

leachate) and reach ground water. (By contrast, NRC requirements address waste characteristics, but NRC does not require specific treatment methods for waste prior to disposal. However, low-level radioactive waste is generally compacted, which reduces volume and increases stability but also increases radionuclide concentrations on a per unit volume basis. In addition, liquids and chelating agents must be minimized or otherwise managed to limit their impact on facility performance.)

The RCRA Universal Treatment Standards (UTS) are located in 40 CFR part 268. Most are in the form of concentration limits of the respective hazardous constituents, but some are in the form of specified treatment technology (particularly in the case of hard-to-treat wastes). The UTS are based on the level of reduction that can be achieved by available technology, not on risk reduction. However, by reducing the concentration of toxic constituents, the practical effect is some reduction in risk. We would appreciate comments on the need for measures, such as waste treatment to a specific waste form, that would help ensure that radionuclide concentrations established under the approach outlined today remain protective when implemented.

We expect this approach to require that low-activity mixed waste comply with the RCRA UTS before allowing disposal at RCRA-C facilities, in keeping with existing restrictions. To the extent that treatment involves some kind of waste stabilization or solidification, we would consider this advantageous to keeping radionuclides immobilized in the disposal cell. We ask readers whether they believe there are situations in which compliance with the UTS may be unnecessary or inadvisable for wastes containing radionuclides. We request comment on the need to require a certain waste form for LAMW and the desirability of having standards (e.g., concentrations) that are dependent on waste form. We also request comment on whether a rule should explicitly require segregating treated LAMW meeting the UTS from untreated hazardous waste (waste disposed of before treatment standards were required). This would limit potential interactions with chemicals that could influence the ability of radionuclides to move in the environment. We believe this is probably not necessary, as disposal cells that were open prior to the treatment requirements are likely to have been closed for some time.

3. RCRA Disposal Facility Operating Standards

RCRA is also explicit about how the facility must approach operational functions, both while the facility is operating and during the closure and post-closure phases. In particular, facility operators must follow specific procedures regarding (see 40 CFR part 264):

- Inspections—the facility operator must inspect equipment and procedures in accordance with a written schedule (including inspecting the installation of the liner and leachate collection system), must inspect the operation of the landfill after storms, and must inspect the leachate collection system regularly during operation and post-closure;
- Recordkeeping—the facility operator must maintain inspection records for at least three years and maintain records detailing the location, dimensions, and contents of disposal cells;
- Monitoring/corrective action—the facility operator must conduct a ground-water monitoring program and implement corrective action when a hazardous constituent is detected in ground water at concentrations that exceed those listed in the facility's permit;
- Closure/post-closure—the facility operator must install a permanent cap on the disposal cell that complies with engineering specifications, must have an approved closure plan that minimizes the need for further maintenance, must perform maintenance that becomes necessary throughout the post-closure period, and must submit a survey plat showing the locations and contents of disposal cells.

4. How Does AEA Licensing Compare to RCRA Permitting?

Both the NRC and EPA have designed their disposal regulations with the intent of isolating waste from the environment to minimize exposures from the radiological or chemical constituents (in this document, we are focusing on the NRC requirements for LLRW disposal under 10 CFR part 61). There are a number of broad similarities between the two regulatory approaches that could translate into "simplified" AEA oversight. For example, both the AEA and RCRA:

- Accept and regulate near-surface disposal as a means to contain and isolate waste;
- Include measures to limit infiltration into the disposal cell (such as a cover/cap);
- Require site monitoring during operations;

- Require continued maintenance after facility closure; and
- Recognize that there are certain site characteristics to be avoided (such as floodplains and other geologic hazards).

However, there are also some noteworthy differences in the technical requirements for waste disposal. Some of these differences exist because of the way the regulations are written and implemented. RCRA regulations are more prescriptive and design-based than are the NRC requirements. Although both systems have basic requirements for site selection, RCRA does not require a landfill seeking a hazardous waste disposal permit to conduct performance assessments (site-specific modeling) to assess how waste disposal at the facility will protect human health and the environment after facility closure. Instead, by requiring a uniform (minimum) level of technology designed to provide containment and prevent releases, RCRA places the burden on the technology to perform as expected and thereby protect the public and environment. For example, RCRA requires that a disposal cell have a double liner constructed of certain materials and a leachate collection system capable of performing to certain specifications. RCRA regulations say, in effect, "this level of technology is protective." An important point is that, under RCRA, leachate from a hazardous waste disposal cell is hazardous waste, and must be collected and treated accordingly. Similarly, leachate containing radionuclides could be newly generated mixed waste and be treated accordingly. We request comment on how we should address radionuclides in the LAMW leachate, particularly if the LAMW has been disposed of under some exemption from NRC requirements.

On the other hand, NRC, in its regulations under the AEA, focuses more on standards of performance, rather than on construction specifications. The NRC has established a maximum dose level to the public; however, the burden is on the facility operator to satisfy the licensing authority that the facility, as sited and constructed, will not allow that dose to be exceeded. Thus, the NRC regulations require a detailed, site-specific operational and post-closure performance assessment to show that the facility will perform adequately. NRC regulations say, in effect, "show that the level of technology you select, combined with the characteristics of the site you have selected, will meet this level of protection." License conditions, often including monitoring facility performance, are then established to