the containers in the building's designated area for pickup by ESF.

***Do not mix waste oil with other solvents.***
***Do not overfill containers***.

## Attachment

**Appendix E: Flammable Liquid Disposal Tag (Blue)**

## Revisions

**R02:**

- Updates to recent legislation
- Included phone number of Technician 4

**R01:**

- **None**

UBC
Health, Safety
& Environment

**Hazardous Waste Disposal Procedures –**
# *Disposal of Unknown Laboratory Chemicals*

| Reference: ***06.01.09.R02*** | Date: ***June 2005*** | Page: *1 of 1* |
|---|---|---|

## Scope

This disposal procedure applies to hazardous laboratory chemicals in the solid or liquid form that cannot be identified and does not include gases or lecture bottles.

## Purpose

This procedure specifies the method for the proper disposal of unidentified laboratory chemicals such that UBC is in compliance with all legislation.

## Background

1. The Workers Compensation Board does not allow ESF to handle unknown chemicals.
2. The disposal of unidentified chemicals is the responsibility of the generator. The expense of identifying the unknowns is borne by the generator.
3. ESF can contact the contractor on your behalf if so required.
4. Disposal of unidentified hazardous chemicals in the sewer or landfill is prohibited by GVRD Sewer Use Bylaw 164, 2002 and by the BC Hazardous Waste Regulations, 2004.

## Procedure

***The Environmental Services Facility does not accept unknown chemicals.***

The procedure for the disposal of all types of unidentified waste is as follows:

1. Put the containers of unknowns in a cardboard box.
2. Write "Unidentified chemicals. Do not touch" on the box in clear lettering.
3. Store securely.
4. Contact the contractor directly to determine the cost of identification and disposal.
5. Contact ESF at (604) 822-6306 for a list of approved contractors.

## Attachment

**Appendix G – Exit Protocol for UBC Principal Investigators**

## Revisions

**RO2:**

- Updates to recent legislation
- Included phone number of ESF Technician 4
- Addition of the Exit Protocol as an attachment

**RO1:**

- No change to procedure

UBC
Health, Safety
& Environment

***Hazardous Waste Disposal Procedures –***
# *Disposal of Explosive Chemicals*

| *Reference:* ***06.01.10.R02*** | *Date:* ***June 2005*** | *Page: 1 of 1* |
|---|---|---|

## Scope
This procedure applies to the disposal of chemicals that are considered explosive or potentially explosive.

## Purpose
This procedure specifies the requirements for the disposal of Transport of Dangerous Goods (TDG) Class 1 (Explosives) and chemicals identified as explosive substances.

## Background
1. Explosive chemicals are classified according to the BC Environmental Management Act, 2003 and Hazardous Waste Regulation, 2004 and TDG.
2. Disposal of explosive waste in the sewer or landfill is prohibited by the GVRD Sewer Use Bylaw 164, 2002, and by Bylaws 181 and 183.

## Procedure
***The Environmental Services Facility does not accept explosives.***

The procedure for the disposal of all types of explosives is as follows:

1. Put the containers of explosives in a cardboard box.
2. Write "Explosives. Do not touch" on the box in clear lettering.
3. Store securely.
4. Contact the approved contractor directly to determine the cost of disposal.
5. Contact ESF at (604) 822-6306 for a list of approved contractors.

## Attachment
None

## Revisions
**RO2:**
- Updates to legislation
- Included phone number of ESF Technician 4

**RO1:**
Revised procedure, change to cost of disposal

UBC
Health, Safety
& Environment

| *Hazardous Waste Disposal Procedures –* ***Polychlorinated Biphenyls Disposal*** | | |
|---|---|---|
| *Reference:* ***06.01.11.R02*** | *Date:* ***June2005*** | *Page: 1 of 2* |

## Scope

This procedure is only applicable to PCB material handled by the UBC Electrical Shop. For other users, contact Environmental Services Facility (ESF) for disposal procedures.

This procedure applies to all solids or liquids containing Polychlorinated Biphenyls (PCB), including:

- Ballasts
- Transformers with contaminated oil
- Contaminated oil in barrels
- Capacitors
- Electrical cables
- Spill clean-up material

Electrical shop or Land and Building Services will be charged by ESF for the disposal of PCB waste.

## Purpose

This procedure specifies the requirements for the disposal of PCB-contaminated materials, to ensure that UBC is in compliance with all relevant legislation.

## Background

1. Disposal of PCB contaminated material in the sewer or landfill is prohibited by GVRD Bylaw 164, 2002 and by the BC Hazardous Waste Regulation, 2004.
2. PCB waste is considered a special waste under the BC Environmental Management Act, 2003.

## Procedure

### 1.0 Ballasts

1. After ballasts have been removed by UBC Electricians, they must be brought to the electrical shop and sorted into PCB-containing and non-PCB-containing ballasts using the protocol set in the Technical Guidelines (Section 16502).
2. Non-PCB containing ballasts should be placed in a container marked "Non-PCB Ballasts" and disposed of through UBC Waste Management.
3. Ballasts containing PCB's must be packaged in 20-litre (5-gallon) metal cans marked with the PCB symbol.
4. Place full cans into the metal cage at the dock area of UBC Electrical Shop. Keep cage locked at all times.
5. When the cage is near full, inform the ESF at (604) 822-6306 or (604) 822-1285.
6. Environmental Services Facility will make arrangements for a contractor to pick-up PCB-containing ballasts.

**2.0 Other PCB contaminated waste**

Contact (604) 822-6306 or (604) 822-1285 to arrange for disposal of this waste.

**Please Note:** This procedure **only** applies to PCB material handled by the UBC Electrical Shops. Contractors working for UBC in renovation or development projects are required to dispose of PCB waste as part of their projects.

## Attachment

None

## Revisions

**R02:**

- Updates to recent legislation
- Included phone number of ESF Technician 4

**R01:**

- Updated procedure

UBC
Health, Safety
& Environment

# *Hazardous Waste Disposal Procedures –* *Biomedical Waste Disposal*

| *Reference:* ***06.01.12.R02*** | *Date:* ***June2005*** | *Page: 1 of 2* |
|---|---|---|

## Scope

This procedure describes the handling, packaging and treatment required by the Environmental Services Facility (ESF) for disposal of your biomedical waste.

Biomedical waste at UBC includes the following components:

- Human anatomical;
- Human blood and body fluids;
- Primates (see below);
- Sharps (scalpel blades, syringes);
- Cytotoxics (ie. Ethidium Bromide); and,
- Pharmaceuticals (Non-narcotic).

NOTE: This procedure does not apply to Primate Anatomical Waste. Please refer to Primate Anatomical Waste Disposal 06.01.13.R01 June 2005.

NOTE: This procedure does not apply to animal bedding.

## Purpose

This procedure specifies the requirements for the handling and disposal of biomedical waste in accordance with all legislation and observing all safety precautions.

## Background

This procedure was taken from Guidelines for the Management of Biomedical Waste in Canada, written by the Canadian Council of Ministers of the Environment in February 1992. These Guidelines define what biomedical waste is, and how it should be handled.

## Procedure

***IMPORTANT NOTE: Due to the health and safety of the workers handling waste in this procedure, labelling and packaging requirements are strictly enforced. If the bags are not prepared as specified, Environmental Services Facility reserves the right to refuse collection of the waste. In the event that a shipment is not suitable, all attempts will be made to contact the generator from the information provided on the Biological Waste Disposal Tag.***

The procedure for the disposal of biomedical waste is as follows:

1. All biomedical waste ***MUST*** be put into autoclavable **red** bags bearing the **biohazard** symbol, which can be obtained from a laboratory supplier. The bag cannot leak. It is advisable to double bag your waste to ensure that there is no possibility of leakage.
2. ESF must be able to package the red bag into a box (length – 24", height – 18", width – 13") from our disposal supplier. Therefore, the maximum size of the bags must be less than the aforementioned box dimensions.
3. Each bag must not weigh more than 10 kg.
4. Complete all the required information on the Biological Waste Disposal Tag

(Appendix A), affix the barcode sticker, check the appropriate box, and fill out all requested information. Attach the tag to the bag.

