

NJIT

Biological Waste Management for Laboratories



NJIT Environmental Health and Safety Department
Spring, 2017

Biological Waste

- In broad terms, biological waste may be defined as:
 - liquid or solid waste contaminated with infectious or potentially infectious microorganisms
 - tissue culture
 - cell cultures
 - recombinant DNA
 - genetically engineered organisms, plants, or products regulated by the CDC, NIH, USDA/APHIS, or other State and local authorities.
- These materials may be classified by the biosafety level (BL) of the contaminant.
- NJIT laboratories only manipulate materials regulated at BL-1 and BL-2, no waste beyond BL-2 will be generated.
- In terms of hazard assessment, the NJIT Institutional Biosafety Committee considers all human derived materials (e.g., human blood and body fluids, primary human tissue explants and cell lines, as well as commercially obtained human cell lines) at BL-2 containment.
- Human derived material = BL-2.

Treatment and Disinfection of Biological Waste

The CDC/NIH Guidelines require that biological waste be decontaminated prior to disposal.

Typically, adequate disinfection may be achieved by employing either:

- physical means: typically taken to mean **autoclave** processing which employs a combination of time, temperature, and pressure to achieve disinfection; or
- chemical means: the application of a chemical disinfectant with the appropriate properties that, given the necessary contact time, adequate disinfection will be achieved.
 - Typically a concentration of **10% liquid chlorine bleach** (this is a 1:10 solution of liquid household chlorine bleach and water) in direct contact with the waste material for 20 to 30 minutes will be sufficient.
- Potentially contaminated biological waste items are accumulated in the laboratory in red or orange autoclave bags.
- When almost full, these bags are closed, placed in a spill or leak proof tray for transport to the autoclave, if autoclave is located outside the laboratory.
- Autoclave tape or other sterility indicator shall be used to demonstrate that the bag has been adequately disinfected by the autoclave process.
- Spill or leak proof trays made of Nalgene, or other autoclavable material, shall be used in the autoclave to contain any leaking material.

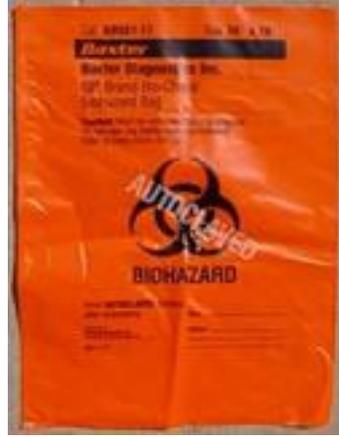
Regulated Medical Waste (RMW)

- Following adequate disinfection, biological waste will be placed into Regulated Medical Waste boxes, lined with red bags, that are supplied by the NJIT EHS Department.
- The **NJIT Medical Waste label** will be applied to all Medical Waste boxes, once the laboratory begins placing waste into the Medical Waste box.
- Once properly sealed, full Medical Waste boxes will be stored in a secure location (typically the laboratory) to await pick up by the EHS Department.
- EHS transports the full boxes of medical waste to a secure accumulation point to await pickup by the Medical Waste vendor.
- Alternatively, full boxes of Medical Waste may also be collected directly from the laboratory by the Medical Waste vendor.
- Medical Waste boxes must have proper labels supplied by the vendor and the NJIT Medical Waste label.
- At the end of the work shift, medical waste boxes must be closed.

Biological Waste Management, Solid Waste



Solid Waste



Collect in
Autoclave
Bags



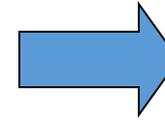
Sharps



Collect in Sharps
Containers



Apply
Indicator
Tape or
Strips and
Label



Autoclave

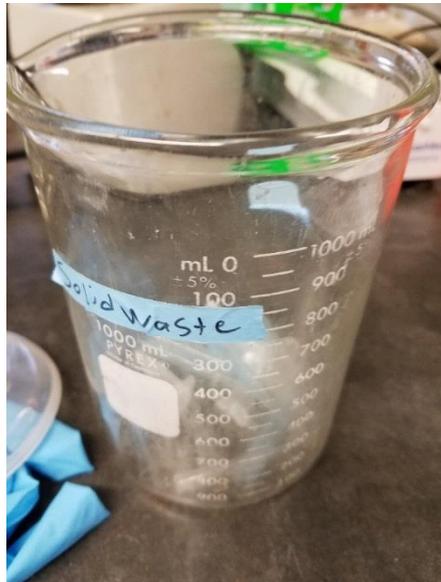
Biological Waste Management, Solid Waste

