



Waste Information and Procedures for Bio Labs:

These procedures should be incorporated into your written SOPs (general tissue culture, etc.) and all personnel must be trained on your lab's waste procedures. This training must be documented and proficiency in the procedures verified.

Note: the procedures outlined below may need to be modified if for example the biological waste was also contaminated with chemicals or radioisotopes.

a) RG1 liquid waste: treat with a final of 1 % sodium hypochlorite for a minimum of 30 minutes or use disinfectant and contact time that is based on experimental validation of efficacy for your specific bio agent, before disposal into the sink. Or autoclave at 121 degrees Celsius for at least 20 minutes, once cooled dispose by pouring down sink. Do not autoclave bleach.

b) RG1 solid waste: autoclave at 121 degrees Celsius for at least 20 minutes and then dispose as regular garbage or as directed by Environmental Protection Service (EPS).

c) RG2 liquid waste: treat with a final of 1 % sodium hypochlorite for a minimum of 30 minutes before disposal into the sink or use disinfectant and contact time that is based on experimental validation of efficacy for your specific bio agent. Appropriate decontamination procedures can be obtained from product information sheets, Pathogen Safety Data Sheets (PSDS), etc. It is important to ensure that the appropriate dilution of the active ingredient (for example sodium hypochlorite in bleach) is used to decontaminate liquid waste and the contact time for complete decontamination is achieved.

d) RG2 solid waste: place in yellow biohazard buckets lined with yellow bags provided by EPS (see below for contact information)

e) Viral vectors and aerosolisable bioagents require more stringent waste procedures. All contaminated material (both liquid and solid (ex pipet tips, tubes, flasks, plates etc.)) must be fully decontaminated within the BSC prior to removal using the appropriate disinfectant (i.e. final 1% sodium hypochlorite or other suitable disinfectant as determined by the permit holder's risk assessment based on information from product sheets or PSDSs). Solid waste should have a contact time with the disinfectant of a minimum of 30 minutes. Disinfectant is then to be poured off and solid waste placed in biohazardous waste containers supplied by EPS. For any liquid waste follow the instructions above for RG2 liquid waste.

f) DNA Staining reagents (e.g. ethidium bromide, Redsafe): gels, tips and buffers to be disposed as chemical waste. Local municipal laws do not allow for disposal down drains.

g) Toxins and Human tissues: Some biologicals (medical waste) and some toxins for example cholera toxin, require incineration. There are designated incineration waste containers supplied by EPS for these agents and any material contaminated with them. If working with human tissue or toxins contact the Manager of Environmental Protection Service (EPS) for instructions (see below for contact information).

h) Animal tissues need to be returned to the animal facilities for incineration. Contact your animal facility for instructions and waste containers.

i) Plant pathogens/pests listed by the Canadian Food Inspection Agency (CFIA) and any material contaminated with them (plants, soil, pots etc.) though designated as RG1 is to be disposed of as RG2 material. Contact EPS for instructions and waste containers. For a list of Pests Regulated by Canada:

<http://www.inspection.gc.ca/plants/plant-pests-invasive-species/pests/regulated-pests/eng/1363317115207/1363317187811>

j) GMOs: All genetically modified organisms (GMOs) including any invertebrates, plants and any of their products (i.e. germ cells – pollen, spores, etc.) must be rendered non-viable before disposal. Discuss your waste procedures with your HSO, a risk assessment must be completed by the investigator.



k) Non-Native Species: Any non native organisms including any invertebrates, plants or their products must not be released into the environment. Discuss your waste procedures with your HSO, a risk assessment must be completed by the investigator.

l) Soil: All untreated soil that is foreign (from any other country) and from regulated areas in Canada must be sterilized prior to disposal. See CFIA directive D-95-26 for more information and approved sterilization methods. Discuss your disposal procedures with EPS. <http://www.inspection.gc.ca/plants/plant-pests-invasive-species/directives/date/d-95-26/eng/1322520617862/1322525442569#a15d>

m) All other waste (e.g. chemical, radioisotopes) or if you have any questions about mixed waste:

To set up a pickup service and request chemical/biological waste buckets call the Environmental Protection Technicians (EPTs) directly at 946-3473 or email hazwaste.ehs@utoronto.ca . If you have any questions on hazardous material disposal/waste, please contact Rob Provost (rob.provost@utoronto.ca) the Manager of our Environmental Protection Service (EPS).

EPS website: <https://ehs.utoronto.ca/our-services/environmental-protection-services/>

There is a summary guide for the packaging and handling of hazardous and nonhazardous waste here:

<https://ehs.utoronto.ca/laboratory-hazardous-waste-management-and-disposal-manual/summary-guide-for-packaging-handling-hazardous-waste/>

Training on Hazardous Waste Management at UofT:

A short online course (EHS803) is available. This course is meant to help you get an understanding of how Chemical, Radiation and Biological wastes are handled at University of Toronto including supplies and services available, plus where to get more information and have questions answered. For information about taking this course please go to:

<https://ehs.utoronto.ca/our-services/environmental-protection-services/eps-training-presentations/>

Some quick facts about Bleach:

1. Active ingredient is sodium hypochlorite.
2. Bleach stocks come in a variety of different concentrations of sodium hypochlorite, from as low as 3% up to 12% for some industry brands.
3. Lab members MUST know the concentration in their stock to be able to calculate the final dilution of sodium hypochlorite. For example, if your bleach stock is 6% then 100 ml. of bleach stock can be added to 500 ml. of fluid to result in 600 ml. of 1% sodium hypochlorite (dilution often used for spills). Lab SOPs should state the final dilution of sodium hypochlorite required for disinfection NOT the % of bleach (since bleach stocks are so variable).
4. Diluted bleach breaks down very quickly and must be remade fresh every 24 hours.
5. Bleach is very corrosive, if using 0.5% or higher of sodium hypochlorite to disinfect surfaces then be sure to rinse them after the required contact time (usually 20 – 30 minutes depending on organism).
6. Bleach must never be autoclaved (can cause chlorine gas to be released).

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