5. Store in the freezer located in the building's designated area for scheduled pick-up by ESF.

## Attachment

**Appendix A: Biological Waste Disposal Tag (Red)**
**Appendix B: UBC Biological Waste Disposal - Poster**

## Revisions

**R02:**

- Included autoclavable

**R01:**

- Separate Procedure created for Primate Anatomical waste, which was previously included in Biomedical Waste Disposal Procedure.
- Change in the weight of disposal for designated pickup

UBC
Health, Safety
& Environment

# *Hazardous Waste Disposal Procedures –* *Primate Anatomical Waste Disposal*

| *Reference:* ***06.01.13.R01*** | *Date:* ***June 2005*** | *Page: 1 of 1* |
|---|---|---|

## Scope

This procedure has been modified because UBC's service provider requires primate anatomical waste to be separated from biomedical waste. Therefore, a new procedure has been added for **Primate Anatomical** waste disposal ONLY, which refers to the entire carcass, as opposed to separate parts. Separated parts can be autoclaved and disposed of as Biomedical Waste (Reference 06.01.12.R02, June 2005).

## Purpose

This procedure specifies the requirements for the handling and disposal of primate anatomical waste in accordance with all legislation and observing all safety precautions.

## Background

***Disposal Procedure for Primate Anatomical Parts***

Primates may inherently contain the Herpes B Virus, classified as a Risk Group 4 Biohazard by the Health Canada, Laboratory Biosafety Guidelines, 4th Ed., 2001. Risk Group 4 Pathogens pose a high individual and community risk of serious human or animal disease. Contact the Health, Safety & Environment Biosafety office at (604) 822-7596 for more information on Risk Group 4 Pathogens and personal protective measures.

## Procedure

1. Primate Anatomical waste must be double-bagged securely in either yellow or red plastic bags bearing "Biohazardous" printing and the universal biohazardous symbol. **DO NOT** autoclave.
2. ESF will provide a lined box. The bags must be placed in the lined box for storage.
3. The boxes of Primate Anatomical waste must then be kept in frozen storage until removal by the ESF or a designated qualified contractor, determined by the Department of Health, Safety and Environment.
4. Contact (604) 822-1285 to register the storage location and quantity of Primate Anatomical Waste. ESF will arrange for pickup and will notify the generators on the registration list.

## Revisions

**R 01:**

- Minor grammatical changes
- New Procedure, previously included in Biomedical Waste Disposal (Reference 06.01.12.R01, April 2001)

UBC
Health, Safety
& Environment

# *Hazardous Waste Disposal Procedures – Glass Waste Disposal*

| *Reference:* ***06.01.14.R01*** | *Date:* ***June2005*** | *Page: 1 of 2* |
|---|---|---|

## Scope

This procedure applies to disposal of glass that is contaminated by biohazardous (refer to scope defined in procedure 06.01.01.R02) or biomedical agents (refer to scope defined in procedure 06.01.12.R01).

Glass waste includes the following:

1. Glass bottles
2. Pipettes
3. and other glassware

## Purpose

This procedure specifies the method for proper disposal of glass waste to ensure the safety of disposal workers.

## Background

1. Disposal of contaminated glassware waste to landfills is prohibited by the GVRD under the BC Hazardous Waste Regulation, 2004.
2. Contacts for further information:

| | |
|---|---|
| Waste Management | (604) 822-3827 |
| Plant Operations | (604) 822-2172 |

## Procedure

**Only APPROVED containers may be used for these wastes. These containers must not be used for any other purpose.**

**Approved Glass waste containers**: five gallon, grey metal cans or white plastic pails. All containers must be clearly labeled as **"Glass Waste Only"**. Each container must be lined with a clear 6 mil plastic bag that encloses all the glass (pails and bags are available through Plant Operations Stores, (604) 822-5272).

Disposal of glass waste is as follows:

1. If **contaminated**, decontaminate by bleach, triple rinse and then treat as regular glass waste;
2. If **uncontaminated**, treat as regular glass waste.

In general**:**

1. Decontaminate as required.
2. Clean completely of residues, including organic vapours and chemicals
   - leave bottles of organic solvents in a fume hood for at least one day
   - rinse other reagent bottles well with cold water
3. Remove all bottle caps.
4. Remove or deface all labels and hazard warnings.

5. Place in Glass Waste containers.
6. Once Glass Waste Container is **3/4 full,** tie bag closed, ensuring that no glass objects, especially pipettes, protrude past the top of the container.
7. Attach a label to the bag indicating your building, room and telephone number.
8. Take container to the building's designated area for waste pick-up. If your area is not on the pick-up route for glass, call UBC Dispatch Office, (604) 822-4118, to schedule a pick-up.

## Revisions

**R01:**

- Minor grammatical changes

UBC
Health, Safety
& Environment

# *Hazardous Waste Disposal Procedures –* *Sharps and Needle Waste Disposal*

| *Reference:* ***06.01.15.R02*** | *Date:* ***June 2005*** | *Page: 1 of 3* |
|---|---|---|

## Scope

This procedure applies to the disposal of sharps and needles that may be contaminated or uncontaminated by biohazardous agents (refer to scope defined in procedure 06.01.01.R03, June 2005).

Sharps and needle disposal may include the following components:

1. Sharp metal cutting blades (i.e., scalpels)
2. Disposable plastic syringes
3. Needles

## Purpose

This procedure specifies the method for proper disposal of sharps and needles to ensure the safety of disposal workers.

## Background

1. Disposal of sharp and needle waste to landfills is prohibited by the GVRD under BC Hazardous Waste Regulation 2004.
2. Contacts for further Information

| | |
|---|---|
| Environmental Services Facility | (604) 822-6306 |
| Environmental Programs Officer | (604) 822-9280 |
| Waste Management | (604) 822-3827 |
| Plant Operations | (604) 822-2172 |

## Procedure

### 1.0 Sharps and Needles

Sharps and needles present both a physical and potentially infectious hazard. To control these hazards, sharps and needles **must** be collected in **APPROVED** containers made of a hard impervious plastic that is both autoclavable and acceptable for incineration. Preferably, they should be red in colour but if not, they **must** be easily identifiable and boldly labelled in an approved sharps container with a biohazardous label on the outside. These containers can be purchased from a laboratory supplier. **Only APPROVED containers may be used for these wastes. These containers must not be used for any other purpose.**

Sharps and needles disposal procedures are as follows:

1. Collect all sharps and needles in **approved plastic** "sharps containers".
2. Do not fill the container past the indicated “Full” line.
3. Chemically decontaminate all infectious items prior to disposal into the container or, autoclave the entire container once it is full.
4. Securely close and snap the lid in place.
5. Take the full container to the building's designated area for pick-up and disposal.

6. Do ***NOT*** put sharps into plastic bags.
7. If there is more than one sharps container, place the containers in an unsealed open cardboard box.
8. Containers must be tagged with the Biological Waste Disposal Tag, affix your waste generator barcode sticker (call 822-6306 for either of these supplies). Identify waste content by checking the appropriate box on the tag and fill out the requested information (Appendix A).

***Sharps containers MUST NOT be placed into the "Glass Waste Only" cans. They are to be taken to the building's designated area for hazardous waste disposal.***

## 2.0 Disposable Plastic Syringes

1. Syringe bodies (with needles removed) can be collected in a clear plastic bag and will become Risk Group 1 waste. (For needles, refer to Section 1.0.)
2. All Risk Group 1 waste ***MUST*** be contained in **CLEAR and UNLABELLED** autoclave bags. Bags ***MUST NOT*** be marked with any biohazardous warning symbols or warning labels. The bags **MUST** then be autoclaved sufficiently to render the organism in question harmless. Autoclaved bags **MUST** be leak proof. To prevent leaks and breakage during storage or transportation, double bagging with a clear plastic bag is required.
3. Each bag ***must not*** weigh more than 10 kg.
4. Do not put glass or sharps in with Risk Group 1 waste.
5. After autoclaving, bags must be tagged with the UBC Environmental Services **Biological Waste Disposal tag (Red)** (as shown in Appendix A). Affix your waste generator number sticker where indicated. On the tag, check the box marked "**Autoclaved Risk Group 1**" and place it in the building's designated area for pick-up by ESF. (Contact the ESF Technician at (604) 827-5389 if you require any of these supplies).

