## Multihazardous Waste

### Examples of Multihazardous Waste

Multihazardous waste contains two or more of the following: radioactive material, infectious agent(s), or hazardous chemical(s). One type of multihazardous waste is Mixed Waste - Waste that contains both a hazardous component and radioactive material regulated by the NRC. "Mixed Waste" is a subset of multihazardous waste.

- Aqueous radioactive wastes containing chloroform or heavy metals
- Methanol/acetic acid solutions from electrophoresis procedures containing radioactive material
- Hazardous liquid scintillation counting fluids with radioactive content
- Radioactive trichloroacetic acid solutions
- Phenol/chloroform mixtures used to extract DNA from radiolabeled cells
- Vacuum pump oil contaminated with radioactive material
- Chemical or radioactive wastes containing infectious agents
- Used animal bedding contaminated with at least two of the above listed hazard types (chemical, radioactive, and infectious)
- Lead contaminated with radioactive material
- Aqueous radioactive liquids with pH =<2 or >12.5

### General Information

Mixed waste containers (4L, 10L, and 20L) and spill trays are available by calling Radioactive Waste Service at (301) 496-4451.

Caution-Radioactive Material labels (NSN-7690-00-833-0318), Radioactive Waste Pickup Receipts (NSN-7530-00-L07-8835), and Chemical Waste Tags (NSN-7530-00-L07-5985) are available at the self-service store. Call (301) 496-4451 or log on to [http://drsportal.ors.od.nih.gov/](http://drsportal.ors.od.nih.gov/) to request your mixed waste pickup.

### Avoid Generating

- Avoid generating multihazardous wastes as disposal can be difficult and expensive. For help in avoiding the generation of multihazardous waste, call the Division of Environmental Protection (DEP), (301) 496-7990 or the Division of Radiation Safety (DRS), (301) 496-5774

### Minimize Generation

- Minimize volumes generated if the generation of multihazardous waste cannot be avoided
- PRIOR to beginning work activities that will generate multihazardous waste, call DEP or DRS for waste management information
- Inactivation of the agent(s) is usually the first step in the disposal process if the multihazardous waste contains an infectious agent(s).
- Contact your Health and Safety Specialist in the Department of Health and Safety (DOHS) at (301) 496-2346, for appropriate inactivation methods
- Specific procedures for autoclaving radioactive waste must be approved by your Area Health Physicist prior to use of an autoclave to inactivate the waste (see [Radioactive Waste Section](#))

### Security

- Mixed waste must be secured or held under constant surveillance to prevent unauthorized removal or access. Consult your Area Health Physicist in DRS at (301) 496-5774, for more information

### Incompatible Mixture

**Do Not Mix**

- Liquid mixed waste with solid radioactive waste
- Hazardous chemicals with radioactive aqueous wastes
- Segregate by isotope half-life: very short (<30 days), intermediate (30-120 days), and long (>120 days)
- Flammable liquids with radioactive material
- Radioactive aqueous wastes with high organic content mixed waste
- Infectious agents with non-infectious materials

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**Multihazardous Waste**

Pick-up: 301-496-4451

Assistance: 301-496-5774
Multihazardous Waste

**Identify and Label**
- List on the Radioactive Waste Pickup Receipt an estimate of radionuclide(s) and activity present at time of pick-up
- Record on the Chemical Waste Tag each chemical added to the container with the concentration and volume
- Ensure that all mixed waste containers have a:
  - Caution-Radioactive Material label (NSN-7690-00-833-0318)
  - Radioactive Waste Pickup Receipt (NSN-7530-00-L07-8835)
  - Chemical Waste Tag (NIH 2459, (NSN-7530-00-L07-5985) or equivalent chemical waste contractor supplied tag)

**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 50 millirems in a year in an unrestricted area (e.g., space adjacent to a posted laboratory or corridor)
- The Radioactive Waste Service recycles beta/plastic and lead shielding - call (301) 496-4451 and inquire if shielding is available

**Waste Storage**
- Mixed waste containing radioactive material must only be stored in laboratories posted for the use of radioactive material
- NEVER place mixed waste in corridors - even while awaiting pickup
- Ensure that all waste containers are closed securely to prevent leaks, spills, or escape of vapors
- Mixed waste must be stored in appropriate spill containment trays or devices
- Mixed waste must be picked up within 60 days of the collection start date
Waste Management and Disposal Procedures for Multihazardous Waste

- Waste containing a mixture of Hazardous Chemical(s) and Radioactive Material:
  - Place Waste in the smallest container provided by Division of Radiation Safety (DRS).
  - Complete and attach a Chemical Waste Tag, Radioactive Waste Pick-up Receipt and a Caution Radioactive Material label to the container.
  - Call 301-496-4451 for waste pick-up.

- Waste containing a mixture of Hazardous Chemical(s), Radioactive Material and Infectious Agent(s):
  - Can Infectious Agent(s) be inactivated?
    - NO: Call Division of Environmental Protection (DEP) at 301-496-7990 for appropriate disposal method.
    - YES: Inactivate Agent(s) and treat the waste as Mixed Waste. Place waste in smallest container provided by DRS.

- Waste containing Radioactive Material and Infectious Agent(s):
  - Can Infectious Agent(s) be inactivated?
    - NO: Inactivate Agent(s) and treat the waste as Chemical Waste. Complete and attach a Chemical Waste Tag to container.
    - YES: Complete and attach a Chemical Waste Tag to container.

- Waste containing Hazardous Chemical(s), and Infectious Agent(s):
  - Can Infectious Agent(s) be inactivated?
    - NO: Inactivate Agent(s) and treat the waste as Mixed Waste. Place waste in smallest container provided by DRS.
    - YES: Inactivate Agent(s) and treat the waste as Chemical Waste. Complete and attach a Chemical Waste Tag to container.

Specific Types of Mixed Waste:
- Liquid Scintillation Vials With Flammable Material:
  - Ensure vials caps are securely tightened.
  - Place vials in original tray or box (with plastic liner).
  - Separate by radionuclide - Vials with the same nuclide may be grouped together and H-3 & C-14 may be grouped together.
  - Attach to tray or box:
    - Caution-Radioactive Material label (NSN-7690-00-833-0318).
    - Radioactive Waste Pickup Receipt (NSN-7530-00-L07-8835). Add the name of Scintillation Cocktail to Pickup Receipt.

- Lead Contaminated With Radioactive Material:
  - Place lead in box and attach:
    - Caution-Radioactive Material label (NSN-7690-00-833-0318).
    - Radioactive Waste Pickup Receipt (NSN-7530-00-L07-8835).
    - Chemical Waste Tag (NSN-7530-00-L07-5985).

Multihazardous Waste Pick-up: 301-496-4451 Assistance: 301-496-5774