State University of New York at Stony Brook

Radiation Safety

Department of Environmental Health & Safety

Radioactive Waste Laboratory Management Guide

Stony Brook University

Radiation Safety (RS)

This document provides users of Radioactive Materials with instructions for preparing radioactive waste for pick-up and disposal. Not all radioactive waste generated at SUNY Stony Brook is described in this manual. If you have any questions regarding any procedure in this manual or need additional information, please contact us:

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General Requirements

1. SB Permit Holders must ensure, prior to the procurement of radioactive materials, that a method of disposal for the materials presently exists or can be worked out to the satisfaction of Radiation Safety.

2. Each SB Permit Holder must maintain accurate records of the types, quantities and forms of radioisotopes generated. Isotope inventory sheets and Radioactive Waste Disposal Records fulfill this requirement. Records kept by the SB Permit Holder must be based on either calculations or on measurements.

3. It is the responsibility of the SB Permit Holder to secure proper storage for radioactive waste generated in his / her laboratories.

4. Radioactive waste containers shall be stored only in locations that have been permitted by the Radiation Safety Officer. Waste containers shall NOT be stored in hallways, stairwells, or other uncontrolled areas.

5. All waste must be shielded so that the dose rate does not exceed **2mR/h**.

6. Radioactive waste containers shall always be kept closed when not in use. Liquid waste containers must always be kept in secondary containment. (e.g., placed in deep trays)

7. Regardless of content, each radioactive waste container shall be labeled with a "Caution Radioactive Materials" sticker.

8. When handling or transferring radioactive waste, the individual shall wear appropriate laboratory attire including lab coat, disposable gloves, protective eye wear and closed toed shoes and radiation detection badges if appropriate.

9. Radioactive wastes containing carcinogens, biohazards, or extremely hazardous chemicals must be handled separately and packaged in such a way that they present minimal hazards to people who handle the wastes. Contact Radiation Safety for specific requirements.

10. Sink disposal is NEVER allowed for radioactive material.

11. Do NOT place any radioactive waste in regular trash receptacles.

12. Package the waste properly according to the attached instructions.

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Decay in Storage

*Isotopes with a half-life < **90 DAYS** will be **decayed in storage***

Waste will be stored in space that has been properly authorized by Radiation Safety.

If proper storage space is limited contact Radiation Safety for waste pick up.

Fill out a Radioactive Waste Disposal Record for each container.

1. Separate waste by isotope and by waste type (solid, liquid, LSV, sharps, animal, lead)

2. Record the isotope, activity (uCi/ mCi), date, and chemical form for item that is to be decayed.

3. Record the date that the container is filled/ sealed.

4. Waste must be held for **10 half-lives** from the filled/ sealed date.

5. Using an appropriate survey meter, confirm that the waste has a surface reading of **< 0.05 mR/h** after 10 half-lives have passed. Document the reading and a survey instrument information.

6. Contact Radiation Safety for approval- Radioactive Waste Disposal Records must be approved by Radiation Safety **before** disposal.

7. After waste has decayed, **deface** any radioactive labels.

8. If waste has any additional hazards, please dispose of properly through EH&S Hazardous Waste Management

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Animal Waste

Definition:

Animal Waste includes radioactively contaminated animal carcasses, tissue samples, excreta, or blood. Animal waste does not include microscopic tissue sections or slides.

Segregation

Any radioactive animal waste should be stored in the DLAR freezer room. Contact the DLAR before conducting any experiments.

Separate and package waste appropriately (e.g., solids, carcasses, sharps, lead, etc.)

Packing and Disposal Instructions:

1. Fill out DLAR COLD ROOM FORM for **each** package that is placed in the cold room.
2. Package items sufficiently and label waste with lab name, isotope(s), date, and dose rate at surface.
3. Place labeled waste in "pending" bins on shelving in the freezer.
   - Radiation Safety must survey and approve waste before it is placed in barrel for disposal.

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Liquid Scintillation Vials

Definition:

Scintillation waste consists of liquid scintillation cocktails (including dissolved or suspended samples) and associated containers such as counting vials.

Campus policy treats all scintillation media as both hazardous and radioactive waste.

Segregation:

All LSV waste used for scintillation counting are collected in the designated waste drums supplied by Radiation Safety.

Packing Instructions

All liquid scintillation vials should be put into LSV drum/ bucket provided by Radiation Safety. Keep a record of all waste placed in the container by completing a Radioactive Waste Disposal Record.

Disposal:

Contact Radiation Safety to schedule a waste pick up.

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Lead Pigs

Definition:

Lead Pigs are source vial enclosures that have lead integrated into them for use as shielding.

NOTE: *Uncontaminated Plastic Pigs that do not contain lead can be recycled. All radioactive signs and labels must be defaced or removed prior to disposal. Contact Radiation for pick up.*

Segregation:

Lead Pigs must be segregated between contaminated and uncontaminated pigs.

Packaging Instructions:

Uncontaminated Lead Pigs

- Deface all labels on pig.
- Place all uncontaminated lead pigs in a suitable container for transport.
- Lead will be recycled. No paperwork or labeling is required.
- Notify Radiation Safety to schedule a waste pick-up.