## Attachment

**Appendix A- Biological Waste Disposal Tag (Red)**

## Revisions

**RO2:**

- Included: should be red in colour but if not, they **must** be easily identifiable and boldly labeled.
- Included: do not put sharps into a plastic bag or any other unsuitable container.
- Included: biowaste disposal Environmental Services Facility Waste Generator disposal tag.
- Removed incineration.
- Ensure bag is less than 10 kg.
- Minor grammatical changes.

**RO1:**

- New procedure previously included in Biohazardous Waste disposal.
- Procedure change: waste generator tag needed in Plastic Syringe Disposal.

UBC
Health, Safety
& Environment

| *Hazardous Waste Disposal Procedures –* ***Propane and Butane Cylinder Disposal*** | | |
|---|---|---|
| *Reference:* ***06.01.16.R01*** | *Date:* ***June2005*** | *Page: 1 of 2* |

## Scope

This procedure applies only to the disposal of propane and butane cylinders. This procedure does not apply to other gas cylinders and lecture bottles.

## Purpose

This procedure specifies the safe and proper disposal of the propane and butane gas cylinders for staff and disposal workers.

## Background

Compress gas cylinders are not accepted at local landfills. As a result many of the university's compressed gas cylinders for disposal (empty or full) remain in the buildings creating a safety hazard for explosions.

Gas cylinders should be disposed/recycled in a safe manner. When purchasing compress gas cylinders, ensure that cylinders are refillable or can be returned to the supplier.

## Procedure

### 1.0 Propane/ Butane containers

1. All propane and butane containers for disposal must be listed on a Chemical Waste Inventory Form. Forms are available from ESF. (Please contact the Environmental Technician at either (604) 822-6306 or (604) 822-1285.) Please refer to Appendix C for an example.
2. Ensure that the generator information is filled in completely.
3. Send the completed inventory form to ESF for approval by campus mail or fax ((604) 827-5807). Contact the ESF technician (at (604) 822-6306 or (604) 822-1285) if you have any questions.
4. ESF will process your request and send back your form.
5. After the coded form has been returned, package containers in strong cardboard boxes.
6. The weight of each box must not exceed 10 kg.
7. Once the box is full, tape the box closed.
8. With a felt-tipped pen, write on top of each box the generator's name, department, and telephone number. Then tape an envelope with <u>one</u> copy of the coded Chemical Waste Inventory form on top of one of the boxes.
9. Place the boxes in the building's designated area for pickup by ESF.

### 2.0 Lecture Bottles and Other Gas Cylinders

***NOTE: Environmental Services Facility (ESF) cannot dispose of lecture bottles.***

For disposal of lecture bottles and other gas cylinders, please return them to

the supplier.

If unable to return bottles, ESF can make arrangements for disposal through an approved waste contractor at your expense.

If there are any questions about the disposal procedure, please contact ESF Technician at (604) 827-5389.

## Attachment

**Appendix C:** Chemical Waste Inventory Form

## Revisions

**R01:**

- Included: the following: Non-reusable containers should be re-packaged and put into the garbage, those that are re-usable and have them aired out.
- Included: Non-reusable containers should be re-packaged and put into the garbage, those that are re-usable and have them aired out.
- Included: Ivan Leversage at (604) 827-5389.

UBC
Health, Safety
& Environment

| *Hazardous Waste Disposal Procedures –* ***Non-Indigenous Species Disposal*** | | |
|---|---|---|
| *Reference:* ***06.01.17.R01*** | *Date:* ***June2005*** | *Page: 1 of 2* |

## Scope

This protocol is applicable to all departments and administrative units with laboratories where non-indigenous species are used for research purposes.

***Non-indigenous species*** can be defined as:

Species that are not native (indigenous) to an area and have been introduced through human activities either on purpose or by accident. The term includes *targeted* species of organism whether from a distant or nearby source (e.g., the Fraser Valley). Although a species of organism may occur naturally at a UBC site, the introduction of foreign populations of the same species can have a negative impact on local populations. Therefore, these organisms are also regarded as non-indigenous.

Materials that may contain non-indigenous species include:

1. Soils-all types
2. Single pass and recirculating fresh and saltwater cooling or aquarium systems
3. Animal bedding materials
4. Algae and plants
5. Terrestrials and aquatic plants and animals including those on baits, nets and sampling equipment.
6. Cultured organisms-microorganisms, plants and animals
7. Cloned and genetically altered organisms-all types

## Purpose

To provide a series of protocols for the disposal of non-indigenous organisms or material containing or potentially containing these organisms

## Background

Numerous species and clones of microorganisms, plants, soils, animals and animal bedding materials are used in research projects and in student laboratories at the University of British Columbia (UBC). Many are not native to this area and are classified as "Non-Indigenous"or "Exotic". Currently, there is very limited regulation of non-indigenous species or biological material, which has the potential to introduce them. Many potential non-indigenous species are tolerated in a wide range of environments and when accidentally or intentionally introduced, have the ability to colonize and replace existing native species. Since displaced species are essential in maintaining a healthy, balanced ecosystem, non-indigenous species have the potential to cause significant ecological or financial damage. There are many examples, which clearly demonstrate the extensive damage that non-indigenous invaders may have on an ecosystem, such as purple loosestrife and zebra mussels. Purple loosestrife, introduced during the 19$^{th}$ century, made an explosive migration across the continents through marshy

environments, displacing many native plants. Zebra mussels introduced in the mid 1980s into Lake St. Claire, caused extensive damage by clogging intake and outlet pipes used by municipalities, industries and electrical utilities. Examples such as these have resulted in increased regional, national and international concern about the effects of non-indigenous species. As a result UBC has established a series of protocols for the disposal of non-indigenous organisms or material containing or potentially containing these organisms.

## Procedure

Disposal of non-indigenous species will be considered as Risk Group 2 Agents with **moderate individual and limited community risk. (If you have any questions, please contact the Biosafety Officer at (604) 822-7596).**

1. All Risk Group 2 waste ***MUST*** be contained in **ORANGE** autoclave bags (Bags may be purchased from any laboratory supplies vendor). The bags **MUST** then be autoclaved sufficiently to render the organism in question harmless. Autoclaved bags must be leak proof. To prevent leaks and breakage during storage or transportation, double bagging with a clear plastic bag is required.
2. ESF must be able to package the red bag into a box (length – 22", height – 22", width – 22") from our disposal supplier. Therefore, the maximum size of the bags must be less than the aforementioned box dimensions.
3. Each bag must not weigh more than 10 kg.
4. Do not put glass or sharps in with Risk Group 2 waste.

After autoclaving, bags must be tagged with the UBC Environmental Services **Biological Waste Disposal tag (Red)** (as shown in Appendix A), Affix your waste generator number sticker where indicated. On the tag, check the box marked "**Autoclaved Non-indigenous Species**" and place it in the building's designated area for pick-up by ESF. (Contact the ESF Technician at (604) 827-5389 if you require any of these supplies).

## Revisions

**R01**:
Minor grammatical changes

UBC
Health, Safety
& Environment

# Hazardous Waste Disposal Procedures – *Waste Mercury Disposal*

| Reference: **06.01.18.R01** | Date: **June2005** | Page: 1 of 2 |
|---|---|---|

## Scope

This procedure applies to the disposal of mercury waste, such as:

- Thermometers, barometers and manometers (broken or unbroken) and,
- Mercury spill cleanup.

## Purpose

This procedure specifies the proper disposal of mercury waste in order to ensure the safety of workers and staff, and in compliance with the BC Environmental Management Act, 2003 and the BC Hazardous Waste Regulation, 2004.

## Background

1. Waste mercury may be regulated as Class 6 Toxic Substance or Class 8 Corrosive Substance, as defined by the BC Hazardous Waste Regulation, 2004.
2. The GVRD Sewer Use Bylaw No. 164, 2002 and the BC Hazardous Waste Regulation, 2004 prohibits the discharge of waste mercury into the sewer or landfill.
3. Any spills of mercury into the environment (land, air, water, sewer) must be reported to the Provincial Emergency Program, (contact (604) 582-5200 for more information or see Environmental Reporting Procedures, Reference No. 06.02.01.R02 December 2004, UBC Department of Health Safety and Environment).

