

Hazardous Material Management Plan

11.12.56.1 Rev. 3

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Revision History

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0	2002-07-12	Incorporated comments – changed the waste disposal procedure to the Material Management Plan	Allen Hodges
1	2002-10-02	Number change from Chemical/Biosafety area to Hazardous Material Management area	Allen Hodges
2	2007-02-08	Review and implement changes required for Canada Labour Code Part II and Canada Occupational Health & Safety Regulations	Kelvin Kliewer
2A	2008-04-08	Added biological waste requirements, bibliography, updated procedure section and changed reviewers.	Corrine Harris
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1.0 PURPOSE

The Canadian Light Source Inc. (CLSI) is committed to the proper management of hazardous waste generated at the facility. Proper management of hazardous wastes will minimize the risk to the general public, the environment, and the financial cost to the CLSI. It is the purpose of this document to provide information on the proper storage, handling, transport and disposal of hazardous waste.

2.0 BACKGROUND

Hazardous materials management must be done in a manner that is conducive to the maintenance of the safety and health of all employees and in accordance with current legislation, regulations and approved procedures. All CLSI hazardous waste is disposed of through the University of Saskatchewan (U of S) Waste Management Facility (WMF). This document is in compliance with the U of S *Hazardous Waste Disposal Manual* [1].

3.0 APPLICATION REQUIREMENTS

3.1 PERSONNEL QUALIFICATION

All personnel working with chemicals must have successfully completed the CLSI WHMIS (Workplace Hazardous Material Information System) course and any other required training. All personnel working with biological materials categorized as Risk Group Level (RGL) 2 as defined in the CLSI *Biosafety Guidelines* [2] or live animals must take the CLSI General Biosafety Training (GBT) module prior to working with this material at the facility.

3.2 GENERAL PRECAUTIONS, LIMITATIONS AND CONSTRAINTS

As a general principle, *no* hazardous wastes are to be disposed via sinks, drains or regular garbage unless specific approval has been given by the Health, Safety and Environmental (HSE) Manager or designate. This restriction is necessary because many materials are harmful to:

- The environment (e.g., heavy metals such as cadmium, lead, mercury and compounds which are biocidal);
- The municipal sewage system (e.g., acids of pH<5.5 and alkali of pH>9.0 and biocides);
- The plumbing systems (e.g., corrosives);
- The security of the building (e.g., flammable solvents that may pose a fire or explosion hazard); or
- Building occupants (e.g., Volatile toxic fumes).

4.0 WASTE HANDLING

4.1 WASTE CATEGORIES

There are three general categories of hazardous waste generated at the CLS; chemical, biological, and penetrable (i.e., sharps).

Chemical

At the CLS chemical waste is further segregated into 5 categories; halogenated solvents, non-halogenated solvents, acidic solutions (pH < 6.0), alkaline solutions (pH>8.0), and solid contaminated waste.

Biological

Biological waste includes; microbiological (e.g., petri dishes, plates, gloves, loops etc.), animal associated material (carcasses, tissue, bedding, excrement, blood/ body fluids) and human material (blood, body fluids). Biological waste is collected and segregated based on whether there is contamination present or not. If biological material is designated as RGL2 or higher, it is deemed biohazardous/infectious and must be disposed of accordingly. All human material (blood, body fluids, tissue) is automatically categorized as RGL 2 (biohazardous) and animal material can either be RGL1 (originating from a healthy animal) or RGL2 (diseased or infected with a RGL2 pathogen).

Penetrable

This category of waste includes any items that have the capability of puncturing a plastic waste bag. The sharps may be contaminated with biological or chemical material, but are collected in the same approved sharps container as per the instructions following in this document.

It is important that the three categories and different types of waste are segregated, collected and stored properly before disposal.

4.2 WASTE MINIMIZATION

The disposal of hazardous material is costly; therefore every effort should be made to minimize waste generation as much as is practicable by:

- Purchasing minimal quantities necessary for intended use
- Reducing the scale of experiments or analyses by use of micro procedures
- Replacing hazardous materials with less hazardous materials
- Separating hazardous material from less hazardous wastes to reduce the volume
- Treating wastes to make them less hazardous (e.g., neutralizing acids/bases, decontaminating microorganisms)
- Exchanging surplus chemicals
- Purifying and reusing chemicals

4.3 WASTE CONTAINERS

The proper waste containers must be used and labeled. All hazardous waste containers must have a numbered hazardous waste label fixed to the waste container. CLSI HSE ensures that the proper chemical waste containers are labeled and placed in the laboratories for Users. Approved biohazardous autoclave bags and waste containers are at the Users expense and must be approved and labelled by CLSI HSE prior to use.

