

RADIOACTIVE WASTE DISPOSAL GUIDELINES

Last Revised: 4/13/17

A. Summary

Radioactive waste is solid or liquid material that has been contaminated by radionuclides. Radioactive waste has the potential to cause dangerous or deadly harm if improperly handled. Injuries and illnesses can be avoided by handling materials correctly, and by following the appropriate disposal methods.

B. Scintillation Vials

- Separate scintillation vials with activities less than 0.05 $\mu\text{Ci/ml}$ of ^3H or ^{14}C from other scintillation vials.
- If you buy vials in bulk and need empty flats or boxes, submit a [Radioactive Waste Request form](#), and use the comments section. If you are located at the UC Davis Health (UCDH) campus, call Health Physics at (916) 734-3355.
- Pack the vials in the original shipping boxes, or in boxes supplied by EH&S. Seal the boxes with tape. Clearly identify the radionuclides and activities contained in each box on the Radioactive Waste Label.
- Non-radioactive, environmentally safe scintillation cocktails may **not** be disposed of down sink drains.
- To request a waste pick-up, use the [Radioactive Waste Request form](#). If you are located at UCDH, call Health Physics at (916) 734-3355 to request a waste pick-up.

C. Radioactive Waste Containing Biological Material

- Double bag biological waste in 4 mil, clear plastic bags (Central Storehouse SN# 89121-146) for disposal. Seal the bags and attach a completed Radioactive Waste label. Clearly identify the radionuclide and activity contained in each bag.
- Contact EH&S prior to generating biohazardous radioactive waste.
- Freeze carcasses, tissue sample, etc. until pick-up.

- If you anticipate generating large volumes of biological waste, please call the Environmental Services Facility (530-754-5058), or UCDH Health Physics (916-734-3355) **before** beginning the experiment. It may be possible to arrange same day pick-up for large items.

D. Radioactive Solid Waste

- Separate all radionuclides when possible. Questions on waste segregation can be answered by calling EH&S (530-754-5058).
- Dispose of solid waste in an EH&S 2 cubic foot dry waste box with 4 mil clear plastic liners. Seal box bottom with tape before adding liner or any waste. Clearly identify the radionuclides and activities contained in each box on the waste tag. Clear plastic bags and RAD waste tags are available from the Environmental Services Facility (ESF) or UCDH Health Physics.
- Syringe needles, razor blades, and broken glass must be put in sealed, hard-walled containers before placing them in a dry waste box. Use the white sharps containers and place a radiation label on the container. **Do not use red containers unless you are located at the UCDMC.**
- Do **not** throw hazardous materials, including chemicals, ether cans, biological materials, broken thermometers, or liquids of any kind into solid waste containers. Call the ESF (530-754-5058) or UCDH Health Physics (916-734-3355) if you have any questions about what can and cannot be disposed of as solid waste.
- Do **not** put lead or metal into dry radioactive waste containers. Check for contamination and decontaminate if necessary. Lead is recycled, and there is no charge for this service. Use the comments section of your waste request for pick-up.
- Seal the liner and box top with tape. Complete the EH&S Radioactive Waste Label before submitting a pickup request. To request a waste pick-up, use the [Radioactive Waste Request form](#). If you are located at UCDH, call Health Physics (530-734-3355) to request a waste pick-up.

E. Radioactive Liquid Waste

- Aqueous liquids counted with a gamma well or liquid scintillation counter showing less than $\text{CPM}_{\text{BKG}} + 3\sqrt{\text{CPM}_{\text{BKG}}}$ are considered nonradioactive. Aqueous liquids, such as water, detergents, and mild buffers meeting this criterion can be disposed of down the drain.
- Separate aqueous liquids with a half-life of less than 120 days from aqueous liquids with other radioisotopes.

- Clearly identify the radionuclides, activities, and constituents by percent contained in each jug on the waste label. Remember that “aqueous” refers to water, and that the total of all percentages must add up to 100. The waste **cannot** be removed from the laboratory without this information.
- Dispose of radioactive liquid waste in an EH&S 5 gallon black jug. The lids on radioactive liquid waste containers must always be securely fastened, except when adding liquid radioactive waste. Do not fill the containers higher than the fill line that is indicated on the jug. Always use plastic secondary containers to prevent spills when filling radioactive liquid waste containers. Do **not** place pipette tips, magnetic stirrers, or other solids into jugs. These jugs are available from the ESF or UCDH Health Physics. Central Storehouse stocks secondary containers.
- Do not place liquid from a primary vial into a liquid waste jug. The primary vial will be picked up separately.
- Seal the jug and complete an EH&S waste tag. To request a waste pick-up, use the [Radioactive Waste Request form](#). If you are located at UCDH, call Health Physics (916-734-3355) to request a waste pick-up.
- Mixed waste is defined as “a waste that has a chemical hazard (i.e., corrosive, toxic, flammable) in addition to radioactivity”. These wastes are extremely expensive to dispose of. If your laboratory anticipates generating any amount of mixed waste, please contact EH&S (530-754-5058) for disposal options prior to generating waste.

F. Waste Minimization Techniques

- Use smaller (10 ml) scintillation vials instead of the larger (20 ml) vials.
- Use radioisotopes with half-lives less than 120 days.
- Separate short-lived radioisotopes (half-life less than 120 days) from long-lived radioisotopes in dry waste.
- Separate organic, toxic, or corrosive solutions from aqueous nontoxic or noncorrosive solutions.
- Do **not** put dry radioactive waste containers near regular trash containers. This will reduce the possibility that non-radioactive waste will be inadvertently put into the radioactive waste container.

- If applicable, carefully run a count rate meter at a rate of 2 inches per second and 1/2 inch above the surface of potentially contaminated dry waste. If the dry waste is indistinguishable from the background, deface all radioactive symbols and put in a regular trash container.
- Aqueous solutions with pH between 2 and 5, or 10 and 12.5 should be normalized prior to placement in the approved EH&S/UCDH Health Physics waste jug. For aqueous solutions with pH less than 2 or greater than 12.5, contact EH&S for disposal instructions.