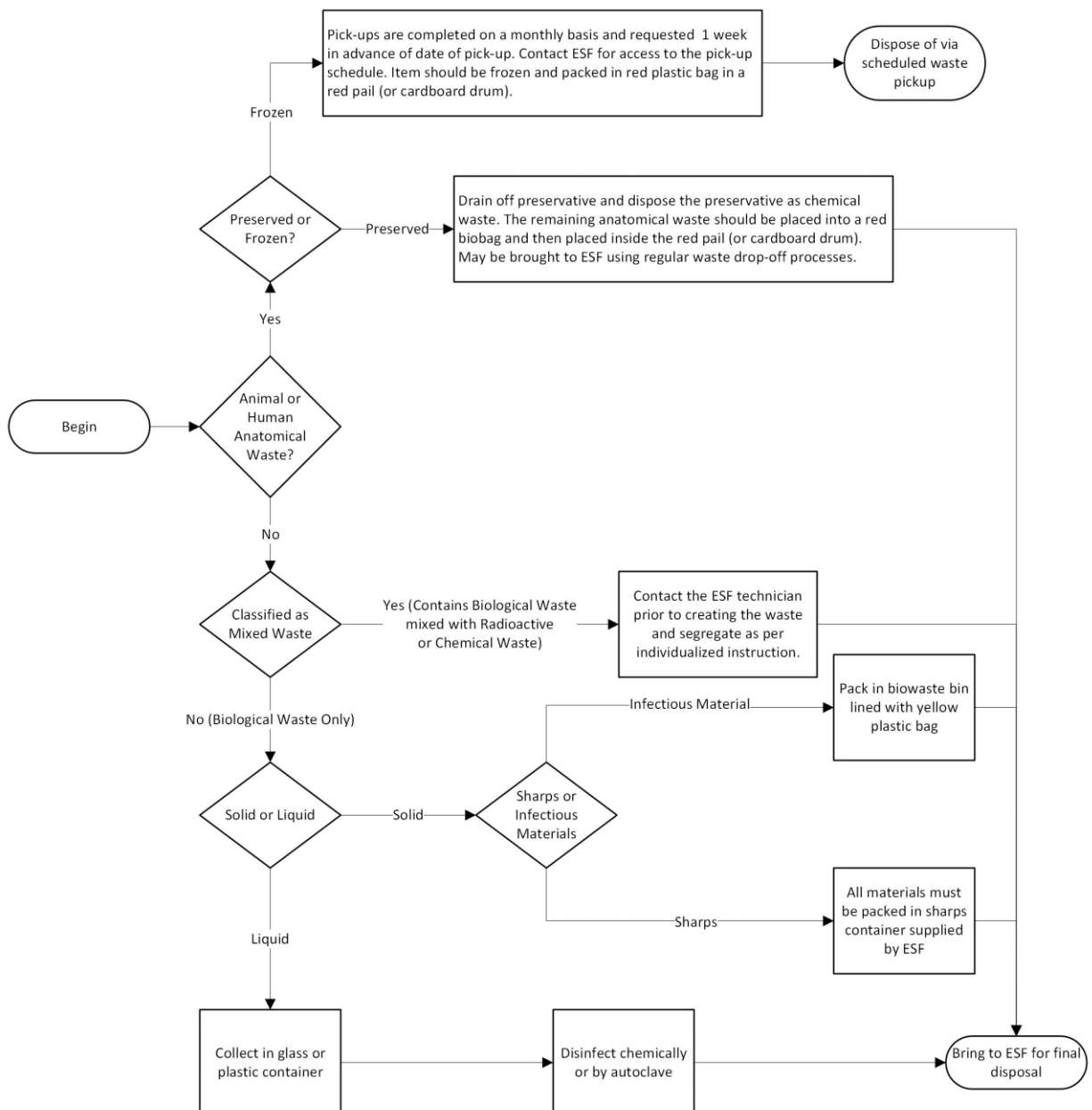


# BIOLOGICAL WASTE SEGREGATION GUIDELINE

Segregation, proper identification, and proper packaging allow for the safe and environmentally responsible disposal of hazardous biological wastes.

## Waste Segregation and Disinfection

The flowchart below provides a summary of how biological waste is to be segregated. If after reviewing the flowchart, you are unsure how to classify your waste, please contact the ESF technician at [esf@uwaterloo.ca](mailto:esf@uwaterloo.ca).



## Definitions

### Chemical disinfection

- The appropriate chemical is specific to the active agent. Some considerations include:
  - Presence of organic materials
  - Contact time
  - Concentration
  - Chemical preparation frequency is vital – as materials like bleach and hydrogen peroxide rapidly lose efficacy once exposed to air
  - Compatibility of surfaces or materials with the chemical being used
- Please review the [Chemical Disinfection Guidance](#) prior to chemically disinfecting your liquid biological waste.

