

Proper Segregation and Disposal of Low-Level Radioactive Waste (LLRW) at Wayne State University

Wayne State University-Office of Environmental Health & Safety (OEH&S) will collect and process the various forms of radioactive waste generated at University research facilities provided the waste is properly segregated, packaged and identified according to the methods detailed in these guidelines.

Disposal of the various forms of low-level radioactive waste (LLRW) is complex, extremely difficult, and very costly. Waste minimization and segregation are critical to reducing costs and ensuring regulatory compliance. All radioactive waste generators must adhere to the waste minimization and waste segregation guidelines.

A. Guidelines for LLRW

- C It is illegal to dump LLRW into the municipal sewer system-the drain.
- C Only OEH&S can dispose of LLRW generated at Wayne State University.
- C Use waste minimization techniques at all times.
- C Maintain a record of each radionuclide, activity, any chemical constituents, and the date each radionuclide is placed into an OEH&S approved waste container.

B. Labeling and Packaging Procedures

Radioactive Dry Solid Waste

Dry solid waste consists of paper, plastic containers, and other forms of contaminated laboratory waste.

Container Type

- C Dry solid waste is collected in 30-gallon drums or 2-cubic foot boxes provided by OEH&S .
- C Ensure yellow fiber waste drum or cardboard box is lined with two large plastic bags prior to discarding dry solid waste into a fiber drum or cardboard box.

Container Labeling

Dry solid waste containers will be properly labeled with:

- C Completed Radioactive Waste Container Form (Form HP-6). Affix form to the top of the lid immediately upon requesting a waste pick-up.

Dry solid waste containers should not contain the following:

- C Free Standing Liquids
- C Biohazardous Materials or Biohazard Bags
- C Sharps
- C Sealed Sources
- C Lead
- C RCRA/TSCA Hazardous Waste

Do **not** commingle solid waste streams (liquid, liquid scintillation vials, animal/biological).

Dry Solid Waste Segregation

- C *Use different containers for each isotope, with the exception of 3H and 14C which can be mixed together in a single container.*

Radioactive Liquid Waste

Liquid waste consists of freestanding liquids only, such as isotopes dissolved or suspended in water (i.e., solutions of proteins, buffers, cell media).

Container Type

- C Liquid waste will be collected in one gallon polyethylene jugs provided by OEH&S.

Container Labeling

Liquid waste containers should be properly labeled with:

- C Completed Radioactive Material Cards (yellow cards).

Liquid waste acceptance criteria:

- C Liquid waste containers should **not** be over filled.
- C Do **not** commingle liquid waste with other waste streams (solid, liquid scintillation vials, animal/biological).
- C Liquid waste containers **must** be stored in secondary containment.
- C Liquid waste pH should be between six and nine.

- C If your waste contains any hazardous materials (e.g., flammables, corrosives, reactives, and poisons), even if it is mixed with water, you **must** notify OEH&S and complete a Chemical Waste Content Tag.

Liquid Waste Segregation

- C *Use separate jugs for each isotope, with the exception of 3H and 14C which can be mixed together in a single jug.*

Radioactive Liquid Scintillation Vial Waste

Liquid scintillation vials are collected in flats (trays) which can be provided by OEH&S.

Container Labeling

Liquid scintillation vial waste flats (trays) will be properly labeled with:

- C Completed Radioactive Waste Container Form (Form HP-6).

Liquid scintillation vial waste acceptance criteria:

- C Do **not** commingle liquid scintillation vial waste with other waste streams (solids, liquids, and animal/biological).
- C Do **not** place small vials of stock solutions with scintillation vials.
- C Vials containing residual fluids **must** be capped.
- C Use approved Biodegradable Scintillation Fluid unless otherwise authorized.
- C Radioactive Waste Container Log should be marked with the name brand of the liquid scintillation cocktail.

Liquid Scintillation Vial Waste Segregation

Do not mix scintillation vials containing other nuclides in the same flat (tray) with 3H and/or 14C.

The terms of the University Radioactive Materials License require detailed records of receipt, use and disposal of radioactive materials. **All** radioactive materials must be accounted for.

It is important that the radioactive waste being picked up is subtracted from the total possession limits allowable to the authorized user. Authorized users exceeding their maximum possession limits **will not** be permitted to order more radionuclides.

C. Disposal Cards and Container Logs

Radioactive Material Disposal Cards (Yellow Cards)

A Radioactive Material Disposal Card must accompany each liquid container of radioactive waste. Disposal Cards **must** be completed as soon as waste is placed into the container. Do not wait until the waste container is full to complete the disposal card. Please fill in all sections on the Radioactive Material Disposal Card.

Things to remember while completing Yellow Disposal Cards:

- C Enter the activities in microcuries.
- C Sign the card.
- C Keep the card clean and avoid contamination.

Unless the Disposal Cards are properly completed, OEH&S personnel will not pick-up the radioactive waste.

Radioactive Waste Container Log (Form HP-6)

A Radioactive Waste Container Log must accompany each dry solid drum or box and scintillation vial flat. Log sheets **must** be completed as soon as waste is placed into the different types of containers. Do not wait until the waste containers are full to complete the log sheet. Please fill in all sections on the Radioactive Waste Container Log Sheet.

Things to remember while completing Container Log Sheets:

- C Enter dates when isotope is placed into a container.
- C Enter the activities in microcuries.
- C Mark Container Log Sheet with the name brand of the liquid scintillation fluid.
- C Total the amount of the activity for the container before a pick-up.

Unless the Container Log Sheets are properly completed, OEH&S personnel will not pick-up the radioactive waste.

Chemical Waste Content Tag

A Chemical Waste Content Tag must accompany each liquid container that also contains a hazardous chemical (i.e., flammables, corrosives, reactives, and poisons). Remember that the objective is to identify mixed waste; waste that is both hazardous and radioactive. This is especially important for liquid waste. Chemical Waste Tags **must** be completed as

soon as mixed waste is placed into the container. Do not wait until the waste container is full to complete the Waste Content Tag. Please fill in all sections on the Chemical Waste Content Tag.

Things to remember while completing Chemical Waste Content Tags:

- C Enter dates as soon as mixed waste is placed into a container.
- C Write the complete name of each chemical on the tag and its percentage
- C Keep the tag clean and avoid contamination.
- C Sign the tag.

Unless the Chemical Waste Content Tags are properly completed, OEH&S personnel will not pick up the mixed waste.

D. Request for Radioactive Waste Removal

Removal of Radioactive Waste takes five to ten working days from the date of request.

Please plan accordingly.

Using the Website to Request Waste Removal

1. Go to **www.oehs.wayne.edu**
2. Click on Radioactive Waste.
3. Click on Radioactive Waste Disposal Form.
4. Complete all sections.