## Procedure

### 1.0 Mercury Thermometers (Unbroken or Waste)

If no mercury has spilled and the thermometers are intact, put into a glass or plastic bottle. Label the bottle "Mercury Thermometers for Disposal" and list it on the Chemical Waste Inventory Form (Appendix C). Fax to Environmental Service Facility for approval.

### 2.0 Broken Mercury Thermometers or Mercury Spill

1. Report the spill to a supervisor; if necessary, contact HAZMAT (911) for immediate assistance and Health, Safety and Environment (604) 822-2029 for further assistance.
2. Evacuate all personnel from area if spill is large, the room is small and ventilation is poor.
3. If you are going to participate in the cleanup, wear appropriate personnel protective equipment such as lab coat, gloves (rubber or latex or vinyl), plastic boot protectors, splash goggles and half-mask respirator with approved cartridge for mercury vapours (HAZMAT may determine that self contained breathing apparatus may be required if spill is large, temperature is elevated, and/or site of spill is in an enclosed space with poor ventilation).

4. Ventilate area as much as possible ( i.e., open all windows).
5. Mark off spill area with signs, barriers or tape.
6. If spill is on a flat, even smooth surface, use two pieces of firm straight edge paper, (i.e., copying paper) or plastic and slowly guide the droplets together into a pool).
7. Use glass pipette with rubber ball to suck up the mercury and collect it in the smallest size possible bottle (glass or plastic) with a tightly fitting lid. Label the bottle with "Mercury waste."
8. For picking up tiny droplets on uneven surfaces, use Merconvap wipes. For tiny droplets in cracks, pieces of metallic Zinc rinsed in 10% HCL can be used. Run the Zinc along the cracks and touch visible droplets directly with it. Add used Merconvap wipes and zinc pieces to "Mercury waste" bottle.
9. To neutralize unreachable mercury in crevices, etc., drizzle area with Sulphur flour or spray with Merconvap.

   To obtain Zinc, Sulphur or Merconvap, call Chemistry Stores - Paul Crathern at: 822-6849.
10. List "Waste Mercury" on your next Chemical Waste Inventory Form to be sent to ESF for approval.

## Attachment

**Appendix C**: Chemical Waste Inventory

## Revisions

**R01:**

- Replaced Ron Aamodt with Ivan Leversage
- Replaced George Gunn with Paul Crathern
- Updated legislation

# Appendices

# Appendix A
# Biological Waste Disposal Tag (Red)

# BIOLOGICAL WASTE DISPOSAL

University of British Columbia, Environmental Services (822-1285)

Parcel Identification No.: B000050905


# BIOLOGICAL WASTE DISPOSAL

Parcel Identification No.: B000050905


*GENERATOR TO COMPLETE THIS SECTION ONLY*

*Affix Generator Barcode Label Here*

## WASTE CONTENT ( Please ✓ )

**BIOMEDICAL (TDG Class 6.2, 6.1)**

- ☐ Anatomical - Human
- ☐ Human Blood & Body Fluids
- ☐ Primates ** (See Below)
- ☐ Sharps (scalpel blades, syringes)
- ☐ Cytotoxics (i.e., Ethidium Bromide)
- ☐ Pharmaceuticals (Non-narcotic)

**NON-BIOMEDICAL**

- ☐ Anatomical - Animal
- ☐ Autoclaved Risk Group 1
- ☐ Autoclaved Risk Group 2
- ☐ Autoclaved Risk Group 3**
- ☐ Autoclaved Non-Indigenous Species

****NOTE: Special arrangements must be made for Primates & Risk Group 3 Waste**

☐ Other: _____

Office use only:

**DATE RECEIVED** (mm/dd/yy) _____

**QUANTITY** _____ kg

**University of BC Environmental Services Facility (Contact 822-1285)** Aug 2001

# Appendix B
# Biological Waste Disposal - Poster

# UBC Biological Waste Disposal

## General Waste Disposal Procedures

March 2006


1. All hazardous waste generators require a Generator ID number from the Environmental Services Facility.
2. Segregate the biological waste—do not mix waste types. Only one type of waste per bag/tag.
3. Package and store biological waste according to procedures. Refer to manual for more detail.
4. Affix generator sticker and attach the Biological Waste Disposal Tag to the packaged biological waste.
5. Each bag must not weigh more than 10 kg.
6. Ensure that bags are not leaking and have not been punctured by sharp objects. Double bag if necessary.
7. Store bags in designated location for scheduled pick-up.
8. Contact ESF (604)822-1285 if you have any questions.

***Ensure that freezers are defrosted and storage areas are cleaned and sterilized regularly.***

| Type of Waste | Treatment | Storage Requirements | Tag Label |
|---|---|---|---|
| **Pathological Waste**<br>• Animal Carcasses/parts/blood<br>• Uncontaminated Animal tissues<br>• Fungi, insects, parasites | None Required | • 6 mil **Black** Polypropylene bags<br>• Double bag to ensure no leaks<br>• Store in freezer for pick-up<br>• Remove any tubing, catheters, clips, tags before packaging | Label as **ANATOMICAL—ANIMAL** |
| **Risk Group 1 Waste (RG1)***<br>Materials **contaminated** with RG1 agents.<br>• Plastic pipette tips, filter paper, petri dishes, syringes, Agar plates<br>• Gloves, towels, tubing, plastics | **Autoclave or chemically sterilize** | • **Clear and unlabeled** auto-claved bags<br>• Double bag with clear and unlabeled bags to ensure no leaks<br>• Store in cool room for pick-up | Label as **AUTOCLAVED RISK GROUP 1** |
| **Risk Group 2 Waste (RG2)***<br>Materials **contaminated** with RG2 agents.<br>• Plastic pipette tips, petri dishes,<br>• Filter paper syringes, Agar plates gloves, towels, tubing, plastics | **Autoclave or chemically sterilize** | • **Orange** autoclaved bags, **labeled** as BIOHAZARDOUS<br>• Double bag with clear bags to ensure no leaks<br>• Store in cool room for pick-up | Label as **AUTOCLAVED RISK GROUP 2** |
| **Pathological Waste contaminated with Biohazardous waste**<br>• Animal tissues contaminated with RG1* or RG2* agents | None Required | • **Red or Yellow bags**<br>• Double bag with bags to ensure no leaks<br>• Store in freezer for pick-up | Label as **BLOOD AND BODILY FLUIDS** |
| **Biomedical Waste**<br>• Anatomical—Human Waste<br>• Human blood and fluids<br>• Human tissues<br>• Contaminated plastics and gloves | None required | • **Red or Yellow bags**<br>• Double bag with bags to ensure no leaks<br>• Store in freezer for pick-up | Label as **ANATOMICAL—HUMAN** or **HUMAN BLOOD & BODILY FLUIDS** |
| **Sharps Wastes**<br>• Scalpel blades<br>• Syringes needles<br>• Razor blades<br>• Contaminated broken glass | **Autoclave or chemically sterilize** | • **Red or Yellow plastic "sharps containers"**<br>• Ensure lid is properly tightened | Label as **SHARPS** |
| **Contaminated Glass waste**<br>• Glassware contaminated with a biohazardous agent | **Autoclave or chemically sterilize** | • Regular glass waste disposal<br>• **Thick clear plastic** bag in a bucket labeled as "**Glass Waste Only**" | Dispose of Glass Waste through Plant Operations—Waste Management |

* as defined by the Laboratory Biosafety Guidelines 2nd Edition, 1996 (Health Canada)

Due to health and safety of workers handling waste, procedures, labeling and packaging requirements are strictly enforced. If wastes are not prepared as specified, Environmental Services Facility reserves the right to refuse collection.

