# Safetygram

**NCI-Frederick**

ISM-152 Laboratory Personnel September 2008

## RADIOACTIVE WASTE DISPOSAL

All radioactive waste generated at the NCI-Frederick is picked up, inspected, and packaged for disposal or "Decay in Storage" by Waste Management personnel.

Area Radiation Supervisors and Principal Investigators must ensure that all workers in their programs properly label and store their radioactive waste.

The paragraphs below describe the waste segregation procedures for our various waste categories.

**Solid Waste**

Solid waste is processed by the EHS Waste Management section and will be held for decay in storage and incineration or in interim storage until it is shipped out to an approved disposal facility.

Solid waste will be segregated based on isotopic half-life as follows:

| | |
|---|---|
| Class 1: | 32-P and isotopes with a half-life less than 15 days. |
| Class 2: | 35-S, 125-I Isotopes with a half-life between 15 and 100 days. |
| Class 3: | 3-H, 14-C and isotopes with greater than 100 day half-lives |

Each class of waste must be placed into separate, clear, properly labeled bags. These individual bags are to be placed into the 30-gallon solid waste drums supplied by the Waste Management office. Labels for the clear plastic bags are available from the NCI-Frederick Warehouse (stock #66401279).

**Animal Carcasses**

Animal carcasses or animal parts only (no paper, needles, blood soiled benchkote, etc.) containing radioisotopes must be segregated according to half-lives as previously described and sealed in plastic bags. These bags must be properly labeled to include the isotope(s), number of animals, and total activity. The carcasses must be frozen at time of transfer to EHS.

**Scintillation Vials**

Return used vials to the compartmentalized cardboard containers or double-bag the vials after separating them into the following groups:

a. Tritium ($^{3}H$) and carbon ($^{14}C$) vials containing less than an average of 0.05 microcuries/gram of fluid ($3x10^{4}$ cpm/mL of scintillation fluid) are not considered radioactive for disposal purposes and may be placed with background vials. Tritium ($^{3}H$) and carbon ($^{14}C$) vials containing greater than

an average of 0.05 microcuries/grams of fluid must be kept separate from all other vials.

b. All other vials with a half-life of less than 100 days, such as phosphorus ($^{32}$P) and ($^{33}$P); sulfur ($^{35}$S); chromium ($^{51}$Cr); and iodine ($^{125}$I) will be shipped out for disposal as radioactive waste. Vials must be segregated based on half-life considerations previously described.

All scintillation vials must be labeled with a properly filled out hazardous waste disposal summary sheet and also be labeled for the radioactive content.

**Liquid Waste**

a. Aqueous Radioactive Waste: Beta and gamma emitters may be mixed in a five gallon carboy according to the half-life considerations described for the solid waste except for ($^{35}$S) which must be kept separated out by itself and ($^{111}$In) which should be kept by itself. Do not overfill the carboys and call for a pick-up when the volume of the liquid approaches the shoulder area of the carboy.

The total activity *per 5 gallon carboy* should not exceed the following levels for each radioactive isotope listed:

| | |
|---|---|
| Carbon (14C) | 3 millicuries |
| Tritium (3H) | 5 millicuries |
| Sulfur (35S) | 4 millicuries |
| Iodine (125I) | 1 millicurie |
| Chromium (51Cr) | 1 millicurie |
| Phosphorous (33P) | 1 millicurie |
| Phosphorous (32P) | 1 millicurie |
| Indium (111In) | 1 millicurie |

b. High activity, low volume aqueous radioactive waste (>1 millicurie in one liter or less) should be isolated in a separate container.

c. Hazardous Radioactive Waste: This waste type, considered "mixed waste" under current disposal definition, is under dual regulation by the EPA and NRC. Several disposal facilities now exist for treatment of this waste type. However, disposal fees are extremely expensive.

**Samples of mixed waste should not be generated! Seek alternative methods to accomplish your objective if you currently generate this waste type.**

**Sharps**

All sharps must be in a sharps container or sturdy cardboard box, properly labeled with isotope activity, name, date and program number.  Do not place into solid waste drum. Call for separate pick-up.

Questions concerning waste disposal should be referred to EHS on x1384.