- Collect solid waste items inside the biological safety cabinet.
- Limit the number of times you remove your hands from the cabinet.
- This limits the disruption of the cabinet's air flow patterns.
- Remember to decontaminate your waste before placing it in the medical waste box.
- The following items require disinfection:
 - all BL-2 waste;
 - all recombinant materials;
 - any biological waste that may be potentially infectious (this includes many BL-1 organisms that are considered opportunistic pathogens); and
 - all human derived materials (primary or commercially obtained).
- These items must be decontaminated before they are removed from the cabinet and placed in the regulated medical waste box.

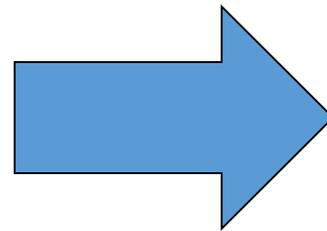


Biological Waste Management, Solid Waste

- Please do not collect potentially contaminated pipette tips, weigh boats, spatulas, and other miscellaneous items in a beaker on the bench and label as “waste”.
- This is a very common violation.
- Biological items may go in a variety of containers and be labeled with the NJIT Biological Waste Label or a container from the manufacturer that is pre labeled.
- Chemically contaminated solid waste items should be collected in a proper container with a lid and labeled with the appropriate chemical waste label.



Improper Container
Improper Label



Appropriate Container, Sealable,
Pre-Labeled

Biological Waste Management - Liquid Waste



Chemical
Disinfection

OR

Physical
Disinfection



OR



Add household
liquid chlorine
bleach to achieve
10% of total
volume. Let
stand 30 minutes.

OR

Autoclave

Carefully drain
dispose with
plenty of water

Collect Liquid Waste

Avoid Autoclaving Flammable, Explosive,
or Potentially Harmful Chemicals

Biological Waste Management - Autoclave

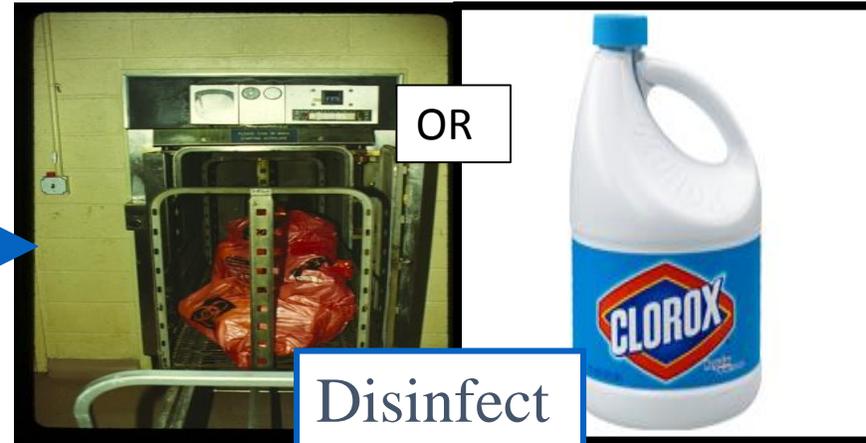


- Autoclaves exert temperature (heat/steam) and pressure to achieve decontamination over time. Typically 121° C at 15 lbs/in² for 60 minutes (complete cycle) are the preferred settings for waste decontamination.
- Once decontaminated waste bags are removed from the autoclave and packaged as Regulated Medical Waste.
- Sealed and labeled boxes of medical waste are collected by the EHS Department and sent for off-site incineration.