Environmental Services Facility
Dept. of Health, Safety and Environment
Bang Dang - (2-1285) - bang@interchange.ubc.ca
Ivan Leversage - (2-6306) - leversag@interchange.ubc.ca
Ed Lee - (2-9280) - lee@hse.ubc.ca
Http://www.hse.ubc.ca

# Appendix C
# Chemical Waste Inventory

# Chemical Waste Inventory

| | Chemical Name | Size/volume/ weight | Identification/ Comments | Code (office only) |
|---|---|---|---|---|
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | | | | |
| 5 | | | | |
| 6 | | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |

| | | |
|---|---|---|
| Name | Dept | |
| Building | Rm # | Date |
| Phone | Email | |

For Office Use Only:

Date Received

Approved

Complete the form in full and fax to the Environmental Services Facility (827-5087) for approval. Please contact Ivan Leversage (822-6306) if you have any questions.

# Appendix D
# Solvent Recovery

# SOLVENT - RECOVERY

University of British Columbia, Environmental Services *822-1285 or 822-6306*

# SOLVENT - RECOVERY

*GENERATOR TO COMPLETE THIS SECTION ONLY*

*Affix Identification Barcode Label Here*

**Do NOT include acidic, basic or aqueous solutions, or solids such as sludge, grit, glass, plastic, paper, inorganic chemicals, etc.**

**WASTE CONTENT ( ☑ & quantify components >40% )**

| | | |
|---|---|---|
| ☐ Acetone _____% | ☐ Isopropyl Alcohol _____% | ☐ Varsol _____% |
| ☐ Xylenes _____% | ☐ Benzene _____% | ☐ Thinners _____% |
| ☐ Methanol _____% | ☐ Water _____% | ☐ Hexanes _____% |

OTHER: _____ ____%

Office use only:

**DATE RECEIVED** (mm/dd/yy) _____

| **QUANTITY** | **STORAGE DETAILS** |
|---|---|
| ☐ 4 L | CWPF, Rm 101, Shelf/Row _____ |
| ☐ 20 L | CARGO TRAILER |
| ☐ _____ L | Other _____ |

**University of BC. Environmental Services Facility (Contact 822-1285)**

# Appendix E
# Flammable Liquid Disposal Tag (Blue)

# FLAMMABLE LIQUIDS DISPOSAL

University of British Columbia, Environmental Services 822-1285 or 822-6306

Parcel Identification No.: S000061100

# FLAMMABLE LIQUID DISPOSAL

Parcel Identification No.: S000061100

*GENERATOR TO COMPLETE THIS SECTION ONLY*

*Affix Identification Barcode Label Here*

**Do NOT include acidic, basic or aqueous solutions, or solids such as sludge, grit, glass, plastic, paper, inorganic chemicals, etc.**

**WASTE CONTENT (☑ & quantify components >10%)**

| ☐ Non-halogenated | | | ☐ Halogenated | |
|---|---|---|---|---|
| ☐ Alcohols _____% | ☐ Esters _____% | | ☐ Carbon Tet. _____% | |
| ☐ Aldehydes _____% | ☐ Ethers _____% | | ☐ Chloroform _____% | |
| ☐ Aliatics _____% | ☐ Ketones _____% | | ☐ TCE _____% | |
| ☐ Aromatics _____% | ☐ Thinners _____% | | ☐ Freons _____% | |
| ☐ Amines _____% | ☐ Oil (non-PCB) ___% | | ☐ Other _____% | |

☐ OTHER: _____ ___%

**NOTE: Contents in this container may be recycled or reused.**

Office use only:

**DATE RECEIVED** (mm/dd/yy) _____

| **QUANTITY** | **STORAGE DETAILS** |
|---|---|
| ☐ 4 L | CWPF, Rm 101, Shelf/Row _____ |
| ☐ 20 L | CARGO TRAILER #5 |
| ☐ _____ L | Other _____ |

**University of BC Environmental Services Facility (Contact 822-1285)** May 2001

# Appendix F
# Photographic Waste

# PHOTOGRAPHIC WASTE - TREATMENT

University of British Columbia, Environmental Services 822-1285 or 822-6306

## PHOTOGRAPHIC WASTE - RECEIPT

*GENERATOR TO COMPLETE THIS SECTION ONLY*

*Affix Identification Barcode Label Here*

**WASTE CONTENTS**

- ☐ Developer
- ☐ Fixer
- ☐ Stop / Stabilizer

OTHER: _____

Office use only:

**DATE RECEIVED** (mm/dd/yy) _____

**DATE TREATED** (mm/dd/yy) _____

**Volume**

- 4L ☐
- **20L** ☐

**University of BC, Environmental Services Facility (Contact: 822-1285)**

# Appendix G
# Exit Protocol for UBC Principal Investigators

UBC
Health, Safety & Environment

# EXIT PROTOCOL FOR UBC PRINCIPAL INVESTIGATORS

| Reference: | Date: June, 2005 | Page : 1 of 3 |
|---|---|---|

**Scope**

This protocol is applicable to all departments with laboratories or operations where hazardous materials or equipment are used.

**Purpose**

To provide a framework for Departmental Heads of Unit to develop a site-specific exit protocol for research faculty under their supervision.

**Background**

The advent of WHMIS, provincial and federal environmental regulations, Nuclear Safety and Control Act (2000) requirements and Health Canada Guidelines for Biohazards has made it critical that principal investigators decommission laboratories to ensure that the legal and ethical expectations associated with such work are met.

Properly applied an exit protocol ensures that:

- Departmental policies and procedures are followed;
- Unsafe conditions are eliminated;
- A proper clean-up is performed;
- Lab equipment is properly disposed/recycled;
- Hazardous materials are properly disposed/recycled;
- Work surfaces are free of contamination; and
- Regulatory requirements are met.

**Notification**

When a faculty member informs their Department head of their intentions to leave UBC, (suggested **minimum** three months notice) the Department head shall provide a copy of the Departmental exit protocol. It is suggested for purposes of due diligence that the date of this information transfer be documented. It is then the responsibility of the department head to monitor that the faculty member follows all the steps in the protocol to completion, including all requirements for documentation.

**Checklist**

A checklist will provide a simple method for the Department head to confirm the protocol has been completed. The faculty member shall submit a completed exit protocol checklist to the department head prior to departure. The department head shall keep a copy and a copy shall also be provided to the faculty member.

**Procedure**

When the primary researcher or supervisor of a laboratory leaves or decommissions a laboratory, the following procedures shall be followed.

**General**

1. A current inventory of all hazardous materials must be completed.
2. All unknowns must be identified and appropriately labeled.
3. All chemicals should be removed from the laboratory, by transferring to another primary researcher/laboratory supervisor, or by disposal through the Environmental Services Facility (ESF).
4. The Departmental Safety Committee should inspect the laboratory to ensure removal of all material and approve the removal by signing the inventory form.
5. An approved inventory form should be sent to the Departmental Head or Director. It is the responsibility of the Department Head or Director to ensure that adequate procedures are followed for the decommissioning of laboratories.

**Transfer of Chemicals to another Primary Researcher or Laboratory Supervisor**

All materials transferred must be labeled according to WHMIS requirements and the receiving party must obtain appropriate Material Safety Data Sheets. For further information contact the University Occupational Hygiene Officer, 604-822-2643.

Some of the materials may be forwarded to the University Chemical Exchange Program for future use. Contact the ESF at 822-6306 for further information.

**Disposal of Chemicals**

The identity of all materials must be established before disposal. If there are unidentified materials, contact Health, Safety and Environment to arrange for materials to be classified for waste disposal purposes; there will be a cost associated with this process (~$100.00 - $150.00/hour).

A chemical disposal inventory form must be completed for all chemicals ready for disposal, and forwarded to the Department of Health, Safety & Environment. Following approval by ESF staff, the materials must be packaged according to the instructions provided and then arrangements are to be made with ESF at

822-6306, for pick-up of the material.

Return compressed gas cylinders to suppliers.

**Radioisotope Licence De-Activation & Lab Decommissioning**

**Required from the Licensee:**

1. Memo to Radiation Safety Office (RSO) stating intent to discontinue the isotope license.
2. Complete a set of wipe tests for every laboratory licensed for isotope use.
3. Record of proper disposal of all isotopes on hand (this can include a gift of remaining isotope to another researcher that is licensed for that nuclide).
4. Completion of a yearly isotope inventory (from RSO).
5. If the researcher is leaving the University, or does not intend to re-activate the licence at some future date, all isotope purchase, usage, disposal and contamination control records must be forwarded to the Radiation Safety Office.

