

ATTACHMENT K

ITEM 21 WASTE DISPOSAL

I. OVERVIEW

There are four commonly used methods of waste disposal: release to the environment through the sanitary sewer or by evaporative release; decay-in-storage (DIS); transfer to a burial site or back to the manufacturer; and release to in-house waste. With the exception of patient excreta and generally licensed in-vitro kit exemptions, nothing in these guidelines relieves the licensee from maintaining records of the disposal of licensed material.

II. GENERAL GUIDANCE

- A. All radioactivity labels must be defaced or removed from containers and packages prior to disposal. If waste is compacted, all labels that are visible in the compacted mass must be defaced or removed.
- B. Establish procedures to ensure that non-radioactive waste such as leftover reagents, boxes, and packaging material are not mixed with radioactive waste.
- C. Occasionally monitor all procedures to ensure that radioactive waste is not created unnecessarily. Review all new procedures to ensure that waste is handled in a manner consistent with established procedures.
- D. In all cases, consider the entire impact of various available disposal routes. Consider occupational and public exposure to radiation, other hazards associated with the material and routes of disposal (e.g., toxicity, carcinogenicity, pathogenicity, flammability), and expense.
- E. In view of the recent problems with shallow-land burial sites used by commercial waste disposal firms, licensees are encouraged to reduce the volume of waste sent to these facilities. Important steps in volume reduction are to segregate radioactive from nonradioactive waste, to hold short-lived radioactive waste for decay in storage, and to release certain materials into the sanitary sewer in accordance with AAC R12-1-436.
- F. In all cases, the applicant should check for any local restrictions dealing with the disposal of radioactive and/or hazardous wastes.

III. MODEL DISPOSAL PROCEDURES

A. Disposal of Liquids and Gases

Liquids may be disposed of by release to the sanitary sewer or evaporative release to the atmosphere in accordance with levels authorized in Article 4, Schedule B. This does not relieve the licensee from complying with other regulations regarding toxic or hazardous properties of these materials.

- 1. Rules for disposal in the sanitary sewer appear in AAC R12-1-436. Material must be readily soluble or dispersible in the water. **(Excreta from patients undergoing medical diagnosis or therapy is exempt from all the above limitations.)** Make a record of the date, radionuclide, estimated activity that was released (in millicuries or microcuries), and of the sink or toilet used to dispose of the radioactive waste.

2. Limits on permissible concentrations in effluents to unrestricted areas are listed in Schedule B of Article 4 located in Title 12. Make a record of the date, radionuclide, estimated activity that was released (in millicuries or microcuries) and estimated concentration, and site at which the material was released.
3. Liquid scintillation-counting media containing 0.05 microcurie per gram of H-3, C-14, or I-125 may be disposed of without regard to its radioactivity. Make a record of the date, radionuclide, estimated activity (in millicuries or microcuries), calculated concentration in microcuries per gram and how the material was disposed of. The licensee must keep in mind that this method does not relieve the licensee from complying with other rules regarding toxic or hazardous materials.

B. Disposal by Decay-in-Storage (DIS)

Short-lived material (physical half-life less than 120 days) may be disposed of by DIS. If you use this procedure, keep material separated according to half-life.

1. Consider using separate containers for different types of waste, e.g., capped needles in one container, other injection paraphernalia (syringes, swabs, and gauze) in another, and unused dosages in a third container. Smaller departments may find it easier to use just one container for all DIS waste. Because the waste will be surveyed with all shielding removed, the containers in which waste will be disposed of must not provide any radiation shielding for the material.
2. When the container is full, seal it with string or tape and attach an identification tag that includes the date sealed, the longest-lived radioisotope in the container, and the initials of the person sealing the container. The container may then be transferred to the DIS area.
3. Decay the material for at least 10 half-lives and/or follow the steps in D, below.
4. Prior to disposal monitor each container as follows:
 - a. Check your radiation detection survey meter for proper operation;
 - b. Monitor in a low-level (less than 0.05 mR/hr) area;
 - c. Remove any shielding from around the container;
 - d. Monitor all surfaces of each individual container;
 - e. Discard in waste only those containers that cannot be distinguished from background. Record the date on which the container was sealed, the disposal date, and type of material (e.g., paraphernalia, unused dosages). Check to be sure no radiation labels are visible.
 - f. Containers that can be distinguished from background radiation levels must be returned to the storage area for further decay or transfer for burial.
5. If possible, Mo-99/Tc-99m generators should be held for 60 days before being dismantled because of the occasional presence of a long-lived contaminant. When dismantling generators, keep a radiation detection survey meter (preferably with a speaker) at the work area. Dismantle the oldest generator first, then work forward chronologically. Hold each individual column in contact with the radiation detection survey meter in a low-background (less than 0.05 mR/hr) area. Log the generator date and disposal date for your waste disposal records. Remove or deface the radiation labels on the generator shield.

C. Transfer for Burial

Only waste determined to not be radioactive may be buried. Radioactive waste may be transferred to a waste site authorized for its disposal. For your record of burial disposals, keep the consignment sheet that the transfer agent gave you. The commercial waste disposal service used will be:

Name	City	State
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Radioactive Materials License No.: _____

D. Release to In-house Waste

Waste from in vitro kits that are generally licensed pursuant to AAC R12-1-306(F) are exempt from waste disposal rules. Radioactive labels should be defaced or removed. There is no need to keep any record of release or make any measurements.

E. Returning of Used Generators to the Manufacturer

Used Mo-99/Tc-99m generators may be returned to the manufacturer. This permission does not relieve licensees from the requirement to comply with Article 15 of Title 12, Chapter 1 of the Arizona Administrative Code (AAC) or Department of Transportation (DOT) regulations.

1. Retain the records needed to demonstrate that the package qualifies as a DOT specification 7A container (see 49 CFR 173.415(a)).
2. Assemble the package in accordance with manufacturer's instructions.
3. Perform the dose rate and removable contamination measurements required by 49 CFR 173.475(i).
4. Label the package and complete the shipping papers in accordance with the manufacturer's instructions.

SIGNATURE

DATE