

TARLETON STATE UNIVERSITY

Biohazardous Waste Program

Biohazardous Waste

A. INTRODUCTION

The purpose of this document is to provide information, requirements, guidelines and procedures for the handling and disposal of hazardous and nonhazardous biological waste for all departments and units of Tarleton State University.

In Texas, disposal of biohazardous waste is regulated by the Texas Natural Resource Conservation

Commission (TNRCC). Depository landfill regulations also apply. "**BIOLOGICAL WASTE**" means discarded

biological material from teaching a research laboratories and operations. This does not include household or office

trash, waste from Food Services, Physical Plant, bedding and manure from normal agricultural operations or bedding

and litter from noninfectious animals. "**BIOHAZARDOUS WASTE**" means any solid or liquid biological waste that

is hazardous because of its physical and/or biological nature and is differentiated from that which contains

hazardous chemicals or radioactive materials. All waste that contains infectious material or which, because of its

biological nature, may be harmful to humans, animals, plants or the environment is biohazardous waste. This includes:

waste from infectious animals; bulk human blood or blood products; infectious microbiological waste

(including contaminated disposable culture dishes and disposable devices used to transfer inoculate and mix

cultures); pathological waste; sharps; and hazardous products of recombinant DNA biotechnology and

genetic manipulation. Definitions of other terms used in this document can be found in APPENDIX A.

Biohazardous waste generated at Tarleton State University is deposited at the Student Health Center and collected

monthly by a contracted biowaste transportation company or is treated by thermal or chemical disinfection or

by encapsulation (solidification) and then deposited at the University Transfer Station.

Biohazardous Waste may also be called "medical waste", "special waste", "red bag waste", "infectious waste", or "pathological waste." For simplicity, the present document will refer to all such material as "BIOHAZARDOUS WASTE". Definitions in this document are derived from Title 25, Texas Administrative Code, Chapter 1.

Sharps must be segregated from other waste and placed in puncture resistant containers. All metallic sharps, regardless of their use, are considered biohazardous and must be encapsulated prior to disposal. Liquid waste should be disinfected and discharged into the Sewer System. Treatment of all laboratory biological waste prior to disposal is good laboratory practice, and is highly recommended. Biohazardous waste must be treated and properly labeled and records must be maintained. Personnel with potential for contact with biohazardous material must be appropriately trained.

The key requirements for disposal of TSU's biohazardous waste are that it must be

1. segregated from other waste before treatment
2. treated to eliminate the biological hazard
3. specifically labeled to indicate the method of treatment
4. securely packaged
5. transported to, and placed in the dumpster by appropriately trained personnel
6. documented by maintenance of appropriate records

Biohazardous waste which is mixed with hazardous chemical waste, radioactive waste, or both must be treated to eliminate the biohazard prior to disposal. After treatment, the waste must be managed as hazardous chemical waste through the TSU Safety Office.

B. RESPONSIBILITY

The Principal Investigator, faculty member or other person with operational responsibility shall assure compliance with these requirements within his/her laboratory or area of responsibility.

C. SEGREGATION OF BIOLOGICAL WASTE IN THE LABORATORY

1. Any waste that could produce laceration or puncture injuries must be disposed of as "SHARPS". Sharps must be segregated from other waste. Metal sharps and broken glass may be commingled with each other, but not with non-sharp waste.
2. Waste that is to be incinerated should not be commingled with glass or plastics.

3. Biological waste must not be commingled with chemical waste or other laboratory trash.
4. Hazardous biological waste should be segregated from other biological waste.

D. CONTAINERS

Containers must: be appropriate for the contents; not leak; be properly labeled; and maintain their integrity if chemical or thermal treatment is use. Containers of biohazardous material should be kept closed.

1. METAL SHARPS - Place in a rigid, puncture resistant container (heavy walled plastic is recommended). The container should be used for encapsulation (see Section I.4) and disposal. Label the container "ENCAPSULATED SHARPS". Container and encapsulated contents must withstand an applied pressure of 40 psi without rupture. **Never attempt to retrieve items from a sharps container. Do not place sharps in plastic bags or other thin-walled containers.**
2. BROKEN GLASSWARE - Place in a rigid, puncture resistant container (plastic, heavy cardboard or metal), seal securely and clearly label "BROKEN GLASS".
3. SOLID BIOHAZARDOUS WASTE - Use heavy-duty plastic "BIOHAZARD BAGS" (autoclave bags) or containers for solid biohazardous waste (including contaminated disposable plastic labware, paper, bedding, etc [NOT SHARPS]).
4. NONHAZARDOUS BIOLOGICAL WASTE - Heavy duty plastic bags or other appropriate containers without a biohazard label are preferred. Red or orange biohazard bags or containers should not be used for nonhazardous material.
5. LIQUIDS should be placed in leak-proof containers able to withstand thermal or chemical treatment. **DO NOT USE PLASTIC BAGS TO CONTAIN LIQUIDS.**

