



Biohazardous Waste Treatment & Disposal



It is the responsibility of **Principal Investigators to ensure all autoclave users and responsible persons have been appropriately trained** and follow the proper procedure.

Purpose

This procedure describes the autoclave treatment conditions and requirements for laboratory solid waste contaminated with Risk Group 1 and 2 Biohazardous Materials (Category B Infectious Substances) in academic research laboratories at UBC Point Grey Campus. This treatment will allow the safe management of such waste as non-hazardous solid waste in accordance with applicable legislation and the delisting protocol approved by the Ministry of Environment (MOE).

If you produce any microbiological laboratory waste, UBC requires that you follow this procedure to be eligible for core-funded, central waste disposal. Departments who fail to follow this procedure will be required to self-fund their biohazardous waste disposal.

Scope

Waste Application & Regulations

This procedure applies to all microbiological laboratory waste, as defined by the BC Hazardous Waste Regulation and includes all biohazardous materials/agents in Risk Groups 1 and 2, such as:

- Human or animal cell cultures used in research
- Live or attenuated vaccines
- Plant viruses, bacteria and fungi
- Stocks of specimens of micro-organisms including Bacteria, Viruses, Fungi, Parasites, Rickettsiae and Chlamydiae
- Laboratory material that has come into contact with any of the above

This procedure follows the guidelines set by the most recent Canadian Biosafety Standards and Guidelines, published by the Public Health Agency of Canada. Refer to the UBC Safety & Risk Services Biosafety Reference Manual for further details on definitions, procedures, management of biohazardous materials, and Risk Group classifications.

Segregation Required

Proper segregation of biohazardous versus non-biohazardous waste is essential in reducing the volume and cost of handling biohazardous waste.

Contact the **SRS Advisor, Biological & Radiation Safety** for risk group classification of biological agents and review relevant information in your approved biosafety protocol.



Does Not Apply

This procedure does NOT apply to the disposal of:

- Biohazardous waste of Risk Group 3 biological agents and prions, as defined in the most recent Canadian Biosafety Standards and Guidelines, for which special procedures apply.



- Genomic DNA/RNA and DNA/RNA contaminated solid waste. Recombinant DNA/RNA must be chemically treated prior to garbage disposal.
- Toxins of infectious substances, including toxins defined by the Human Pathogens and Toxins Act
- Biomedical waste, which consists of human anatomical parts, or human blood and body fluids – see “Biomedical Waste” procedure
- Animal waste (e.g. animal tissues, organs, body parts, carcasses) – see “Animal Carcasses” procedure
- Invasive species – see “Non-Indigenous Species” procedure
- Animal bedding waste – see “Animal Bedding” procedure
- Laboratory glass waste – see “Laboratory Glass Waste” procedure
- Laboratory waste that is NOT biohazardous, as defined in this procedure, and can be disposed as solid waste via regular garbage. Examples of such waste include uncontaminated gloves, wrappers, packaging material, plastics and labware.
- Laboratory plastic containers that have not contained any biohazardous materials and may be acceptable for recycling.

Background

The BC Hazardous Waste Regulation, 2009 and the Metro Vancouver Tipping Fee and Solid Waste Disposal Regulation Bylaw No. 263, 2012 prohibit the disposal of untreated biohazardous waste to landfills. This prohibition is necessary, as there are no “safe” levels of non-contained pathogenic organisms. All biohazardous organisms MUST be rendered harmless by approved methods before being released into the environment.

Procedure

Contact our **ESF Technicians** for any questions related to the treatment or processing of autoclaved materials (RG 1 or 2).



Laboratory Treatment of RG1 and RG2 Waste

- ✓ Collect laboratory solid waste contaminated with RG1 and RG2 bio-hazardous materials and place in **CLEAR autoclave bags without any markings**.
 - Use heavy-duty (minimum 2MIL thick) transparent (clear) plastic autoclave bags available from various scientific vendors.
 - ESF will NOT accept coloured bags (orange) with biosafety logos – waste appears “biohazardous” and is not acceptable at the local landfill or waste-to-energy facility.
- ✓ Loosely close bag using autoclave tape (chemical indicator).
- ✓ **Autoclave all waste for 60 minutes at 121°C and 15 psi**
 - Changing the autoclave parameters (time, temperature and pressure) for waste treatment is NOT acceptable as it contravenes MOE specific conditions for UBC’s waste delisting permit.
- ✓ Confirm that the chemical indicator has turned black at the end of the autoclave cycle.
- ✓ All autoclaved waste MUST be double bagged. Triple bag waste if necessary.
- ✓ Ensure bags do NOT leak. Leaking bags will be refused for pick-up.
- ✓ Ensure that each bag does not weigh more than **10 kg**.



- ✓ Attach to each autoclave bag a **Biological Waste Disposal Tag (Red)** shown below.
- ✓ Indicate “**Autoclaved Risk Group 1 or 2**” as appropriate on the tag.
- ✓ Affix your generator barcode sticker on the tag.
- ✓ Place the bag in your building’s hazardous waste collection area.
- ✓ Record the autoclave cycle details on the autoclave log: i.e. treatment date, autoclave cycle duration, temperature and pressure.
 - Keep your autoclave chart readouts on file – see sample “Autoclave Log”.



