

Radioactive Waste

Examples of Radioactive Waste

Radioactive waste is any waste that contains or is contaminated with radioactive material.

Waste Minimization and Pollution Prevention Guidance.

- Aqueous radioactive solutions
- Liquid scintillation counting fluids and vials (if LSC fluids and vials are flammable, it's "mixed waste")
- Materials contaminated with radioactive material after inactivation of infectious agents, such as:
 - Animal carcasses and excreta
 - Experimental or spill clean-up materials, absorbent paper, gloves
 - Patient care materials
 - Plastic or glassware

General Information and Assistance

- In the planning stages of your experiment, review disposal procedures with your Area Health Physicist, (301) 496-5774. Radioactive waste containers (stepcan, 2 gallon and 5 gallon carboys) are available by calling Radioactive Waste Service at (301) 496-4451. Radioactive Waste Pickup Receipts (NSN-7530-00-L07-8835) and Caution-Radioactive Material labels (NSN-7690-00-833-0318) are available at the self-service store. Call (301) 496-4451 or log on to: <http://drsportal.ors.od.nih.gov/> to request your radioactive waste pickup.



Security

- Radioactive waste must be secured or held under constant surveillance to prevent unauthorized removal or access
- Source vials, when not in use, must be stored in a locked container at all times
- Consult your Area Health Physicist, (301) 496-5774, for more information

Incompatible Mixture

Don't Mix

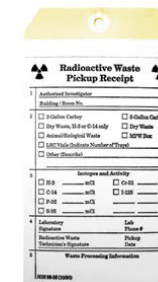
- Liquid waste with dry waste
- Short half-life (< 120 days) with long (> 120 days) half-life waste
- Waste containing chloroform or trichloroacetic acid (TCA) with any other aqueous radioactive waste
- Aqueous solutions with mixed wastes
- For mixed wastes, see segregation policy in [Multihazardous Waste section](#)

Adjust pH

- Aqueous liquid waste solutions should be adjusted to a pH between 6 and 10. Use caution; call your Area Health Physicist, (301) 496-5774, for assistance

Identify and Label

- List on the Radioactive Waste Pickup Receipt an estimate of radionuclide(s) and activity present at time of pick-up
- Ensure that all radioactive waste containers have a:
 - Caution-Radioactive Material label (NSN-7690-00-833-0318)
 - Radioactive Waste Pickup Receipt (NSN-7530-00-L07-8835)



Shielding Requirements

- Shield radioactive material such that:
 - Radiation levels are less than 2 millirem/hour @ 10 cm within a posted laboratory, AND radiation levels are less than 0.5 millirem/hour or will total 50 millirems in a year in an unrestricted area (e.g., space adjacent to a posted laboratory or corridor)
- The Radioactive Waste Services recycles beta/plastic and lead shielding – call (301) 496-4451 and inquire if shielding is available

Waste Storage

- Radioactive waste must only be stored in laboratories posted for the use of radioactive material
- NEVER place radioactive waste in corridors-even while awaiting pickup
- Ensure that all waste containers are closed securely

Waste Management Procedures for Material Contaminated With Radioactive Material

- **Do not discard radioactive wastes into sink drains**
- Use plastic carboys available from Radioactive Waste Service, (301) 496-4451
- Contents should NOT exceed the "Fill Line" on the container
- Secure the cap of the container tightly
- Attach a Radioactive Waste Pickup Receipt (NSN-7530-00-L07-8835)



Aqueous Waste

Solvents/Other Hazardous Chemical Constituents

- Refer to Multihazardous Waste Section
- Use special mixed waste containers available from the Radioactive Waste Service, (301) 496-4451
- Attach a Radioactive Waste Pickup Receipt (NSN-7530-00-L07-8835) and a Chemical Waste Tag (NSN-7530-00-L07-5985)
- As chemicals are added to the container, record chemical name, amount, and concentration on the Chemical Waste Tag

Disposable Labware

- Use Disposable Labware & Broken Glass box (NSN-811500N192305)
- Use absorbent paper pads for residual liquid in the bottom of the box
- Close and secure box with filament tape
- Affix Caution-Radioactive Material label (NSN-7690-00-833-0318)
- Attach a Radioactive Waste Pickup Receipt (NSN-7530-00-L07-8835)

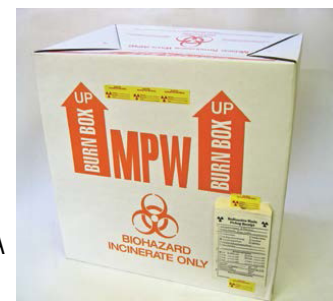
"Sharps" (needles, syringes, scalpel blades/razor blades, micro-fine pipette tips, etc.