E. STORAGE OF BIOLOGICAL WASTE

Biohazardous waste should be treated and disposed of promptly and not allowed to accumulate. Containers holding biohazardous material must be clearly labeled, including the Biohazard Symbol. Biological waste may be held temporarily under refrigeration, prior to disposal, in a safe manner that does not create aesthetic (visual or odor) problems. Storage enclosures must be clean and orderly with no access to unauthorized persons (warning signs must be posted).

F. TREATMENT OF BIOHAZARDOUS WASTE

Biohazardous waste must be rendered harmless by appropriate treatment prior to disposal. Waste should be treated as near the point of origination as possible. Treatment methods include: incineration; chemical disinfection; thermal disinfection; encapsulation.

G. HANDLING AND TRANSPORT

1. Properly trained laboratory personnel (not custodial) shall be responsible for transporting treated biological waste from the generation site to the dumpster or outside trash barrel. Untreated biohazardous waste shall be handled only by properly trained technical personnel.
2. Treated waste must be properly contained and labeled before transport to the TSU dumpster or trash barrel for disposal.
3. Transport of untreated biohazardous materials or foul or visually offensive material through nonlab or populated areas should be avoided.
4. Trash/laundry chutes, compactors, grinders cannot be used to transfer or process untreated biohazardous waste.

H. LABELING OF BIOHAZARDOUS WASTE

1. Each container of untreated biohazardous waste must be clearly identified as such and must be labeled with the Biohazard Symbol.
2. Each container of treated biohazardous waste intended for disposal at the Transfer Station must be labeled to indicate the method of treatment and to cover biohazard markings.
3. Label autoclave bags with commercial available autoclave tape that produces the word "AUTOCLAVED" upon adequate thermal treatment. Apply this tape across the Biohazard Symbol on the bag before autoclaving.
4. All containers of encapsulated sharps must be labeled as "ENCAPSULATED SHARPS".
5. Containers of nonhazardous biological waste should be labeled as "NONHAZARDOUS BIOLOGICAL WASTE".

I. DISPOSAL METHODS

1. Material that remains hazardous because it contains hazardous chemicals must be disposed of through the Safety Office. DO NOT send hazardous chemicals to the Transfer Station or discharge into the Sewer System.

2. ANIMAL CARCASSES AND BODY PARTS are not defined as medical waste unless the animals were intentionally infected with a human pathogen. Landfill disposition of uninfected animal parts is acceptable.

*Avoid conditions that may create visual or odor problems.

3. METAL SHARPS: Discarded sharps (contaminated or not) that may cause puncture or cuts, MUST be

contained, encapsulated and disposed of in a manner that prevents injury to laboratory, custodial and Landfill workers.

Needles, blades, etc., are considered BIOHAZARDOUS even if they are sterile, capped and in the original container.

Encapsulation provides the highest degree of safety possible at a reasonable cost and also eliminates the possibility

of uses of needles/syringes for illegal purposes. NOTE: NEVER PLACE SHARPS THAT ARE

NOT ENCAPSULATED IN A TRASH CONTAINER OR PLASTIC BAG THAT MIGHT BE HANDLED

BY CUSTODIAL STAFF.

a. Disposal Method: Encapsulate (solidify) in a properly labeled, puncture resistant container; place in a TSU

dumpster or trash barrel for deposition at the Transfer Station. (See "Encapsulation" APPENDIX A.)

b. For encapsulation, use disinfectant isolysers.

c. Needles, such as those used for gas chromatography, should be thoroughly rinsed to remove hazardous

chemicals, then disposed with non-contaminated broken glassware.

d. Do not attempt to recap, bend, break, or cut discarded needles.

4. PASTEUR PIPETS AND BROKEN GLASSWARE:

a. CONTAMINATED WITH BIOHAZARDOUS MATERIAL

1. Disinfect by thermal or chemical treatment; place in a properly labeled, leak proof and puncture resistant

container; place in a TSU dumpster or trash barrel for deposition at the Transfer Station; or,

2. Encapsulate in a properly labeled, rigid, puncture resistant container, and place in a TSU dumpster or trash

barrel for deposition at the Transfer Station.