Biological Waste Management



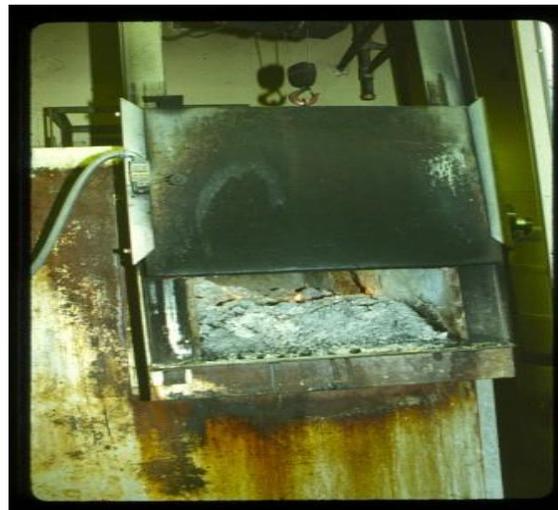
Collect



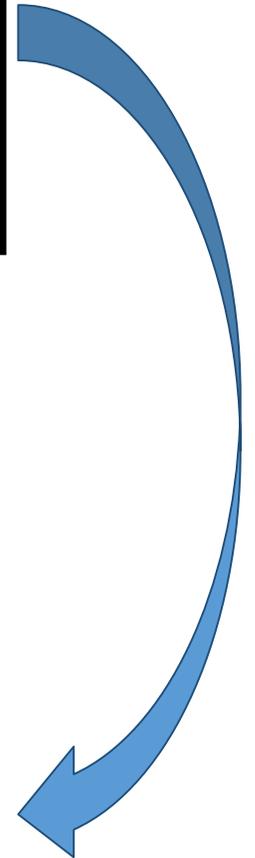
Disinfect



Package and Label as RMW



Off-Site Incineration



Biological Waste Management - Labeling

Biological-Medical Waste

NJIT
New Jersey's Science & Technology University

Waste Removal Date _____

Inner Container Label

Principal Investigator _____ Telephone # _____
Lab Manager _____ Email _____
Building _____ Room # _____

University H... Newark, NJ 07102

Biological-Medical Waste

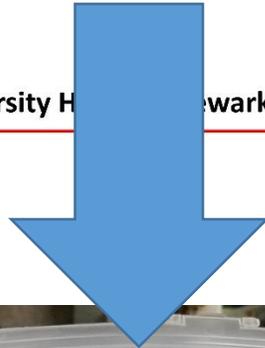
NJIT
New Jersey's Science & Technology University

Waste Removal Date _____

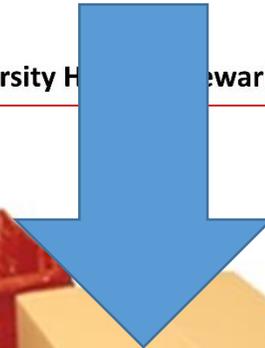
Outer Container Label

Building: _____
Room #: _____

University H... Newark, NJ 07102



Sharps containers and other items that are placed inside the RMW box are labeled with the inner container label



The Regulated Medical Waste (RMW) box itself is labeled with the Outer Container Label.



The NJIT Biological Waste Disposal Diagram may be found on the EHS website under Waste Management

Waste Type	Sharps/tubing	Reusable contaminated glass and plastic labware	Solid waste	Liquid waste
Waste Type and Examples				
Waste Type and Examples	Razor blades, scalpels, syringes, specimen tubes, contaminated broken glass, Pasteur pipettes, broken microscope slides	Contaminated flasks, cylinders, beakers, vials, bottles	Culture dishes, petri dishes, tissues, cells, gloves, masks, and other solid contaminated items	Human blood or body fluids, liquid growth media, animal blood, Recombinant DNA Waste
Container	Red Sharps Container			
Decontamination	Prior to placing in the Medical Waste box, full sharps containers contaminated with BL-2 material should be decontaminated by autoclaving or by chemical disinfection with 10% liquid chlorine bleach. Place in Regulated Medical Waste Box or Contact EHS for Disposal	Prior to drain disposal, liquid waste must be decontaminated with 10% liquid chlorine bleach solution, then carefully poured down the drain. Rinse with fresh water. Empty containers may then be handled as Solid Waste	Prior to placing in the Regulated Medical Waste box, Biosafety Level 2 waste must be decontaminated. Decontaminate with fresh 10% bleach soln. allow at least 20 minutes contact time OR Autoclave. Contact EHS for disposal	Prior to drain disposal, liquid waste must be decontaminated with 10% liquid chlorine bleach solution, then carefully poured down the drain. Rinse with fresh water. Empty containers may then be handled as Solid Waste OR Autoclave
Disposal		Drain Disposal. Reuse or dispose as solid waste		Drain Disposal
Labeling	Apply the Biological-Medical Waste label to the waste container when you begin to fill it. Please do not label empty containers. Fill the label out completely. Please complete all necessary information including laboratory contact information. The inner label is dated when EHS is contacted to remove the waste. Please apply the inner label to sharps containers and other containers that are placed in the RMW box. The outer label goes on the outside of the RMW box. <u>Example:</u>			
<p>Contact EHS for Disposal E-Mail completed Waste Pick Up Request to: healthandsafety@njit.edu If you have any questions, call 973-596-3059</p>				