### Liquid biological wastes

Liquid biological wastes include used nutrient broths, cell cultures, blood and bodily fluids (animal and human), recombinant or synthetic nucleic acids, and liquids contaminated with these materials. Most liquid biological wastes can be deactivated physically or chemically.

### Physical inactivation (autoclaving)

- Involves exposing the material to elevated temperatures and pressures for a specific amount of time. Some considerations include:
  - There are both dry and wet techniques.
  - Temperatures, pressures, and cycle times are vital to successful inactivation.
  - Positioning in autoclave is also important.
  - Must verify efficacy of inactivation using accepted methods.
- Please review the [Autoclave Guidance](#) and ensure the user is trained on the specific operating procedures of the Autoclave that is to be used.

### Solid biological wastes

Solid biological wastes consist of materials such as gloves, lab coats, paper towels, petri dishes, centrifuge tubes, etc. contaminated with biological wastes. Agar should be allowed to solidify then be treated as solid waste.

At the University of Waterloo, all waste collected in the bio-waste bins lined with yellow bags are sent to a third party for final sterilization and disposal.

## Packaging Biological Waste

### Liquid wastes (blood, bodily fluids, and potentially pathogenic materials)

1. Collect in a 1 L or 4 L container
2. Fill container only 70% of the total volume
3. Ensure container is fully sealed.
4. Bring to ESF for final disposal unless SOPs indicate otherwise (as a result of efficacy monitoring)

### In Laboratory Treatment and Disposal of Liquid Wastes

When a laboratory chooses to dispose of these materials down the drain, the following protocols must be followed:

#### For Blood and Bodily Fluids

1. Use an appropriate disinfectant. Bleach should only be used if disposal is occurring the same day because after 24 hours bleach loses its efficacy. If you don't intend to dispose on the same day as generation, use another disinfectant that is stable over a longer period of time.
2. Remember to **maintain the minimum concentration for inactivation**. If bleach is used, a 1 to 10 ratio of bleach to liquid should be maintained in the container. If you add more material, more bleach needs to also be added.
3. Bleach should be prepared fresh on the day of use.
4. Let sit for a minimum of 30 minutes prior to disposal.
5. Perform efficacy monitoring as per SOPs.

#### For Potentially Pathogenic Materials

1. Determine and document which disinfectant you will be using. If you need assistance determining which disinfectant to use, please review our [Chemical Disinfection Guidance](#).
2. Prepare the disinfectant fresh on the day you will be using it.
3. Ensure that the final concentration in the container is appropriate to achieve inactivation. Remember, anytime you add more waste, you must also increase the amount of disinfectant to maintain the minimum concentration to achieve inactivation.
4. Ensure the contact time for the waste is achieved.
5. Perform efficacy monitoring as per SOPs

**Efficacy monitoring** is the process of proving that your inactivation method is effective. It requires proof that what was done to inactivate the material was successful,

and these efforts must be documented. In other words, you must periodically try to plate your treated liquid waste. If nothing grows, your treatment is successful.

Efficacy monitoring is required unless otherwise approved by the Biosafety Officer and noted in laboratory SOPs as part of the permit application process. If you cannot perform efficacy monitoring, collect your waste, and send it to the ESF for final disposal. If you are unsure, contact biosafety@uwaterloo.ca for guidance.

### **Solid Waste Contaminated with Infectious Materials (medical waste, infectious materials, cultures)**

- All material must be packed in biohazard bins (see images below) with liners supplied by the ESF.
- Bags inside bins must be sealed (tied) and lid secured.
- Bin must not be over packed (14kg max).



### **Sharps (syringes, blades etc. contaminated with biohazardous materials)**

- All material must be packed in sharps containers supplied by the ESF (4L plastic jugs like the image to the right).
- Review the Sharps and Glass Waste Segregation Guideline on the [Hazardous Waste Standard page](#) for more information.



### **Animal (frozen)**

- All animals are to be kept frozen by the researcher.
- Pick up must be arranged in advance. Email [esf@uwaterloo.ca](mailto:esf@uwaterloo.ca) to be added to the schedule.
- All material must be packed in red anatomical bags supplied by the ESF and placed in either a red anatomical waste pail or a cardboard anatomical waste drum.

### **Animal (preserved)**

- All formalin must be drained off and disposed of as chemical waste.

- All material must be packed in anatomical waste bins (see pictures to the right) with red bags supplied by the ESF.
- Bags inside bins must be sealed (tied) and lid secured.
- Bin must not be over packed (14kg max).