Note: Encapsulation is required if glass is commingled with metal sharps.

b. NOT CONTAMINATED: Place in a puncture resistant container, then place in a TSU dumpster for

deposition at the Transfer Station. The container must be clearly labeled to indicate that it contains

BROKEN GLASS.

5. PLASTIC WASTE:

a. CONTAMINATED WITH BIOHAZARDOUS MATERIAL: Place in a properly labeled, leak proof

container, disinfect by thermal or chemical treatment; place in a TSU dumpster or trash

barrel for deposition at
the Transfer Station.

b. NOT CONTAMINATED: Place in a TSU dumpster or trash barrel for disposal at the Transfer Station.

6. MICROBIOLOGICAL WASTE:

a. Solid - Place in a properly labeled, leak proof container, disinfect by thermal or chemical treatment; place in a

TSU dumpster or trash barrel for disposal at the Transfer Station.

b. Liquid waste should be disinfected by thermal or chemical treatment then discharged into the Sewer System.

NOTE: Excess proteinaceous material can clump and cause drain clogging. Grinding of treated waste may be necessary. Do not grind untreated biohazardous material.

7. HUMAN PATHOLOGICAL WASTE:

a. Human cadavers, recognizable body parts: must be cremated or buried in accordance with 25 TAC

1.136(a)(4) December 21, 1994.

b. Other pathological waste from human and higher primates must be incinerated.

8. GENETIC MATERIAL: Disposal of materials containing recombinant DNA or genetically altered organisms must

be consistent with applicable NIH Guidelines, in addition to complying with the requirements contained in this document.

9. NONHAZARDOUS BIOLOGICAL WASTE:

a. Biological waste that is not infectious or otherwise hazardous to humans, animals, plants or the environment may

be discarded as regular municipal waste (solid) or sewage (liquid).

b. There are no record keeping or labeling requirements for nonhazardous biological waste.

c. It is good laboratory practice to autoclave or disinfect all microbial products. Culture materials and

biological specimens, including bacterial or "normal" cell cultures and primary tissues should be autoclaved or

treated with a 10% sodium hypochlorite (or equivalent) solution. Liquid waste should be discharged into the

Sewer System. Avoid conditions that may create visual or odor problems.

d. Nonhazardous waste should not be identified as hazardous. Containers should be labeled "

NONHAZARDOUS LABORATORY WASTE". Do not use Biohazard bags or "red bags" for nonhazardous waste.

e. Nonhazardous bedding (laboratory animal) and agricultural waste such as bedding, manure, etc. should be used

as compost or fertilizer whenever practical. Minimize deposition of recyclable material at the Transfer Station.

10. RADIOACTIVE WASTE: Biological waste that contains radioactive material must be disposed according to

the procedures of the TAMUS Office of Radiological Safety (TSU Safety Department).

11. CHEMICAL WASTE: Biohazardous waste which also contains hazardous chemicals must be treated to eliminate

the biohazard, then managed as hazardous chemical waste through the TSU Safety Office. Hazardous chemicals

must not be sent to the Transfer Station or discharged into the Sewer System.

J. TRAINING AND HAZARD COMMUNICATION

The principal Investigator or individual with primary supervisory responsibility must assure that all personnel who work

with, or who may contact potentially biohazardous material are informed of the hazards and are trained in the

proper procedures and equipment needed to avoid exposure, proper disposal of biohazardous wastes, and recognition

of symptoms of infection or exposure.

K. WRITTEN PROCEDURES AND RECORDS

Each biohazardous waste generating entity at TSU is required to maintain written records, which, at a minimum, contain

the following information:

1. Date of treatment
2. Quantity of waste treated
3. Method/conditions of treatment
4. Name (printed) and initials of the person(s) performing the treatment.

If an entity generates more than fifty (50) pounds of biohazardous waste per calendar month, the records must also include:

1. A written procedure for the operation and testing of any equipment used and a written procedure for the preparation of any chemicals used in treatment.
2. Processes for which the manufacturer documents compliance with specified performance standards (e.g., temperature, pressure, pH, etc.), and for processes which produce a continuous readout (e.g. strip chart or chart paper), routine parameter monitoring may be used to verify efficacy. Otherwise, biological monitoring is required

to document a 99.99% reduction using an appropriate biological indicator (Bacillus species) at the following intervals:

- a. 50-100 pounds per calendar month requires testing once per month
 - b. 101-200 pounds per calendar month requires testing biweekly
 - c. more than 200 pounds per calendar month requires testing weekly.
3. Records must be maintained for at least 3 years for EACH CONTAINER of biohazardous waste treated (including sharps that are encapsulated).