Waste Container Request Form			
Principal Investigator:		Contact Information:	
Building:		Room:	

Type of Waste			
<input type="checkbox"/>	Chemical	<input type="checkbox"/>	Biological/Medical
<input type="checkbox"/>	Radiological	<input type="checkbox"/>	Acutely Hazardous ¹

Size and Type of Container	Quantity	Purpose and Category of Waste Container <i>*please be specific*</i>	State of Contents (Liquid / Solid)
Steel Closed Top		Solvents, pharma, non-hazardous liquids	
30 gallon drum			Liquids Only
Steel Open Top		Special request only	
30 gallon drum			Solids Only
Plastic Closed Top		Acids, bases, flammables, organics, inorganics	
30 gallon drum			Liquids Only
5 gallon pail			Liquids Only
Plastic Open Top		Special Request Only	
1 gallon pail			Solids Only
5 gallon pail			Solids/Liquids
15 gallon drum			Solids Only
30 gallon drum			Solids Only
Fiber Drum		Solid nonhazardous medical, contaminated PPE	
30 gallon drum			Solids Only
15 gallon drum			Solids Only
Biological Waste		Gloves, plastic tools, no sharps, bio-contaminated	
5 gallon pail with red bag			No Sharps
Medical box with red bag			
15 gallon fiber with red bag			No Sharps
30 gallon fiber with red bag			No Sharps
Sharps Containers		Sharps	Solids Only
Broken Glass		Contaminated and non-contaminated	
5 gallon pail			Solids Only
15 gallon drum			Solids Only

PLEASE NOTE: SEPARATE THE WASTE UNLESS THEY ARE SIMILAR

Ex: Do not store acids and flammables in the same container
Ex: All (empty) glass containers such as pipettes and bottles should go in the same container

Submit this form and all other questions to:
healthandsafety@njit.edu
Phone Number: (973) 596 3059

¹ <https://www5.njit.edu/environmentalsafety/sites/environmentalsafety/files/ACutely%20Hazardous%20Waste%20%28BP-Code%29.pdf>
NJIT EHS September 2015 Form EHS002



Waste Removal Request Form			
Principal Investigator:		Contact Information:	
Building:		Room:	

Type of Waste			
<input type="checkbox"/>	Chemical	<input type="checkbox"/>	Biological/Medical
<input type="checkbox"/>	Radiological	<input type="checkbox"/>	Acutely Hazardous ¹

#	Container Type:	Quantity/Size:	State of Contents:	Location of Waste:	Contents:	Hazard Type:
E X A M P L E	Steel Drum	2/ 30 gallon drum	Solid, Liquid	(Please be specific) By the door, Under the hood, etc.	(Please be specific) Methanol broken glass pharmaceutical waste	Flammable Corrosive Oxidizer, Toxic, Acid, Base, etc.
	Plastic Pail	1/ 5 gallon bucket				
	Fiber Drum	6/ 4 Liter Jug				
1						
2						
3						
4						

LABEL ALL WASTE CONTAINERS WITH CONTENTS BEFORE SUBMITTING THIS FORM
(Federal Law Prohibits the EHS Department from transporting waste containers that
are not properly labeled – please label all waste)

Submit this form and any other questions to:
healthandsafety@njit.edu
Phone Number: (973) 596 3059

¹ <https://www5.njit.edu/environmentalsafety/sites/environmentalsafety/files/ACutely%20Hazardous%20Waste%20%28BP-Code%29.pdf>
NJIT EHS September 2015 Form EHS001

- As with chemical waste, use the Waste Removal Request Form and Waste Container Request to facilitate the removal of biological waste from your lab and the delivery of replacement containers.
- These forms are found on the EHS website: <https://www5.njit.edu/environmentalsafety/ehs-forms/>

Questions?

Contact EHS with questions concerning biologicals waste management in your lab.

**NJIT Environmental Health and Safety (EHS)
Department**

Contact Us:

<https://www5.njit.edu/environmentalsafety/>

973-596-3059

healthandsafety@njit.edu