

## 8.0 Radioactive Waste

### 8.1 Solid Radioactive Waste Management

Solid radioactive waste is disposed of by land burial at licensed, low-level radioactive waste facilities or by holding short-lived wastes for radioactive decay until their radiation levels are indistinguishable from background, and then disposing of them as ordinary waste. Because the availability of land burial sites is subject to political and technical limitations, and the space available for decaying short-lived wastes is limited, radioisotope users should make every effort to minimize the volume of radioactive wastes generated in their laboratories.

All solid radioactive waste is packaged by users and then transferred to DRS personnel for treatment by decay-in-storage or other method of final disposal.

As much as possible, wastes must be segregated according to isotopes. It is especially important to segregate dry wastes containing tritium (H-3) and carbon-14 (C-14) from other long-lived isotopes.

Solid wastes should be collected, stored, and packaged in containers lined with plastic bags with a thickness of at least four mils of LDPE, clear or transparent yellow in color, and bearing the radiation hazard symbol. The containers must be labeled with the radiation hazard symbol and the words "*Caution–Radioactive Material*". Individual bags should be no greater than 30 gallons in volume. Laboratories are responsible for providing their own disposal containers and bags.

*No freestanding liquids, lead, sharps or animal carcasses/tissue* shall be disposed of in solid wastes. If lead cannot be decontaminated, it should be packaged separately for collection. See section 8.3 for handling of radioactive sharps.

**MIXED WASTE CAUTION:** Activities that generate wastes that are classified as both hazardous chemical wastes and radioactive wastes require special handling and incur high disposal costs. *Mixed waste generation should be minimized to the extent practical.* More information is provided in section 8.7 to follow.

It is the responsibility of the laboratory personnel to comply with segregation, collection, packaging, and labeling requirements and to secure all wastes for removal from the laboratory. DRS will not handle any package that does not conform to the requirements of this section or which, in their opinion, may present a safety hazard to waste-handling personnel or members of the public. Containers/packages of waste that are not properly packaged and labeled must be promptly corrected.

Prior to pick-up by DRS, each container must have a completed *Radioactive Waste* tag attached to it. These tags are available from DRS. Appendix B gives instructions for completing these tags. When waste has been properly prepared, log on to DRS website at: <http://www.drs.illinois.edu/radiationsafetyapp/Waste/PickupRequest.aspx/> and complete the online pickup request.

## 8.2 Liquid Scintillation Counting Vials, Glassware, and Plastic Containers

Empty liquid scintillation counting vials that contained media with a concentration of C-14 or H-3 less than 0.05 micro-Curie per milliliter ( $\mu\text{Ci/ml}$ ) need not be decontaminated and should be disposed of with the regular, non-radioactive solid waste. Ensure that vials have been properly emptied and “radioactive material” labels have been removed or defaced.

Used vials may be decontaminated by washing; alternatively, emptying and then discarding into the appropriate radioactive waste container is acceptable. Segregate wastes by radionuclide half-life ( $\leq 120$  days and  $> 120$  days).

Most glass items (e.g., test tubes, dishes) can be decontaminated by routine washing or an overnight soaking with an industrial-strength detergent and re-used.

## 8.3 Radioactive Sharps

Radioactive sharps are hazardous items that require special precautions and handling. If the following items have come into contact with radioisotopes, dispose of them in containers specifically designed for sharps that bear a *Caution–Radioactive Material* label listing isotope and date:

- Needles and syringes,
- Pasteur pipettes,
- Scalpels and razor blades,
- Microscope slides and coverslips,
- Glassware that cannot be decontaminated.

Sharps containers are closable, puncture-resistant, leak-proof on the sides and bottoms, and are typically available in 1-quart, 2-gallon, and 8-gallon sizes.

Most glassware, such as liquid scintillation vials and test tubes, is easily decontaminated as described in section 8.2 and should not be routinely discarded as sharps.

When sharps containers are full and properly tagged, enter the appropriate information for pickup and disposal on DRS website at <http://www.drs.illinois.edu/>.