Savannah River Site
Citizens Advisory Board
Recommendation 226
Proposed National Policy on Buried Alpha Waste

Background

The U.S. Atomic Energy Commission (AEC) first identified transuranic (TRU) waste as a separate category of radioactive waste in 1970, and it was later defined by AEC in 1973 as waste containing greater than 10 nCi/g of TRU alpha-emitting radionuclides. Due to the hazards associated with the increased concentrations of long-lived alpha-emitting radionuclides, this waste warranted more stringent handling and disposal considerations than low-level waste (LLW). Before 1970, the same waste, known as "alpha waste" then, was handled in a manner similar to LLW and was generally disposed of by shallow land burial or other similar disposal techniques. DOE revised the definition of TRU waste in 1982, increasing the lower limit of TRU alpha-emitting radionuclides with half-lives greater than 20 years from 10 to 100 nCi/g. Around this same time period, the U.S. Nuclear Regulatory Commission (NRC) revised its classification of LLW, specifically noting that LLW containing more than 100 nCi/g of TRU radionuclides was not suitable for disposal by shallow land burial.

To capture AEC radioactive waste disposal practices involving alpha-contaminated materials that were in effect prior to the 1970s, DOE published a report on transuranic wastes buried at DOE sites (Ref. 1). Allowing for radioactive decay since burial, the Savannah River Site (SRS) has about 18,300 curies of buried alpha activity, located in the Burial Ground Complex. This is about one third, by curies, of the alpha waste buried at Hanford, 60 percent of the buried alpha waste at Idaho National Laboratory (INL), and about the same amount as at Los Alamos National Laboratory (LANL). Nevada Test Site (NTS) and Oak Ridge National Laboratory (ORNL) alpha waste have much smaller amounts of alpha activity.

The Burial Ground Complex is the facility used as a disposal site for alpha wastes from SRS activities and occupies approximately 195 acres in the central section of the site. The southern area of the complex is called the Old Radioactive Waste Burial Ground (ORWBG) which occupies 76 acres of the complex. The ORWBG received wastes from 1952-1974 with only a small quantity of waste being disposed in 1974. The ORWBG facility is composed of earthen trenches, generally 20 feet by 20 feet deep, designed for low-level radioactive waste disposal.

Final closure of the ORWBG is planned under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as agreed in the SRS Federal Facility Agreement. In 1998, SRS completed the installation of a four-foot thick low-permeability native soil cover under a CERCLA Interim Action to reduce surface radiation levels, reduce storm water infiltration to the waste layer, and mitigate contaminant migration to the groundwater. The final [2002] Record of Decision for the General Separations Area Consolidation Unit, which includes the ORWBG, called for the addition of a low-permeability geosynthetic cover system to the native soil cover for the ORWBG making it even more robust and protective of the environment.

Also in 1998, the SRS Citizens Advisory Board (CAB) formed the ORWBG Focus Group (FG) to evaluate the need for further remediation and closure of the 76-acre site. The FG evaluated the current and future health risks posed by the ORWBG and its contaminants and presented its findings to the SRS CAB. The two and one-half year study resulted in a report, entitled *Long Range Analysis of the Need for Cleanup and Closure of the Old Radioactive Waste Burial Ground – Human Health Risk Analysis* (Ref. 2).

In reference to alpha buried wastes, the ORWBG FG concluded that: (1) the risk at ORWBG is

so low as to be considered negligible; and (2) the alpha wastes in the ORWBG should remain buried. This conclusion was based upon determining the overall risk from buried alpha wastes to be very low and that only a small fraction of the DOE total buried alpha waste reside in the ORWBG. Furthermore, based upon the existing groundwater monitoring system, there is no evidence that any Plutonium transport beyond the ORWBG is occurring, or ever has occurred. In addition, any attempt to exhume the waste would be cost prohibitive and too dangerous to site workers. Such an excavation would also create an additional large volume of a secondary waste stream requiring disposition.