Sharps

- Approved sharps container (i.e., leak-proof, puncture resistant container, with a mouth circumference not large enough to reach into)
- Sharps container must have a fill line, a sharps label and a biohazard label if the sharps are contaminated with biohazardous material.

- Non-contaminated broken glass can be disposed of using a labeled and plastic lined cardboard box; when box is full all seams must be taped shut with durable tape and the box can be disposed of with normal waste.

Animal Tissues and Carcasses

- Approved plastic lined cardboard boxes.

Contaminated Microbiological Waste and Animal Bedding

- Leak proof plastic transport container lined with an autoclave bag labelled with a biohazard symbol.

4.4 WASTE COLLECTION

- Appropriate personal protective equipment (PPE) and engineering controls (i.e., fumehood, biosafety cabinets (BSCs) must be used as per MSDSs and Permit controls specified
- Collect waste in appropriate labeled containers and fill out the CLSI *Hazardous Waste Disposal Form* [3].
- Store wastes in appropriate locations (e.g., well ventilated area, contained, or at proper temperatures)
- All liquids must be stored in containment trays to contain a leak
- Ensure all lids and caps are securely placed and tightened on containers. Proper caps and lids must be used. Corks or rubber stoppers should not be used as substitutes.
- Biological tissues (including animal carcasses) should be placed in leak proof primary and secondary containers (bags) and placed in a freezer until they are removed from premises for disposal.

4.5 WASTE REMOVAL

- Many compounds such as biological buffers, detergents and routine biological materials such as proteins, lipids, carbohydrates and nucleic acids that are not considered hazardous to the environment may be disposed through the sewage system or landfill site.
- Salts can be diluted with water and disposed into the sewer unless they are environmentally harmful or part of a mixture, which is inappropriate for sewer disposal.
- Contaminated (biohazardous) waste must be chemically inactivated or transported to an approved facility for proper disposal. If CLSI purchases an autoclave for the facility this plan will be amended to reflect that.
- If biohazardous waste has been inactivated by chemical inactivation; deface the biohazard symbol on waste bag (if one is present), place in a black garbage bag and dispose of in regular garbage.
- If transporting biohazardous waste to an approved location for inactivation; ensure all waste is sealed in the autoclave bag, placed in the approved labelled transport container and proceed with section 5.0.
- Biological tissues should only be removed from their storage location (i.e., freezer), and placed in the proper transport container on the day of pick up from the U of S Waste Management Facility (WMF).

- CLSI HSE coordinates and arranges the pickup of all hazardous material through the U of S.

Note: Only laboratory wastes that are known to be non-hazardous may be disposed of through the sewage handling system or landfill site.

5.0 PROCEDURE

5.1 HAZARDOUS WASTE DISPOSAL

- 5.1.1 All categories of chemical waste have a specific waste container located within the fumehood in each laboratory.
- 5.1.2 Dispose of chemicals in the appropriate containers as generated.
- 5.1.3 Complete CLSI *Hazardous Waste Disposal Form* [3] applicable to the specific type of waste generated. These forms are located in a plastic protective cover above each fumehood.
- 5.1.4 These forms are specific to type of waste and must include the name, volume, and % concentration of each hazardous chemical. The initials of the person generating waste must also be indicated. If solid waste is in trace amounts, deposit the waste and material it was collected on (i.e., paper or absorbent) and place in the proper container.
- 5.1.5 HSE monitors waste container levels and provides replacement containers as required. If a container is full; contact HSE.
- 5.1.6 If biological waste is generated notify the CLSI HSE department when the material is ready for pickup.
- 5.1.7 The CLSI HSE Department will complete the necessary external forms and arrange for pickup and disposal of the waste through the U of S.

6.0 BIBLIOGRAPHY

- [1] **University of Saskatchewan.** Hazardous Waste Disposal Manual. 2004.
- [2] **CLSI.** Biosafety Guidelines. *11.1.55.2 Rev 1*. 2008.
- [3] —. Hazardous Waste Disposal Form. *11.11.56.2 Rev 2*. 2008.