

U.S. Department of Energy

Public Scoping Meetings for the Greater-Than-Class C Low-Level Radioactive Waste Environmental Impact Statement

August-September 2007



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Purpose of GTCC NOI

- Announce Department of Energy's (DOE) intent to prepare an EIS for the disposal of GTCC low-level radioactive waste (LLW) and DOE GTCC-like waste
- Initiate the EIS process
- Request public comments on the proposed scope of the EIS and announce public scoping meetings
- Provide information on GTCC LLW and DOE GTCC-like waste inventories, estimated to be about 5,600 cubic meters
- Identify the purpose and need for action



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Purpose of GTCC NOI (cont'd)

- Identify the proposed action
- Identify proposed disposal alternatives (methods and locations)
- Respond to public comments on the Advance NOI, published May 11, 2005
- Identify the Environmental Protection Agency as a cooperating agency and the Nuclear Regulatory Commission (NRC) as a commenting agency



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Purpose and Need for Action

- NRC and Agreement State licensees have generated and will continue to generate GTCC LLW for which there is no permitted disposal facility
- DOE has a statutory responsibility for developing a disposal capability for this waste
- DOE owns or generates certain LLW and transuranic (TRU) waste with characteristics similar to GTCC LLW that may also not have a disposal path, referred to as GTCC-like waste



Legislative Requirements

Low-Level Radioactive Waste Policy Amendments Act of 1985

- Federal government (DOE) responsible for developing GTCC LLW disposal capability

National Environmental Policy Act of 1969

- Requires Federal agencies to consider environmental impacts of proposed actions and alternatives to those actions in decision-making processes



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Legislative Requirements (cont'd)

Energy Policy Act of 2005

- Requires DOE to submit Report to Congress on estimated cost and schedule to complete EIS and Record of Decision (ROD)
 - Report submitted July 2006
- Requires DOE to submit Report to Congress on disposal alternatives under consideration, including the types of information submitted in a 1987 Report to Congress, and to await action by Congress before issuing a ROD
 - Report to be submitted after Final EIS is issued



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What is Low-Level Radioactive Waste (LLW)?

- Low-level radioactive waste includes items that have become contaminated with radioactive material or have become radioactive through exposure to radiation
- Examples include clothing, equipment and tools, discarded items (such as luminous watches, exit signs, and smoke detectors), soil, and water treatment residues that have become contaminated with radioactive material
- Generated from a variety of commercial and government activities such as production of electricity from nuclear utilities, medical treatment, and research



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What is LLW? (cont'd)

- NRC classifies LLW into four classes (Class A, B, C, and GTCC) based on the concentration of specific short-lived and long-lived radionuclides, with GTCC having the highest radionuclide concentrations
 - Class A, B, and C LLW can be disposed of in near surface facilities
 - NRC requires GTCC LLW to be disposed of in a geologic repository licensed by NRC unless alternative method(s) of disposal are proposed to NRC and approved
 - NRC regulations state there may be some instances where GTCC LLW would be acceptable for near surface disposal with special processing or design
 - NRC disposal requirements such as stability and protection against inadvertent intrusion increase from Class A through GTCC



What is GTCC LLW?

- LLW that exceeds the concentration limits of radionuclides established for Class C waste
- Generated from NRC or Agreement State licensed activities throughout the United States
- Can generally be grouped into three waste types:
 1. Activated metals
 2. Sealed sources
 3. Other waste



What is GTCC LLW? (cont'd)

1. Activated Metal

- Primarily generated in nuclear reactors during facility decommissioning
- Consists of components such as thermal shields internal to the reactor that have become radioactive from neutron absorption during reactor operations
- Radionuclides typically include nickel-63, carbon-14, niobium-94, manganese-54, iron-55, and cobalt-60



Activated Metal



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What is GTCC LLW? (cont'd)

2. Sealed Sources

- Typically small, high-activity radioactive materials encapsulated in closed metal containers
- Used for sterilizing medical products, assisting in the diagnosis and treatment of illnesses, and a number of other industrial purposes
- Radionuclides commonly used in sealed sources include cesium-137 and americium-241



Radiography source



What is GTCC LLW? (cont'd)

3. Other Waste

- Includes GTCC LLW that is not activated metals or sealed sources
- Consists of contaminated equipment, debris, trash, scrap metal, and decontamination and decommissioning waste from industrial activities, such as laboratory research
- The radionuclides in these wastes primarily include cesium-137 and americium-241



Contaminated glove boxes prior to decommissioning



What is DOE GTCC-like Waste?