Comments

At the September 22-23, 2005, DOE Environmental Management Site Specific Advisory Boards (EM SSAB) meeting in Idaho Falls, several presentations were given on DOE's national waste disposition plans and strategy (Ref. 3 and Ref. 4). As a result of these presentations and discussions, a letter was drafted to be signed by all SSAB chairs providing recommendations and commitments to assist DOE with development of the national Waste Management disposition strategies and to further its accelerated cleanup campaign. Although not all SSAB chairs signed the letter (Fernald, Hanford, and Idaho did not sign), it was sent to Mr. James Rispoli, Assistant Secretary for Environmental Management, on December 7, 2005 (Ref. 5).

One of these recommendations suggested that the EMSSAB Chairs participate in the development of a national strategy addressing alpha wastes and their proper disposition, since, as the letter stated, no consistent national policy exists regarding retrieval and/or characterization of these buried wastes. At the September SRS CAB meeting, considerable discussion ensued on this issue prior to the vote by the SRS CAB on whether to have the SRS CAB Chair sign the EMSSAB Chairs letter. In addition, a minority report was provided to document the concerns many CAB members had with the assumption that a national strategy addressing alpha wastes is needed (Ref. 6).

Although no formal written DOE policy exists on how to handle buried alpha waste. DOE's de facto current strategy for managing buried alpha wastes and environmental media, as addressed by Frank Marcinowski (Deputy Assistant Secretary, Office of Environmental Management) during the SSAB meeting, is to address them in the same manner as other environmental restoration issues (i.e., on a site-specific basis working with federal, state, and local regulatory agencies and other stakeholders). Mr. James Rispoli, Assistant Secretary for Environmental Management, confirms this approach in his December 22, 2005 letter (Ref. 7) and states that it is consistent with CERCLA and other regulatory processes governing contaminated waste sites. In addition, the appropriate action at each alpha waste site will depend on several factors including the manner of burial, quantities buried, current and future risks, land-use plans for the facility and nearby area, availability of cost-effective technologies, and other local concerns.

The SRS CAB believes that the above approach for managing buried alpha waste sites on a site-specific basis appropriately reflects the safety and cleanup priorities at SRS. SRS should continue to negotiate with regulators and local citizens in reaching appropriate plans for each site. Further, DOE should continue with CERCLA actions to achieve closure of the ORWBG. The SRS CAB agrees with the conclusions of the original ORWBG FG that the risk at ORWBG is so low as to be considered negligible and that the alpha wastes in the ORWBG should remain buried.

The SRS CAB recognizes and affirms the existing policy on buried alpha waste and likes the site-specific approach that evaluates the risks, costs, safety, and local concerns associated with any retrieval and/or characterization actions.

Recommendation

We do not believe the existing policy should be changed; nevertheless, in the event that a new national strategy for alpha waste is ever developed, the SRS CAB recommends that DOE-HQ:

1) Use a total systems approach that includes all the risks, costs, and safety concerns associated with the different alternatives.
2) Involve the local stakeholders and regulators in evaluating these risks well before the decision is made.

References

1. "Buried Transuranic- Contaminated Waste Information for U.S. Department of Energy Facilities", US Department of Energy, Office of Environmental Management, June 2000. (www.em.doe.gov/integat/buriedtru.html)

2. "Long Range Analysis of the Need for Cleanup and Closure of the Old Radioactive Waste Burial Ground – Human Health Risk Analysis", prepared by the Old Radioactive Waste Burial Ground Focus Group, July 2001.

3. National Low-level/Mixed Low-Level Waste Disposition Strategy, presentation to the EM SSAB Chairs meeting by Christine Gelles, DOE-HQ, September 22-23, 2005.

4. Update on DOE's National Waste Disposition Plans, presentation to the EM SSAB Chairs meeting by Frank Marcinowski, DOE-HQ, September 22-23, 2005.

5. DOE Environmental Management Site Specific Advisory Board letter to Mr. James Rispoli, Assistant Secretary for Environmental Management, December 7, 2005.

6. Minority Report to EM SSAB chairs letter filed by Bill Lawless, SRS CAB vice-chair, to Mr. James Rispoli, Assistant Secretary for Environmental Management, September 27, 2005.

7. Mr. James Rispoli, Assistant Secretary for Environmental Management response letter to Ms. Jean Sulc, Chair Savannah River Site Citizens Advisory Board, December 22, 2005.

Agency Responses
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