Following the completion of the above steps, the Radiation Safety Officer will remove all signs. Thereafter, a letter will be issued to the researcher stating that the licence is no longer active. Decommissioning of laboratory space is not complete until verification by the Radiation Safety Office.

**Biohazard Laboratory Decommissioning**

1. Notify the Biosafety Office (604-822-7596) that biohazard protocols are to be concluded.
2. Record transfer of Biohazardous materials to the inventory of another researcher.
3. Terminate all Biohazards not transferred to the inventory of another researcher.
4. Decontaminate all working surfaces.
5. Conclude liquid nitrogen delivery contract.

**References**

**Definitions**

# Appendix H
# Isotope Inventory Control Sheet

# RADIOISOTOPE DATA SHEET

**NOTE: THERE SHOULD BE ONE DATASHEET PER STOCK VIAL** **See Over ➔**

ISOTOPE _____ ACTIVITY_____***** VOLUME_____ VIAL IDENTIFIER_____

DATE RECEIVED_____ WIPE TEST Of Outside Of Shipping Container_____CPM Stock vial Stored in Room #_____

Internet Notification or Post Card sent to Radiation Safety Office YES Name of person RECEIVING Isotope_____

| USAGE DATE | USER | ACTIVITY USED **Also record if** | ACTIVITY REMAINING **isotope is moved** | VOLUME USED **to a secondary** | VOLUME REMAINING **stock vial** | DISPOSAL OF ACTIVITY * | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | | | | DECAY | DRAINS or RED CANS | COMBUST. | NONCOMB. |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |

Date Vial Finished_____/_____/_____ Vial Transferred to Waste Container #_____ for Disposal

***** = UNITS kBq, MBq, µCi or mCi

Waste Packaged in Container(s) #_____ stored in Room #_____ for Decay **OR** for Immediate Disposal

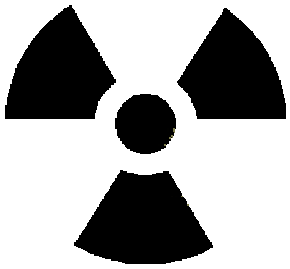
Waste Container(s) Disposed on _____/_____/_____(date) Wipe tests must correspond to Usage records

Fill out the top section when receiving the shipment of radioactive material. Post cards are available from the Radiation Safety Office or you may provide the required information through the Internet at www.safety.ubc.ca/rad/radhome.htm

Fill out the middle section when using the radioactive material. If the main stock vial is separated into secondary stock vials, i.e. to be used under different licences or different researchers, record this information on the original sheet and create a separate inventory sheet for each of the secondary stock vials.

Fill out the bottom section when the waste container(s) is to be disposed and when the stock vial is no longer of use. Ensure that if the waste container is stored in a room other than the room where the stock vial is stored, that the location of the waste container is identified. When a container is held for decay, place a notice on the container indicating, licencee, user, container number, isotope, activity, radiation field on the container surface, initial date and disposal date. These notices are available through the Radiation Safety Office. When the decay date is reached and the material is being disposed, save the notice with your records and note the date on the inventory form.

# Appendix I
# Low Activity Waste for Decay Form



***Caution***
*Radioactive Material*

# ***Low Activity Waste for Decay***

LICENSEE _____

USER _____ Bag # _____

ISOTOPE _____ ACTIVITY_____

Radiation Field on Container Surface on Initial Date

____mR/hr or____μSv/hr

Initial Date _____

Disposal Date _____

Remove This Sheet on Disposal Date and Save in Records

# Appendix J
# Environmental Reporting Procedures

# ENVIRONMENTAL REPORTING PROCEDURES



## Scope

Environmental reporting procedures are applicable to all UBC activities and operations. These procedures are specific to the Point Grey campus and may require modification for use at other University locations.

## Purpose

To ensure that all spills of hazardous materials are reported to the appropriate authority as required by law.

## Background

Many different statutes impose specific legal obligations to report spills to provincial and federal agencies. The primary responsibility of any person who has possession, charge, or control of a hazardous material is to do everything in his or her power to prevent a spill of that material. This includes establishing programs to prevent the escape of the material, such as identifying areas where there are potential risks of spills, adopting procedures and technologies to minimize or eliminate such risks, and ensuring anyone handling the materials is trained in the relevant procedures and technologies.

When a spill does occur, the responsible person must act quickly to stop, contain and minimize the effects of the spill. Courts impose stricter penalties for convictions arising from a spill if there was a delay in responding to or reporting of the spill. A spill is defined as an **external release** to air, water or land. A dangerous good released from its packaging in transit or on arrival is also considered a reportable spill under *Transportation of Dangerous Goods Act 1992 (as amended in 1994, 1997 & 1999).*

In the event of a spill, more than one piece of legislation may apply and more than one agency may require a spill report to be completed. These reports are time sensitive.

## Procedure

1. When the potential for a spill exists programs are to be established to prevent the escape of hazardous materials. This should include identifying areas where there are potential risks of spills, adopting procedures and technologies to minimize or eliminate such risks, and ensuring all personnel involved are trained in the procedures and technologies.

2. In the event of a spill or release of material, persons in the immediate area should act to ensure their personal safety. The responsible person must act quickly to stop, contain, minimize the effects of and clean up the affected area, where possible and safe - this may include initiating an Emergency Response (911).

3. Identify the material and the quantity spilled.

4. The responsible person must determine, using Table 1 below, if the spill is reportable and which agencies require notification.

5. The responsible person must notify all applicable agencies immediately and complete the UBC Spill Reporting Form (Appendix 2).

6. The responsible person is to keep the original Spill Reporting Form and fax a copy to the Department of Health, Safety & Environment (fax# 604-822-6650) as soon as reasonably possible. The Department of Health, Safety & Environment must also be notified by phone, (604) 822-2029, of the spill as soon as possible. A second copy of the form must be forwarded to the applicable Administrative Head of Unit.