L. REFERENCES:

1. Title 25 Texas Administrative Code, Chapter 1, 1.131-1.137. December 21, 1994.
(Definition, Treatment
and Disposition of Special Waste from Health Care Related Facilities).
2. Title 30 Texas Administrative Code, Chapter 330, 330.24, 330.136, 330.641-643, 330.1001-1010. December 20, 1994. (Solid Waste Management Rules for Medical Waste Management, Disposal, Transportation, Collection, & Storage).
3. Centers for Disease Control/National Institutes of Health, Biosafety in Microbiological and Biomedical Laboratories, 3rd Edition, 1993.

APPENDIX A, DEFINITION OF TERMS

1. ANIMAL WASTE includes carcasses; body parts; whole blood and blood products, serum, plasma and other blood components; and bedding of animals.
2. BIOHAZARDOUS WASTE includes any waste that is infectious or, because of its physical and/or biological nature, may be harmful to humans, animals, plants or the environment. Biohazardous waste includes:
 - a. Animal waste known or suspected of being contaminated with a pathogen
 - b. Bulk human blood or blood products
 - c. Microbiological waste
 - d. Pathological waste
 - e. Infectious waste
 - f. Waste products of recombinant DNA biotechnology and genetic manipulation
 - g. Sharps
3. BIOLOGICAL INDICATOR - Commercial available microorganism (e.g. spore strips or vials of Bacillus species) which can be used to verify the performance of waste treatment equipment and/or processes.
4. BULK BLOOD AND BLOOD PRODUCTS - Discarded bulk (>100 ml.) blood and blood products (higher primate or human) in a free draining, liquid state; body fluids contaminated with visible blood; and materials saturated or dripping with blood.
5. CHEMICAL DISINFECTION means the use of a chemical agent such as 10% hypochlorite or EPA-approved chemical disinfectant/sterilant (used according to manufacturer's direction) to significantly reduce biological activity

of biohazardous material.

6. DEPOSITION IN A TRANSFER STATION/LANDFILL means in accordance with Title 30, Chapter 330 of the

Texas Administrative Code.

7. DISCHARGE INTO THE SEWER SYSTEM means the discharge or flushing of treated biological waste into the

local Sewer System followed by copious quantities of water.

8. ENCAPSULATION is the treatment of waste, especially sharps, using a material such as Plaster of Paris (or a

commercial product such as Isolyser) which when fully reacted, will encase the waste in a solid protective matrix.

The encapsulating agent must completely fill the container. The container and solidified contents must withstand an

applied pressure of 40 psi without disintegration.

9. INCINERATION means burning biological waste in an incinerator permitted by the Office of Air Quality, Texas

Natural Resource Conservation Commission.

10. INFECTIOUS WASTE is waste containing pathogens or biologically active material which because of its

type, concentration, and quantity is capable of transmitting disease.

11. MICROBIOLOGICAL WASTE:

a. discarded cultures and stocks of infectious agents and associated biological material

b. discarded cultures of specimens from medical, pathological, pharmaceutical, research, and clinical laboratories

c. discarded live and attenuated vaccines

d. discarded disposable culture dishes intentionally exposed to pathogens

e. discarded disposable devices use to transfer, inoculate, and mix cultures intentionally exposed to pathogens

12. PATHOGENS include any diseases that are transmissible to humans.

13. PATHOLOGICAL WASTE pertains to materials from human and higher primates and includes, but is not limited to:

a. human materials removed during surgery, labor, delivery, spontaneous abortion, autopsy or biopsy including: body

parts; tissues and fetuses; organs; bulk blood and body fluids

b. laboratory specimens of blood, tissue or body fluids after completion of laboratory examination

c. anatomical remains

14. SHARPS WASTE - Any device having acute rigid corners or edges, or projections capable of cutting or

piercing, including:

a. hypodermic needles, syringes, and blades

b. glass pipets, microscope slides, and broken glass items

15. THERMAL TREATMENT means:

a. autoclaving at a temperature of not less than 121oC., and a minimum pressure of 15 psi for at least 30 minutes

(longer times may be required depending on the amount of waste, water content and type

of container used)

b. subjecting biological material to dry heat of not less than 160°C. under atmospheric pressure for at least two

hours. (Exposure begins after the material reaches the specific temperature and does not include lag time.)

16. TREATMENT refers to chemical, thermal or mechanical processes that significantly reduce or eliminate the

hazardous characteristics, or that reduce the amount of a waste.