Required Autoclave Equipment Monitoring

- ✓ The participating laboratory **MUST** verify autoclave treatment efficacy by completing monthly testing with biological indicators to demonstrate adequate sterilization.
 - Use only **Self-Contained Biological Indicators for Steam Sterilization**, such as EZTest® BIs by Mesa Labs, or equivalent that fit the prescribed treatment.
 - Act on a positive test (color change) as soon as the color change is noted. Color change is to be interpreted as “inadequate sterilization.” If necessary, repeat the test and record the results.
 - Keep your autoclave chart readouts on file - see sample “Autoclave Log” below.
 - Inform ESF immediately if the biological indicator test has not been successful.
- ✓ The autoclave room must be inspected monthly to ensure area is free of spill, kept clean and tidy (e.g. waste bags placed in secondary containers), autoclave logs are accurately kept, autoclave charts are available (and kept on file for 3 years), and autoclave efficiency is tested and recorded – see sample “Monthly Inspection Checklist”.
- ✓ The autoclave room responsible person must complete:
 - Biological indicator testing
 - Monthly inspections
 - Online monthly reporting vi the Hazardous Waste Inventory System (HWIS)
 - Participation in an annual audit by SRS staff and/or an external auditor



Waste Characterization Monitoring

- ✓ At the time of collection, ESF Technicians will inspect waste packaging and labeling for integrity and accuracy of accompanying information.
- ✓ ESF Technicians ensure that **ONLY** packages that meet requirements will be collected for disposal. Waste packages that do not meet requirements will be sent back to the generator for correction and/or further treatment.
- ✓ Biohazardous waste that was not treated following the approved UBC protocol cannot be disposed of as delisted solid waste. ESF will ship this RG1/RG2 waste direct to an approved hazardous waste facility with the costs borne by the waste generator.
 - Common reasons: autoclave unit was missing/under repairs, autoclave was not approved by SRS, autoclave failed chemical/biological test, waste was improperly packaged (e.g. orange bags with biohazard logos or bags with sharps), etc.



Biological Waste Disposal Tag



BIOLOGICAL WASTE DISPOSAL

The University of British Columbia, Environmental Services Facility

Parcel Identification No:

BIOLOGICAL WASTE DISPOSAL



Parcel Identification No:

GENERATOR TO COMPLETE THIS SECTION ONLY

AFFIX IDENTIFICATION BARCODE LABEL HERE

WASTE CONTENT

Autoclaved Risk Group 1 Autoclaved Risk Group 2

BIOMEDICAL

Animal Carcasses Uncontaminated Animal Carcasses Contaminated

Animal Blood & Body Fluids Sharps

Human Anatomical Pharmaceuticals (non-narcotic)

Human Blood & Body Fluids Controlled drugs (destroyed)*

Primates* Contaminated solid waste*

Other * _____

* Contact ESF

Office use only:

Weight _____ Kg



Environmental Services Facility (ESF)
Phone 604.822.1285



Autoclave Facility Monthly Inspection Checklist

Building name: Room #:	
Unit Serial #: Autoclave Brand & Model:	
Inspection date	
Inspector's contact information: <ul style="list-style-type: none"> • Name • Phone • E-mail 	

Instructions:

1. Complete inspection on a monthly basis.
2. Inspect each item on the checklist and check **Yes** box (✓) if satisfactory or **No** if unsatisfactory.
3. For unsatisfactory items, describe the deficiency in the Comments section.
4. Take prompt action or make necessary recommendations to correct deficiencies.
5. Submit a copy of the completed checklist to SRS at the end of each month, via the online HWIS Autoclave Reporting. For questions, contact ESF at 604-827-5389.

Checklist Items	Yes	No	Comments
1. Does the room/floor/building have controlled access?	<input type="checkbox"/>	<input type="checkbox"/>	
2. Is the area inspected monthly?	<input type="checkbox"/>	<input type="checkbox"/>	
3. Record of inspection is up-to-date?	<input type="checkbox"/>	<input type="checkbox"/>	
4. The area is free of spills and leaks?	<input type="checkbox"/>	<input type="checkbox"/>	
5. Autoclave cycles are recorded on autoclave logs?	<input type="checkbox"/>	<input type="checkbox"/>	
6. Autoclave Charts are kept on file?	<input type="checkbox"/>	<input type="checkbox"/>	
7. Written autoclave logs contain all required information?	<input type="checkbox"/>	<input type="checkbox"/>	
8. Has the autoclave been tested with biological indicators (BI) monthly? If Yes, provide BI test date (mm/dd/yyyy) & test tube serial #.	<input type="checkbox"/>	<input type="checkbox"/>	
9. Was the test successful this month?	<input type="checkbox"/>	<input type="checkbox"/>	
10. Were the BI test parameters (temperature=121°C, time=60min, pressure=15psi) noted on the autoclave log?	<input type="checkbox"/>	<input type="checkbox"/>	
11. Have all autoclave users & responsible persons been properly trained?	<input type="checkbox"/>	<input type="checkbox"/>	
Inspector's signature			