

Technologically Enhanced Naturally Occurring Radioactive Material (TENORM) Landfill Licensing Guidelines

Definitions: **TENORM** stands for **T**echnologically **E**nhanced **N**aturally **O**ccurring **R**adioactive **M**aterial. When materials are removed from the earth and concentrated by human activities, such as mining or oil and gas production, NORM becomes TENORM. TENORM is created in the oil and gas industry and found in filter socks, tank bottom sludge, and scale that forms inside well pipes and equipment.

A **picocurie** describes the amount of radioactivity found in a gram of a material. TENORM concentrations are measured in picocuries per gram (pCi/g).

Landfills requesting the approval to accept TENORM waste in concentrations between 5 pCi/g and 50 pCi/g of the total Radium-226 and Radium-228 content will need to:

- Apply for a specific radioactive material license issued by the North Dakota Department of Health (Department). License application forms are available on the Department website <http://www.ndhealth.gov/AQ/RAD/forms/SFN%208418%20RAM%20License%20Applicati%20on.pdf>. The following information must be included with the application:
 - A copy of the applicant's operating and emergency policies/procedures.
 - A facility diagram designating all restricted areas where TENORM waste will be transported through and stored within the facility.
 - Information to complete an environmental compliance background review, including consent to a criminal history check and disclosure of personal and business information as listed in NDRHR 33-10-23-12(3). Please contact the Department for more information regarding the submission of these materials.
 - The appropriate license fee as listed in NDRHR 33-10-11, Appendix A, Category 4.A.

Guidance for completing the application is available in Section 8 of NUREG-1556, Volume 18 <http://pbadupws.nrc.gov/docs/ML0037/ML003779351.pdf>.

- Provide financial assurance in the amount of \$1,125,000.00 in the form of a surety bond or insurance policy. These funds guarantee that decommissioning costs will be paid. The model surety bond is available on the Department website http://www.ndhealth.gov/AQ/RAD/forms/Payment_Surety_Bond.pdf.

- Provide a standby trust agreement for which the surety bond or insurance policy funds will be payable for the decommissioning costs. The model standby trust agreement is available on the Department website http://www.ndhealth.gov/AQ/RAD/forms/Standby_Trust_Agreement.pdf.
- Establish a Department approved radiation survey procedure/policy to detect and quantify accepted TENORM waste materials.
- Maintain a Radiation Safety Program for the protection of workers, members of the public and the environment.
- Designate an individual to oversee the radiation safety program (radiation safety officer) who meets the qualifications in NDRHR 33-10-23-28.
- Possess a Special Waste Landfill or Large Volume Industrial Waste Landfill permit issued by the North Dakota Department of Health, Division of Waste Management specific to the acceptance of the concentrations of these materials.