Contaminated Lead Pigs

- Place all contaminated lead pigs in plastic bag.
- Attach to exterior of the outer bag.
    - Caution Radioactive Materials sticker or tape.
    - Label bag with isotope and date.
- Contact Radiation Safety to schedule a waste pick-up.

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Radioactive Sharps

Definition:

Sharps include hypodermic needles, syringes, scalpels, broken glass, and razor blades.

Packaging Instructions:

All sharps must be placed in a puncture resistant sharps container (available from radiation

Protection Services)

- Attach a "Caution Radioactive Materials" sticker or label to the exterior of the sharps Container.
- Attach the Radioactive Waste Disposal Record to the exterior of each container.
    - Waste disposal records must be updated each time waste is added to the container.
    - Fill/Sealed date will be recorded when waste is longer being added to the container.
- Use separate containers for isotopes with half-lives < 90 days.

Disposal:

Contact Radiation Safety to schedule a waste a pick-up.

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Liquid Radioactive Waste

The only suitable containers for liquid radioactive waste are carboys supplied by Radiation Safety. Always keep liquid waste stored in secondary containment.

Definition:

Liquid waste may consist of a variety of chemical constituents, provided that the waste is homogeneous, and is "pourable".

Although small amounts of non-soluble materials may be unavoidably present, liquid waste should generally not contain solid materials, especially plastic laboratory equipment such as pipette tips, microcentrifuge tubes, etc.

Segregation: Liquid waste must be segregated based on

1. Isotope Half-life (Decay in Storage vs. Long lived)

   Short-lived (Decay in storage): isotopes with a half-life less < 90 days

   Long-lived: isotopes with a half-life > 90 days

2. Chemical composition (Aqueous vs. Mixed)

"Aqueous" Radioactive Liquid: Liquid waste in which the radioactive waste materials are either dissolved in water or evenly distributed in a liquid which is mainly composed of water.

"Mixed" Radioactive Liquid: Radioactive liquid waste which is contaminated with a toxic, flammable, poisonous or reactive material. When generation of mixed waste is unavoidable it must be segregated from nonhazardous aqueous solutions. Contact Radiation Protection Services for assistance in managing mixed waste.

Packaging Instructions:

For Aqueous Liquids Only

- Liquid waste should always be stored in carboys provided by Radiation Safety.
- Use separate containers for short-lived waste and long-lived waste.
- Carboys should always be stored in secondary containment that has absorbent pad placed in the bottom.
- Do not fill carboy greater than 75% capacity.
- Affix a" Caution Radioactive Materials" sticker on the outside of the container.
- Each container should have their own waste disposal record.

- Waste disposal records should be updated each time waste is added to the container. When waste is no longer being added to that container the filled/ sealed date will be recorded.

For Mixed Liquids Only

- Dispose of all "Mixed" radioactive liquid into a chemically compatible non-breakable container.
- Use separate containers for short-lived waste and long-lived waste.
- Containers should always be stored in secondary containment.
- Do not fill containers greater than 75% capacity.
- ” Caution Radioactive Materials” sticker on the outside.
- Label container with the isotope and chemical contents
  - Use full names- no abbreviations or chemical formulas.
- Each container should have their own waste disposal record.
  - Waste disposal records should be updated each time waste is added to the container. When waste is no longer being added to that container the filed/ sealed date will be recorded.

Disposal:

For short-lived isotopes

Short-lived isotopes will be held in the laboratory for ten half-lives from the filled/sealed date. After ten half-lives, use an appropriate survey meter to confirm waste has decayed to 0.05 mR/h. Waste Disposal Record must be approved by Radiation Safety prior to disposal.

Mixed waste will need to be disposed through EH&S Hazardous Waste Management

For long-lived isotopes

Long lived isotopes will be collected by Radiation Safety for disposal. Ensure all records and information on the containers are correct and up to date prior to contacting Radiation Safety.

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Solid Radioactive Waste

Definition:

Solid waste consists of dry, radioactively contaminated materials (paper, plastic, microcentrifuge tubes, glassware, empty vials, gloves, etc.)

Small amounts of damp materials may be present, but solid waste may not contain any pourable liquids.

Solid waste must not contain any metals, lead pigs, sealed sources, or sharps.

Segregation: Solid waste must be segregated based on isotope half-life (Decay in Storage vs. Long lived)

Short-lived (Decay in storage): isotopes with a half-life less < 90 days

Long-lived: isotopes with a half-life > 90 days

Packing

- Affix a" Caution Radioactive Materials" sticker on the outside of the container.
- Solid waste should be stored in a waste container lined with a plastic bag.
- Each container should have their own waste disposal record.
    - Waste disposal records should be updated each time waste is added to the container. When waste is no longer being added to that container the filed/ sealed date will be recorded.

Disposal

For short lived isotopes

Short-lived isotopes will be held in the laboratory for ten half-lives from the filled/sealed date. After ten half-lives, use an appropriate survey meter to confirm waste has decayed to 0.05 mR/h. Waste Disposal Record must be approved by Radiation Safety prior to disposal.

For long-lived isotopes

Long lived isotopes will be collected by Radiation Safety for disposal. Ensure all records and information on the containers are correct and up to date prior to contacting Radiation Safety.