- DOE LLW and TRU waste having characteristics similar to GTCC LLW and which may not have an identified path to disposal
- Owned by DOE or generated by DOE activities
- Waste forms are similar to GTCC LLW (activated metals, sealed sources, and other waste)
- Most is TRU waste that may not qualify for disposal at the Waste Isolation Pilot Plant (WIPP) under the current legislation
- The use of the term “GTCC-like” does not have the intent or effect of creating a new classification of radioactive waste



Summary of Waste Inventories

- Total estimated stored and projected volume and activity of GTCC LLW and DOE GTCC-like waste is approximately 5,600 cubic meters and 140 million curies

GTCC LLW

Total Volume = 2,600 cubic meters
Total Activity = 110 million curies

- Activated metals from nuclear utilities comprise 71% of the total activity of GTCC LLW and GTCC-like waste
- Most of the activated metal waste is projected to be generated between 2035 and 2062

DOE GTCC-Like

Total Volume = 3,000 cubic meters
Total Activity = 31 million curies

- Approximately 2,600 cubic meters is TRU waste



Proposed Action

Construct and operate a new facility or facilities, or use an existing facility for the disposal of GTCC LLW and DOE GTCC-like waste



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Proposed Disposal Alternatives

Alternative	Description
1	<i>No Action</i> —current and future GTCC LLW and DOE GTCC-like waste would be stored at designated locations consistent with ongoing practices
2	<i>Disposal in a Geologic Repository at WIPP</i> —current and future GTCC LLW and DOE GTCC-like waste would be disposed of at WIPP
3	<i>Disposal in a Geologic Repository at Yucca Mountain</i> —current and future GTCC LLW and DOE GTCC-like waste would be disposed of at the proposed Yucca Mountain Repository
4	<i>Disposal at a New Enhanced Near Surface (ENS) Facility</i> —current and future GTCC LLW and GTCC-like waste would be disposed of at a new ENS facility at INL, LANL, WIPP vicinity, NTS, SRS, ORR, or Hanford, or a commercial location
5	<i>Disposal at a New Intermediate Depth Borehole (IDB) Facility</i> —current and future GTCC LLW and GTCC-like waste would be disposed of at a new IDB facility at the same locations identified in Alternative 4



Proposed Disposal Methods for EIS Analysis

- Deep geologic repository
- Intermediate depth borehole
- Enhanced near surface



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Proposed Disposal Methods (cont'd)

Deep Geologic Repository

- Placement of waste in mined cavities deep beneath the earth's surface
- This method is currently used for disposal of TRU waste at WIPP and is proposed for the disposal of spent nuclear fuel and high-level waste at the proposed Yucca Mountain Repository



Disposal of contact handled TRU waste in geologic repository



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Proposed Disposal Methods (cont'd)

Enhanced Near Surface

- Placement of waste in engineered trenches, vaults, or other similar structures within the upper 30 meters of the earth's surface
- The containment characteristics of these facilities can be enhanced through barriers, deeper disposal, and waste packaging



Concrete disposal vault for LLW at DOE facility



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Proposed Disposal Methods (cont'd)

Intermediate Depth Borehole Disposal

- Placement of waste in an augered borehole deeper than 30 meters beneath the earth's surface
- Additional barriers such as drilling deflectors could provide increased protection against inadvertent human intrusion
- Successfully demonstrated in the U.S. and other countries



Close-up of drilling equipment for borehole construction



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Proposed Disposal Locations for EIS Analysis

- WIPP, NM
- WIPP Vicinity, NM
- Proposed Yucca Mountain Repository, NV
- Idaho National Laboratory (INL), ID
- Los Alamos National Laboratory (LANL), NM
- Nevada Test Site (NTS), NV
- Savannah River Site (SRS), SC
- Oak Ridge Reservation (ORR), TN
- Hanford Site, WA
- EIS will also analyze generic commercial facilities



Additional Disposal Alternative Considerations

- DOE intends to evaluate each of the GTCC waste types individually and in combination for each of the disposal alternatives, taking into consideration waste characteristics, volumes, and generation rates
- The EIS will describe the statutory and regulatory requirements for each alternative and whether legislation or regulatory modifications may be needed to implement the alternative under consideration



GTCC EIS Process

- Advanced Notice of Intent
- Notice of Intent
- Public Scoping Process ← (current stage of EIS)
- Draft EIS
- Public Comment on Draft EIS
- Final EIS
- Report to Congress on Disposal Alternatives
- Record of Decision (following Congressional action on the Report to Congress on disposal alternatives)



Public Participation

- NEPA process provides opportunities for public participation
- You can participate by:
 - Providing oral or written comments tonight on the scope of the EIS including proposed alternatives and environmental issues
 - Written comments may be provided at scoping meetings, by mail, via GTCC EIS website, or by fax by September 21, 2007
- You can continue to stay informed by visiting the GTCC EIS website at <http://www.gtcceis.anl.gov>



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