

# Decayed Waste: Proper Safety Procedures

Some radioactive wastes, particularly those at medical facilities, can be disposed of in non-radioactive waste streams if the waste is allowed to decay for a sufficient amount of time and all radiation labels and markings are removed or obscured.

The waste must be appropriately surveyed prior to disposal to verify the absence of radioactivity. Procedures for gamma emitters must specify and survey results must indicate that residual radioactivity is indistinguishable from background. Theoretically there is always some residual and its detection is directly dependant upon the sensitivity of the system used to measure radioactivity in the waste.

In an effort to limit liability and comply with permits and regulations, operators of municipal landfills and medical waste incinerators and autoclaves may install very sensitive detection systems (with 2"×2" NaI scintillation detectors) to screen shipments of waste to be buried or burned. Some operators also use portable "microR" survey meters (usually equivalent to 1"×1" scintillation detectors) to perform surveys.

So, if surveys of waste are performed utilizing an instrument, such as a side window GM detector with a minimum thickness of 35 mg/cm<sup>2</sup>, findings for gamma-emitting waste could be indistinguishable from background at levels of radioactivity that would be detectable with more sensitive equipment.

The chance becomes even more likely if the short-lived waste contents warrant disposal as biomedical waste, since this type of waste is often handled individually and a survey may be made at the surface of the box or bag, as opposed to several feet outside a truck or metal container.

Operational policies of landfill operators, waste haulers and processors may direct them to either return the waste to the generator or have the generator send out a

representative to retrieve the waste.

Significant costs may be incurred by the generator and recovering the "hot" items can be difficult as well as dangerous. To help avoid these complications, the North Dakota Radiation Control Program offers the following suggestions:

- Store all waste to be disposed of by the decay-in-storage method at least 10 half-lives before releasing; and consider storage for an additional 10 half-lives if radioactivity is detected or if surveys are performed with instruments less sensitive than a 1"×1" scintillation detector.
- Segregate the waste by half-life to minimize the space required for storage.
- Make sure the waste is decayed to levels indistinguishable from background and that the results of the survey are documented.
- Survey the waste with careful technique and with the most sensitive radiation detection instrument available.
- Know where the waste is going and how it is surveyed so there won't be any surprises.
- Handle all articles involved with radiopharmaceutical administration as contaminated until surveys confirm otherwise (i.e., intravenous tubing, gloves, alcohol preps, injection pads, lab specimens, therapy patient wastes, diapers, chux, eating utensils).
- Develop your own detection system and procedures to monitor all waste for radioactivity before it leaves the facility.

Remember, the licensee is required to follow specific radiation safety procedures. Ultimate responsibility for control of radioactive material and decayed waste rests with the generator. If you have any questions about these suggestions, please contact the Radiation Control Program at 701.328.5188.