**Figure 1: Spill Reporting Procedure**

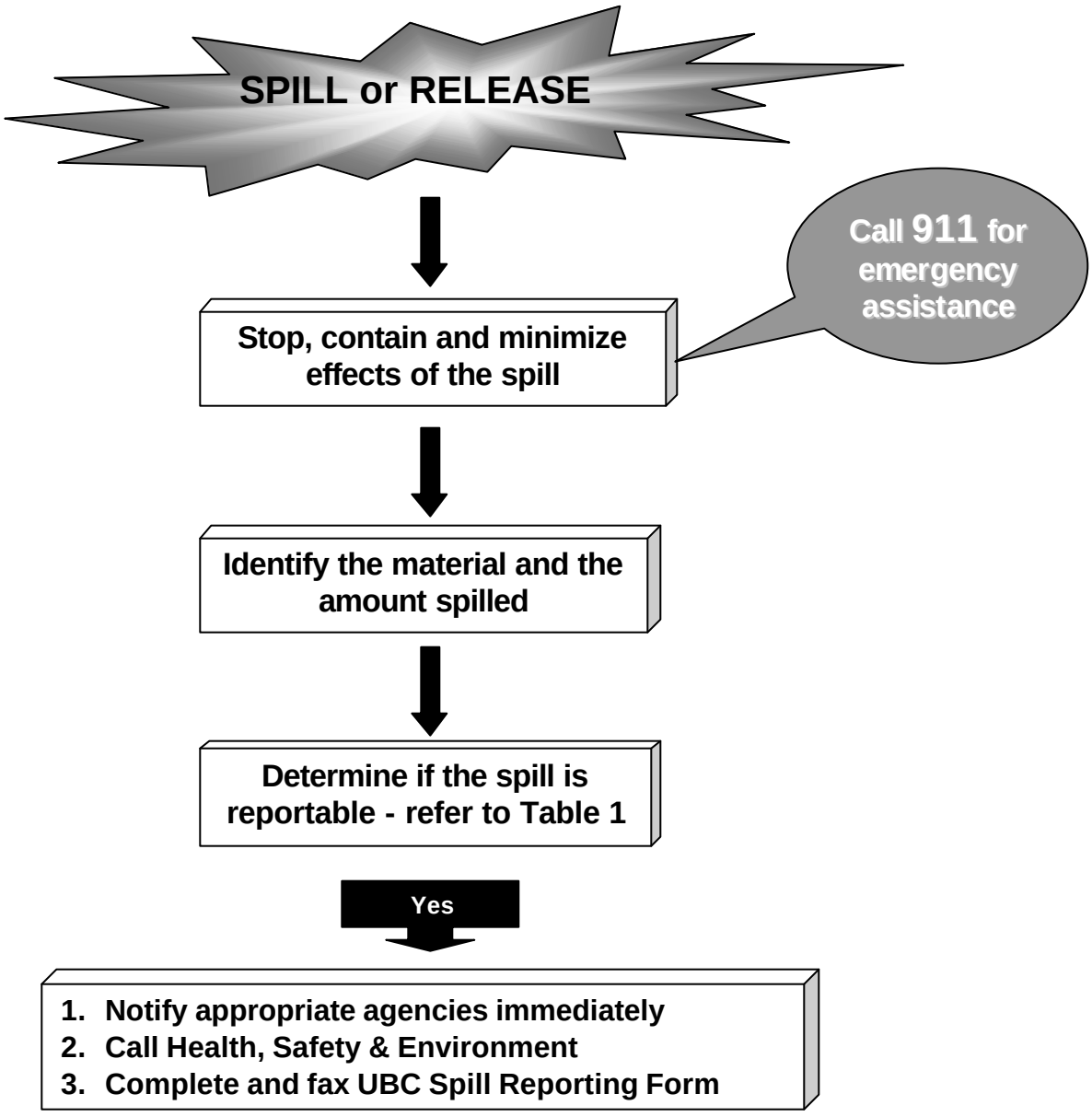


**TABLE 1 – Determination of Materials and Agencies Requiring Notification**
All Classes refer to the Transportation of Dangerous Goods classification, see Appendix 3

Use the following table to determine if a spill is reportable and which agency(ies) should be notified. 1) Find the substance under "Substance Spilled", 2) Compare the actual amount spilled to the "Specified Amount", if the actual is equal to or greater than the specified amount report the spill to the "Contact Agencies" listed in the final column.

| CRITERIA/SUBSTANCE SPILLED | SPECIFIED AMOUNT | Required Contact Agencies |
|---|---|---|
| Waste containing a pest control product | **Any** | Pesticide Mgmt Program & PEP |
| Waste oil | **100 litres** | PEP |
| Explosives of Class 1 | **Any** | PEP & Transport Canada |
| Flammable gases of Division 1 of Class 2 | **10 kg where spill results from equipment failure, error, deliberate action, or inaction** | PEP |
| Non-flammable gases of Division 2 of Class 2 | **10 kg where spill results from equipment failure, error, deliberate action or inaction** | PEP |
| Poisonous gases of Division 3 of Class 2 | **Any** | PEP & Transport Canada |
| Flammable liquids of Class 3 | **100 litres** | PEP |
| Flammable solids of Class 4 | **25 kg** | PEP & Transport Canada |
| Products or substances that are oxidizing substances of Division 1 of Class 5 | **50 kg or 50 L** | PEP & Transport Canada |
| Products or substances that are organic compounds that contain the bivalent "-0-0-" structure of Division 2 of Class 5 | **1 kg or 1 L** | PEP & Transport Canada |
| Products or substances that are poisons of Division 1 of Class 6 | **5 kg or 5 L** | PEP & Transport Canada |
| Organisms that are infectious or that are reasonably believed to be infectious, and the toxins of these organisms (risk group II and above) | **Any** | PEP & Transport Canada |
| Radioactive materials of Class 7 | **All discharges of a radiation level exceeding 10Msv/h at the package surface and 200uSv/h at 1 m from the package surface** | PEP & Transport Canada |

| CRITERIA/SUBSTANCE SPILLED | SPECIFIED AMOUNT | Required Contact Agencies |
|---|---|---|
| Corrosive materials of Class 8 | **5 kg or 5 L** | PEP & Transport Canada |
| Waste Asbestos | **50 kg** | PEP |
| Miscellaneous products or substances of Class 9 | **50 kg or 50 L** | PEP & Transport Canada |
| A substance not covered by these items that can cause pollution | **200 kg or 200 L** | PEP |
| Natural Gas | **10 kg, if there is a breakage in a pipeline or fitting operated at >100psi that results in a sudden release** | PEP |
| One of the 45 materials on the List of Toxic substances (refer to Appendix 4) | **Any** | Environment Canada |
| A major release of a toxic or hazardous material | **1 The incident resulted in an injury that required immediate medical attention beyond the level of service provided by a first aid attendant or injuries to several workers which require first aid.**<br>**2 The incident resulted in a situation of continuing danger to workers, as when the release of a chemical cannot be readily or quickly cleaned up.** | Workers Compensation Board |
| A substance that is or may be a health hazard | **Any** | Medical Health Officer |
| Deleterious substance released into water frequented by fish | **Any** | PEP |

| | | | |
|---|---|---|---|
| **Emergency Response** | 911 | **Health, Safety & Environment** | Ph: (604) 822-2029<br>Fax: (604) 822-6650) |
| **Provincial Emergency Program (PEP)** | (250) 387-5956 or 1-800-663-3456 | **Transport Canada** | (604) 224-1322 |
| **Pesticide Management Program** | (604) 582-5200 | **Medical Health Officer** | (604) 736-2033 |
| **Environment Canada** | (604) 666-6100 | **Workers Compensation Board** | 1-800-661-2112 (after hours (604) 273-7711) |

## Appendix 1: DEFINITIONS

***Environment*** *– "means the air, land, water and all other external conditions or influences under which man, animals and plants live or are developed."*

***BC Environmental Management Act, 2003***

***Dangerous Goods –****"means a product, substance or organism included by its nature or by the regulations in any of the classes listed in the schedule to the Canada Dangerous Goods Act"*

***Canada Transportation of Dangerous Goods Regulations, 2003***

***Deleterious Substance*** *-*

*1(a)"any substance that, if added to any water, would degrade or alter or form a part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water, or*

*(b) any water that contains a substance in such quantity or concentration, or that has been so treated, processed or changed, by heat or other means, from a natural state that it would, if added to any other water, degrade or alter or form part of a process of degradation or alteration of the quality of that water so that it is rendered or is likely to be rendered deleterious to fish or fish habitat or to the use by man of fish that frequent that water,*

*and without limiting the generality of the foregoing includes*

*(c) any substance or class of substances prescribed pursuant to paragraph 2(a),*

*(d) any water that contains any substance or class of substances in a quantity or concentration that is equal to or in excess of a quantity or concentration prescribed in respect of that substance or class of substances pursuant to paragraph 2(b), and*

*(e) any water that has been subjected to a treatment, process or change prescribed pursuant to paragraph 2(c)."*

*The Governor in Council may make regulations prescribing:*

*2(a) substances and classes of substances,*

*(b) quantities or concentrations of substances and classes of substances in water, and*

*(c) treatments, processes and changes of water*

*for the purpose of paragraphs 1(c) to (e) of the definition "deleterious substance" in subsection (1).*

***Canada Fisheries Act, s.34, 1985***

*Note that aside from toxic chemicals, deleterious substances have been found to include such things as sediment, which has been shown to impede a fish's ability to catch prey and to affect its gills.*

***Hazardous Material*** *– "means any prohibited product, restricted product, controlled product or special waste."*

***Responsible Person*** *– "any person who had possession, charge or control of a substance immediately before its spill."*

***BC Environmental Management Act - Spill Reporting Regulation, 1993.***

***Spill*** *– "means a release or discharge … into the environment of a substance in an amount equal to or greater than the amount listed …"*

***BC Environmental Management Act - Spill Reporting Regulation, 1993***

**Appendix 2:**

# *UBC SPILL REPORTING FORM*

## REPORTABLE SPILLS or RELEASES ONLY

**Fax to Health, Safety & Environment, (604) 822-6650**
**(phone number (604) 822-2029)**
**Copy to be forwarded to Administrative Head of Unit**

**EMERGENCY RESPONSE INITIATED**

YES ☐ NO ☐

Name _____

Dept. _____

Phone number _____

Address _____

_____

_____

Material spilled _____

_____

_____

Quantity _____

Location _____

_____

_____

Date & time of spill _____

Description of spill, including cause and actions taken _____

_____

_____

_____

_____

_____

_____

Agencies attending scene (e.g. Fire Dept. etc)

_____

_____

_____

_____

Agencies notified of spill or release:
(e.g., PEP at 1-800-663-3456)

_____ Time_____

_____ Time_____

_____ Time_____

Please include any additional information on a separate sheet.

