

RADIOACTIVE MATERIAL SEWER DISPOSAL

(For assistance, please contact EHS at (402) 472-4925, or visit our web site at <http://ehs.unl.edu/>)

The purpose of this document is to document the suggested procedures to be followed in the laboratory when disposing radioactive liquids via the sanitary sewer. Disposal via this method is restricted to sanitary sewers that are connected to a Public Owned Treatment Works (POTW); disposal to on-site septic systems is not permitted. This document supplements the EHS Safe Operating Procedure (SOP), **Sewer Disposal List**; all conditions of that SOP apply to disposal of radioactive liquids.

Step 1: Determine if the liquid is acceptable for sewer disposal.

- The chemical matrix of the radioactive liquid must be listed on the UNL **Sewer Disposal List**, which indicates that the POTW has determined that the discharge is acceptable. All liquids that are not on the **Sewer Disposal List** or do not conform to the conditions of the **Sewer Disposal List** must be tagged for collection by EHS.
- Determine the activity of the radioisotope through process knowledge or direct testing (Appendix A). Combine the activity to be disposed with activities previously disposed in the current month. The total activity should not exceed the monthly allowable limits. Monthly allowable limits are: $^3\text{H} = 4.0 \text{ mCi}$, $^{14}\text{C} = 0.8 \text{ mCi}$, and all other radionuclides combined = 0.8 mCi.

Step 2: Prepare for disposal.

- Stage a meter near the sink (for all radionuclide except H-3) to monitor for contamination during the disposal process.
- Use absorbent padding on surfaces where containers are staged to prevent contamination.
- Don appropriate PPE (e.g., laboratory coat, gloves and eye protection).

Step 3: Perform the disposal.

- Order containers from least to greatest activity radioactivity to minimize potential for spread of contamination.
- Pour the waste directly into the drain minimizing contact with the sink bottom and splashing.

Step 4: Cleanup.

- Flush the sink thoroughly with water (5 minutes is recommended).
- Survey the sink and counter.
- If contamination is present, clean and re-survey. Continue process until contamination is less 200 dpm based on a survey area of at least 100 cm².

- Include sink locations in monthly surveys. ***Disposal is considered use of radioactive material and necessitates recording of a monthly survey regardless of whether any other use of radioactive material occurred in the laboratory!***

Step 5: Complete and file records.

- Record disposal information (e.g., date of disposal, radionuclide, radioactivity) on the Sanitary Sewer Disposal Log (Appendix B). For convenience and quick reference, post the log near the sink. A separate log should be maintained for each sink used for disposal of radioactive materials.
- Document survey results in the Radiation Safety Logbook.
- Send a copy of the completed Sanitary Sewer Disposal Log to Environmental Health & Safety (EHS): **Radiation Safety; EHS, EC – 0824**. File the original in the radioactive material use logbook.

The information in this SOP is not intended for incorporation into UNL's Radioactive Material License; nor is it intended to modify, restrict, or otherwise change the conditions of the same.

Appendix A

Procedure for Determining Radioactivity in Liquid Waste

1. Pipet 1 mL of the liquid waste into an empty scintillation vial.
2. Add 10 mL of scintillation cocktail.
3. Run vial through the Liquid Scintillation Counter.
4. Acquire DPM from the LSC results.
5. Convert DPM to $\mu\text{Ci/mL}$.
 $(\text{DPM}) \times (4.545 \times 10^{-7}) = \mu\text{Ci/mL}$
6. Convert $\mu\text{Ci/mL}$ to μCi .
 $(\mu\text{Ci/mL}) \times (\text{total mL in waste bottle}) = \mu\text{Ci}$
7. Convert μCi to mCi.
 $(\mu\text{Ci}) \times (1.0 \times 10^{-3}) = \text{mCi}$

