

“Plutonium and Uranium Stored in Vaults” by: (1) Heating or repackaging the material into better containers, and (2) dissolving some materials in the SRS canyon facilities to chemically remove impurities or radioactive decay products, and converting the resulting purified solutions to a metal, an oxide, or a glass (*i.e.*, vitrification). On February 21, 1996, DOE issued a Supplemental ROD (61 FR 6633) announcing its decision to stabilize the Candidates for Stabilization material type known as “Other Aluminum-Clad Targets” by dissolving them in acid in the SRS canyon facilities and transferring the resulting nuclear material solution to the high-level waste (HLW) tanks for future vitrification in the Defense Waste Processing Facility.

The environmental impacts of disposing of low-level waste (LLW), and managing transuranic waste (TRUW) pending disposal, are analyzed in the *Savannah River Site Waste Management Environmental Impact Statement* (SRS WM EIS) (DOE/EIS-0217, July 1995).¹ In preparing the SRS WM EIS, DOE recognized the difficulty in trying to comprehensively identify all of the wastes that would require treatment over a 30-year period. Therefore, in providing examples of different waste types, DOE used terms such as “typical” and “includes” to clearly indicate that other materials, such as those identified in this Amended ROD, could also be considered for waste treatment, storage, and disposal as long as those other materials met the definitions of the various waste categories in the SRS WM EIS.

Action alternatives analyzed in the SRS WM EIS included three waste treatment configurations (limited, moderate, and extensive), all of which were found to protect human health and the environment, meet applicable storage and disposal requirements, and use reasonable treatment, storage, and disposal technologies. Each of these

treatment configurations was analyzed in the context of multiple waste volume scenarios (expected, minimum, and maximum) which included projections of waste volumes the SRS would need to manage over a 30-year planning period (1995 through 2024). In a September 22, 1995, ROD (60 FR 55249), DOE selected the moderate treatment configuration for its waste management system. On June 28, 2001, DOE issued an Amended ROD (66 FR 34431) announcing its decision to add offsite disposal of certain SRS waste as a management method, consistent with DOE policy.

Other Aluminum-Clad Targets

The Other Aluminum-Clad Targets material type includes 771 cobalt-60 and 1 (one) thulium-170 “slugs”² as well as approximately 150 slugs and assemblies of other materials (*e.g.*, thorium, uranium, and plutonium).

DOE has determined that cobalt-60 and thulium-170 slugs, and potentially the remaining materials in the Other Aluminum-Clad Targets material type, may be disposed of as LLW without additional processing. One form of the Other Aluminum-Clad Targets, plutonium-242 flux monitor pins, may require disposal as TRUW rather than as LLW. In order to qualify for direct disposal the materials must meet the definition of LLW or TRUW,³ whichever is applicable, and meet the waste acceptance criteria of the receiving, treatment, storage, or disposal facility.

Disposing of the cobalt-60 and thulium-170 slugs, and the qualifying remaining Other Aluminum-Clad Targets material type, as LLW would generate only about five cubic meters of LLW, as compared to approximately 1,150 cubic meters of LLW estimated for the processing stabilization alternative previously selected for this material type.⁴ This is a net reduction of approximately 1,145 cubic meters of LLW generation. These materials are currently stored in the L-Area Disassembly Basin, the Receiving Basin

for Offsite Fuels, and the Savannah River Technology Center. The materials in this category that are determined to qualify for direct disposal as LLW will be buried in a shielded container or containers at the SRS or at an offsite facility to ensure that radiation exposure is kept as low as reasonably achievable.

Plutonium and Uranium Stored in Vaults

Similarly, DOE has determined that some of the Plutonium and Uranium Stored in Vaults material type may be disposed of as TRUW without further processing. DOE has already characterized and stabilized about 90 percent of the approximately 3,000 containers of the Plutonium and Uranium Stored in Vaults material type. Characterization and stabilization of the remaining containers is scheduled to be complete by the end of Fiscal Year 2005. During characterization, DOE will determine which of the remaining approximately 300 containers can be directly disposed of as TRUW. Adding TRUW disposal as a management option does not change the characterization process. Disposing of this small portion of Plutonium and Uranium Stored in Vaults as TRUW could result in the generation of about eight cubic meters of TRUW, compared with approximately 130 cubic meters of TRUW estimated for processing this material as described in the IMNM EIS.⁵ If the plutonium-242 flux monitor pins discussed in the preceding section are disposed of as TRUW rather than as LLW, less than two additional cubic meters of TRUW would require management at the SRS, resulting in the generation of less than ten cubic meters of TRUW from this decision. This is a net reduction of approximately 120 cubic meters of TRUW generation below the amount envisioned under previous RODs. In each case, the material to be directly disposed of must meet the TRUW definition and meet the applicable acceptance criteria for packaging, storage and disposal as TRUW. If any material cannot meet the applicable waste acceptance criteria, that material will be stabilized as described in previous RODs.

Potential Environmental Impacts

The IMNM EIS analyzed the potential impacts of a range of alternatives for managing all SRS nuclear materials.

⁵ Table 2-8 of the IMNM EIS indicates that 1,300 cubic meters of TRUW could result from the stabilization processing of the entire Plutonium and Uranium Stored in Vaults material type. DOE estimates that processing the remaining ten percent of these materials would have a potential of generating only ten percent of this amount.

¹ Low-level radioactive waste is radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in section 11e.(2) of the *Atomic Energy Act of 1954*, as amended), or naturally occurring radioactive material. Transuranic waste is radioactive waste containing more than 100 nanocuries (3700 becquerels) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years, except for: (1) High-level radioactive waste; (2) Waste that the Secretary of Energy has determined, with the concurrence of the Administrator of the Environmental Protection Agency, does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; or (3) Waste that the Nuclear Regulatory Commission has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61. [DOE G 435.1-1, Implementation Guide for Use with DOE's Radioactive Waste Management Manual]

² A “slug” is generally a short cylinder, approximately 12–18 inches long by three to four inches in diameter, of fuel, target, or barrier material in the form of pellets, pins, or solid metal that is assembled with other slugs in a tube for insertion in a nuclear reactor as a single rod or combined with others to form an assembly.

³ DOE Guide 435.1-1, Chapters III and IV, July 9, 1999.

⁴ Table 2-11 of the IMNM EIS indicates that 2,300 cubic meters of LLW could result from the stabilization processing of the entire Other Aluminum-Clad Targets material type. Some of this material type has already been processed. DOE estimates the remaining Other Aluminum-Clad Targets that are the subject of this Amended ROD represent approximately 50 percent of this material type analyzed in the IMNM EIS.