## Appendix 3: Classification of Dangerous Goods

Refer to the Canada *Transportation of Dangerous Goods Acts, 1992, schedule II for a complete list of substances.*
Note: The class number is the first number, the second number is the division number, e.g., 5.2 means class 5, division 2).

| | |
|---|---|
| **Class 1** | **Explosives** |
| 1.1 | A substance or article with a mass explosion hazard |
| 1.2 | A substance or article with a fragment projection hazard, but not a mass explosion hazard |
| 1.3 | A substance or article that has a fire hazard along with either a minor blast hazard or a minor projection hazard or both, but not a mass explosion hazard |
| 1.4 | A substance or article that presents no significant hazard – explosion effects are largely confined to the package and no projection or fragments of appreciable size or range are to be expected. |
| 1.5 | A very insensitive substance that nevertheless has a mass explosion hazard like those substances in 1.1. |
| **Class 2** | **Gases** |
| 2.1 | A flammable gas |
| 2.2 | Other compressed gases |
| 2.3 | A poisonous gas |
| **Class 3** | **Flammable and combustible** liquids A liquid with a closed-cup flask point between -18oC and61oC |
| **Class 4** | **Flammable solids, substances liable to spontaneous combustion, and substances that on contact with water emit flammable gases** |
| 4.1 | A solid that under normal conditions of transport is readily ignitable and burns vigorously and persistently or that causes or contributes to fire through friction or from heat retained from manufacturing or processing |
| 4.2 | A substance liable to spontaneous combustion when in contact with air or liable to spontaneous heating to the point where it ignites when in contact with air |
| 4.3 | A substance that on contact with water is liable to become spontaneously flammable or emit flammable gas(es) |
| **Class 5** | **Oxidizing substances and organic peroxides** |
| 5.1 | A substance that causes or contributes to the combustion of other material by yielding oxygen or other oxidizing substances whether or not the substance itself is combustible |
| 5.2 | An organic compound that contains a strong oxidizing agent in the form of the bivalent "-O-O-" structure and, therefore, may be liable to explosive decomposition or sensitive to heat, shock, or friction |
| **Class 6** | **Poisonous (toxic) substances and infectious substances** |
| 6.1 | A solid or liquid that is poisonous through inhalation of its vapours, by skin contact, or by ingestion |
| 6.2 | Organisms that are infectious or that are reasonably believed to be infectious to humans and animals |
| **Class 7** | **Radioactive materials** |
| **Class 8** | **Corrosive substances** |
| **Class 9** | **Miscellaneous products, substances, or organisms dangerous to life, health, property, or the environment** |

## Appendix 4: CANADIAN ENVIRONMENTAL PROTECTION ACT Schedule 1 – List of Toxic Substances

| | |
|---|---|
| 1 | Chlorobiphenyls that have the molecular formula $C_{12}H_{10-n}Cl_n$ in which "n" is greater than 2 |
| 2 | Dodecachlorophentacyclo ($5.3.0.0^{2,6}.0^{3,9}.0^{4,8}$) decane |
| 3 | Polybrominated Biphenyls that have the molecular formula $C_{12}H_{10-n}Br_n$ in which "n" is greater than 2 |
| 4 | Chlorofluorocarbon: totally halogenated chlorofluorocarbons that have the molecular formula $C_nCl_xF_{(2n+2-x)}$ |
| 5 | Polychlorinated Terphenyls that have a molecular formula $C_{18}H_{14-n}Cl_n$ in which "n" is greater than 2 |
| 6 | Asbestos |
| 7 | Lead |
| 8 | Mercury |
| 9 | Vinyl Chloride |
| 10 | Bromochlorodifluoromethane that has the molecular formula $CF_2BrCl$ |
| 11 | Bromotrifluoromethane that has the molecular formula $CF_3Br$ |
| 12 | Dibromotetrafluoroethane that has the molecular formula $C_2F_4Br_2$ |
| 13 | Fuel containing toxic substances that are dangerous goods within the meaning of section 2 of the Transportation of Dangerous Goods Act and that<br>(a) are neither normal components of the fuel nor additives designed to improve the characteristics or the performance of the fuel; or<br>(b) are normal components of the fuel or additives designed to improve the characteristics or performance of the fuel, but are present in quantities or concentrations greater than those generally accepted by industry standards. |
| 14 | Dibenzo-para-dioxin that has the molecular formula $C_{12}H_8O_2$ |
| 15 | Dibenzofuran that has the molecular formula $C_{12}H_8O$ |
| 16 | Polychlorinated dibenzo-para-dioxins that have the molecular formula $C_{12}H_{(8-n)}O_2Cl_n$ in which "n" is greater than 2 |
| 17 | Polychlorinated dibenzofurans that have the molecular formula $C_{12}H_{(8-n)}OCl_n$ in which "n" is greater than 2 |
| 18 | Tetrachloromethane (carbon tetrachloride $CCl_4$) |
| 19 | 1,1,1-trichloroethane (methyl chloroform, $CCl_3$-$CH_3$) |
| 20 | Bromofluorocarbons other than those set out in items 10 to 12 |
| 21 | Hydrobromofluorocarbons that have the molecular formula CnHxFyBr(2n+2-x-y) in which 0<n<=3 |
| 22 | Methyl Bromide |
| 23 | Bis(chloromethyl) ether that has the molecular formula $C_2H_4C_{l2}O$ |
| 24 | Chloromethyl methyl ether that has the molecular formula $C_2H_5ClO$ |
| 25 | Hydrochlorofluorocarbon (HCFC) |

## Appendix 4: CANADIAN ENVIRONMENTAL PROTECTION ACT Schedule 1 – List of Toxic Substances

| | |
|---|---|
| 26 | Benzene – molecular formula $C_6H_6$ |
| 27 | Cyclopropylmethanone (4-cyclophenyl) O-[(4-nitrophenyl)methyl]oxime ($C_{17}H_{15}ClN_2O_3$) |
| 28 | 1,2-Dichloroethane |
| 29 | 3,3'-Dichlorobenzidine |
| 30 | Benzidine |
| 31 | Bis(2-ethylhexyl)phthalate |
| 32 | Chlorinated wastewater effluent |
| 33 | Creosote-impregnated water materials from creosote-contaminated sites |
| 34 | Dichloromethane |
| 35 | Effluent from pulp mills using bleaching |
| 36 | Hexachlorobenzene |
| 37 | Hexavalent chromium compounds |
| 38 | Inorganic arsenic compounds |
| 39 | Inorganic cadmium compounds |
| 40 | Inorganic fluorides |
| 41 | Oxidic, sulphidic and soluble inorganic nickel compounds |
| 42 | Polycyclic aromatic hydrocarbons |
| 43 | Refactory ceramic fibre |
| 44 | Tetrachloroethylene |
| 45 | Trichloroethylene |

## Revisions R01:

- 27 Environmental Canada – Canadian Environmental Protection Act – Schedule 1 – List of Toxic Substances added.
- Updated Table 1 to include Corrosive materials of Class 8
- Grammatical change
- No change in procedure

## Revisions R02:

- Changed name from "Spill" to" Environmental" Reporting Procedures
- Updated Table 1 to remove Division 4 of Class 2 and Divisions 1, 2 & 3 of Class 9 (as amended in latest revisions to the Canada Transportation of Dangerous Goods Regulations in 2003)
- Corrections and updates to Appendix 1 DEFINITONS (BC Waste Management Act and BC Environment Management Act combined and updated to BC Environmental Management Act in 2003)
- Modified Appendix 2 to include PEP Phone number
- Updated Table 3 to remove Division 4 of Class 2, Divisions 1, 2 & 3 of Class 9
- Updated overall format