- Place "sharps" in a puncture resistant container: (small: NSN-6530-01-294-2865; syringes, scalpel or medium: NSN-6530-01-274-5099)
- Fill only 3/4 full, snap lid closed, then place sharps box inside MPW box
- Affix Caution-Radioactive Material label (NSN-7690-00-833-0318)
- Attach a Radioactive Waste Pickup Receipt (NSN-7530-00-L07-8835)



MPW, Patient Care Materials, Animal Carcasses or Tissues, Bedding or Solid Excreta With Radionuclides

- Use MPW box (NSN-8115-00-L04-0680), add absorbent material if necessary
- Fold the flaps down on the outside of the box. Only use the two black plastic bags that come with MPW box
- Place TWO plastic bags (one inside the other) into the MPW box and pull the bag tops down over the flaps
- A filled MPW box should weigh NO MORE than 40 pounds or be no more than 3/4 full (DO NOT OVERFILL)
- Seal each bag SEPARATELY. Twist plastic bag at the top, bend the twisted portion to form a loop, and seal using the plastic bag closure tie
- Close the box. Fold Flap A down into the box, fold the B Flaps over Flap A, push Flap C down to lock with Flap A
- PRINT your building, room number, type of waste (sharps, patient care, animal tissue, etc.) on the box top label area
- Clearly affix Caution- Radioactive Material label (NSN-7690-00-833-0318) and Radioactive Waste Pickup Receipt (NSN-7530-00-L07-8835)



NOTE: For animal tissue or carcasses, refrigerate or freeze if held longer than 4 hours; freeze if held more than 24 hours

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Radioactive Waste

Infectious Waste to be Autoclaved

- Contact your Area Health Physicist for guidance on autoclaving radioactive material prior to using an autoclave to process the material
- A Caution, Radioactive material label, must be affixed to any autoclave in which radioactive material will be processed
- Use TWO (one inside the other) autoclavable Biohazard bags imprinted with process indicator (small: NSN-6530-01-282-6378; medium: NSN-6530-01-142-2255; large: NSN-6530-01-218-4644)
- Place bags in pan for transporting and autoclaving
- Add 50 ml water to the inner autoclave bag BEFORE closing and seal each bag SEPARATELY with autoclave tape
- Process for 60 minutes at minimum 121° Centigrade
- Cool and affix Caution-Radioactive Material label (NSN-7690-00-833-0318) and Radioactive Waste Pick-up Receipt (NSN-7530-00-L07-8835)
- Specific procedures for autoclaving radioactive waste must be approved by your Area Health Physicist prior to use of an autoclave to inactivate the waste
- Survey the inside of the autoclave for radioactive contamination following use of the autoclave
- Chemical indicator should be included in every run to ensure adequate sterilization

NOTE: Autoclaves must be maintained to the manufacturer's specifications and validated monthly

Lead

- Lead which contains or is contaminated with radioactive material is a mixed waste—see the [Multihazardous Waste Section](#)

Liquid Scintillation Vials

- Vials with hazardous chemical(s) are a mixed waste—see the [Multihazardous Waste Section](#)
- Segregate securely capped vials according to radionuclide—H-3 or C-14 may be disposed of together
- Segregate securely capped vials according to cocktail type
- Place vials in original shipping tray or box—trays with the same radionuclide may be grouped together
- Clearly affix Caution-Radioactive Material label (NSN-7690-00-833-0318)
- Attach a Radioactive Waste Pickup Receipt (NSN-7530-00-L07-8835). Add the name of Scintillation Cocktail to Pickup Receipt



Source Vials

- Empty vials may be disposed of in stepcan as dry solid radioactive waste
- For vials containing radioactive fluid or vials with lead packaging:
 - Place securely capped vials in a small box (with plastic bag liner)
 - Affix a Caution-Radioactive Material label (NSN-7690-00-833-0318) to the box
 - Attach a Radioactive Waste Pickup Receipt (NSN-7530-00-L07-8835)



Other Types of Dry/Solid Material

- Use labeled stepcan containers (with liner bags) available from Radioactive Waste Service, (301) 496-4451
- Clearly affix Caution-Radioactive Material label (NSN-7690-00-833-0318)
- Attach a Radioactive Waste Pickup Receipt (NSN-7530-00-L07-8835)

Contaminated Equipment

- Call the Radioactive Waste Service, (301) 496-4451, for guidance on disposing contaminated equipment

Survey Instruments

- Contact your Area Health Physicist to see if your survey instrument can be recycled
- Remove the radioactive source from the side of the instrument and call Radioactive Waste Service at (301) 496-4451 to pick-up the check source. Dispose of the survey meter and accessories through the NIH property management system
- Attach a Radioactive Waste Pick-up Receipt (NSN-7530-00-L07-8835) to the check source
- Contact your Area Health Physicist or visit the DRS website at: http://drs.ors.od.nih.gov/policies/Pages/equip_clearance.aspx [#xrayclear](#) for guidance on how to surplus Liquid Scintillation or Gamma counters and other laboratory equipment containing internal radioactive sources

Uranium and Thorium Compounds

- Call the Radioactive Waste Services, (301) 496-4451, for guidance on disposing all forms of Uranium and Thorium waste