



Technical Safety



RADIATION PROCEDURES MANUAL

Procedure Cover Sheet

Procedure Title: Sewage Disposal of Non-Hazardous, Non-Toxic
Radioactive Liquids

Procedure Number: TSO-08-09-REV 1

Effective Date: September 1, 2008

Approved By:  Date: 19 May, 2009
Technical Safety Office Director



Procedure #: TSO-08-09-REV 1
Procedure Title: Sewage Disposal of Non-Hazardous, Non-Toxic Radioactive Liquids
Approval Date: May 19, 2009
Effective Date: September 1, 2008

A. INTRODUCTION

Non-hazardous, non-toxic (NHNT) liquid waste generated on campus may be disposed of through the public sewage system if the conditions in 10CFR20.2003 are met. The requirements mentioned therein are as follows:

1. The material is readily soluble (or is readily dispersible biological material) in water; and
2. The quantity of licensed or other radioactive material that the licensee releases into the sewer in 1 month divided by the average monthly volume of water released into the sewer by the licensee does not exceed the concentration listed in table 3 of appendix B to part 20; and
3. If more than one radionuclide is released, the following conditions must also be satisfied:
 - a. The licensee shall determine the fraction of the limit in table 3 of appendix B to part 20 represented by discharges into sanitary sewerage by dividing the actual monthly average concentration of each radionuclide released by the licensee into the sewer by the concentration of that radionuclide listed in Table 3 of appendix B to part 20; and
 - b. The sum of the fractions for each radionuclide required by paragraph (a)(3)(i) of this section does not exceed unity; and
4. The total quantity of licensed and other radioactive material that the licensee releases into the sanitary sewerage system in a year does not exceed 5 curies (185 GBq) of hydrogen-3, 1 curie (37 GBq) of carbon-14, and 1 curie (37 GBq) of all other radioactive materials combined.

B. PURPOSE

This procedure specifies criteria and methods for sewage disposal of NHNT liquid waste.

C. REQUIRED MATERIAL(S)

The minimum required protective clothing to be worn by TSO personnel while disposing of NHNT liquid waste will be:

- A plastic lined lab coat or a lab coat and a plastic apron
- Plastic sleeves
- Plastic or rubber gloves
- Face shield
- Long pants
- Close toed shoes
- Thermoluminescent Dosimeter (TLD)

Any deviation from this requirement will require written permission from the RSO.

D. PROCEDURE

For each disposal of radioactive liquid waste to the sanitary sewer, the TSO will proceed as follows:

1. Check that the waste being discharged is soluble (or is biological material that is readily dispersible) in water.
2. Determine the activity of all nuclides that can be discharged by using the information from prior, similar discharges and the information in 10CFR20, Appendix B.
3. Determine the activity of all nuclides to be discarded, their monthly average concentration, and the cumulative annual activity.
4. If more than one radioisotope is released, the sum of the ratios of the average monthly discharge of a radioisotope to the corresponding limit in 10 CFR Part 20, Appendix B, Table 3 must not exceed unity.
5. Total quantity of licensed material released into the sanitary sewerage system in a year does not exceed 185 GBq (5 Ci) of H-3 (tritium), 37 GBq (1 Ci) of C-14, and 37 GBq (1 Ci) of all other radioisotopes combined (10 CFR 20 Subpart K).
6. Record all the information on RPR 54J (see .
7. Discharge liquid waste slowly to minimize splashing with water running, to be sure that the material moves out of the sink and into the sewer system.
8. Survey the sink and surrounding work surfaces to confirm that no residual material or contamination remained in the sink or on work surfaces. Decontaminate as appropriate.
9. Decontaminate all areas or surfaces if found to be contaminated.
10. Log RPR 54J and maintain records of each radioisotope and its quantity and concentration that is released into the sewer system that demonstrate compliance with the regulatory limits for total quantity released and concentrations released by the licensed facility.

The purpose of the sewage disposal work sheet is to ensure Idaho State University compliance with NRC regulations 10CFR20 for the disposal of non-hazardous, Nontoxic, Nonflammable, aqueous liquid radioactive waste into the sanitary sewer.

The procedure for completing form RPR 54J is:

1. Enter in the space provided the waste tag number, nuclide, activity, and the monthly and yearly release limits for the nuclide (See 10 CFR 20 appendix B).
2. Obtain the monthly and yearly activities disposed of to date from previous RPR 54J forms and fill into the designated fields.
3. Obtain the water flow rates for the Physical Science building for 12 months preceding the proposed discharge and compute the average monthly water flow rate (AMF). Enter the resulted number in the space provided. The water flow rates can be obtained from the Fiscal Officer, Bonnie Knutson, in the Facilities Office via email at knutbonn@isu.edu or at her office at 282-3766. ***Note: The AMF should be converted to milliliters to conform to the units specified in appendix B of 10CFR20.**
4. To ensure the release limits for radionuclides specified in 10CFR20 are not exceeded, the Radiation Safety Committee established a safety factor (SF) of ten. Therefore, the discharge safety Volume (DSV) is computed by dividing the AMF by the SF.

Prior to each disposal of NHNT radioactive liquid to the sanitary sewer the TSO representative will complete form RPR 54J and submit it to the RSO for approval. **Radioactive material will not be released into the sewer without written approval from the RSO.**

All disposals to the sanitary sewer will be performed by the TSO. The sewer disposals will be performed in a sink that is a part of the public system specifically designated for this purpose. The sink used for sewage disposal is located in the Physical Science Building Rm-102 in the hood.

The TSO representative, at the completion of each approved radioactive material discharge, will attach form RPR 54J to the Radioactive Isotope Disposition record (RPR 13C) and place these forms in the sewage disposal section of the Radioactive Waste Log.

REFERENCES

U.S. Nuclear Regulatory Commission: *10 CFR 20*



Procedure #: TSO-08-09-REV 1
Procedure Title: Sewage Disposal of Non-Hazardous, Non-Toxic Radioactive Liquids
Approval Date: May 19, 2009
Effective Date: September 1, 2008

REVISION TRACKER

Revision 1	September 1, 2008	Original Procedure
------------	-------------------	--------------------