

# Overview of Waste Management Across the Cleanup Complex

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Doug Tonkay  
Director of Waste Disposal, EM-4.22  
Office of Environmental Management

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- DOE radioactive waste overview
- High-level radioactive waste (HLW)
- Spent nuclear fuel (SNF)
- Transuranic (TRU) waste
- Greater-than-Class C (GTCC) LLW
- Low-level radioactive waste (LLW)
- Packaging and transportation

- Authority for management of all DOE generated waste is under authority of the Atomic Energy Act of 1954 (AEA), as amended.
  - DOE has unique waste streams because of its historic and current missions
  - DOE Order 435.1, *Radioactive Waste Management*, with associated guidance, provides policy and requirements for DOE Waste Management.
- Clear distinction exists between DOE and non-DOE waste in the Low-Level Waste Policy Amendments Act of 1985.
  - States and regional disposal compacts are responsible for disposal of non-DOE and non-naval decommissioning LLW.
  - DOE does not accept LLW/Mixed LLW from non-DOE generators, unless there is a documented DOE nexus or a national security rationale, in accordance with our “eligibility criteria”.

# DOE Radioactive Waste Overview- Responsibilities and Disposition Paths

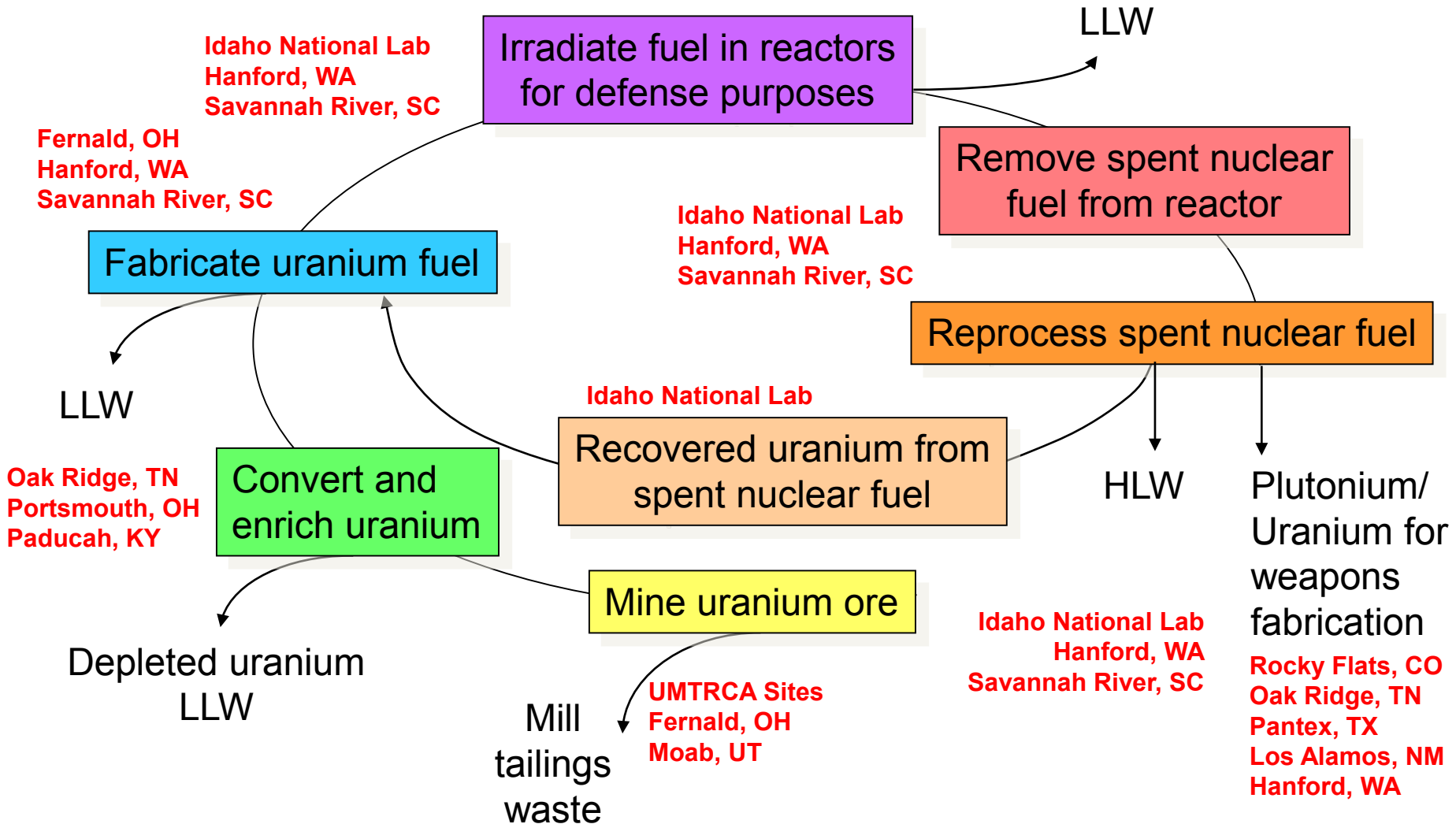
Waste Class	Regulatory Responsibilities	Disposition Path
HLW	<ul style="list-style-type: none"> <li>• DOE for disposal</li> <li>• U.S. Environmental Protection Agency (EPA) disposal standards</li> <li>• NRC licenses</li> </ul>	Geologic repository
GTCC LLW	<ul style="list-style-type: none"> <li>• DOE for disposal</li> <li>• NRC* regulates disposal</li> </ul>	Geologic repository <u>unless</u> proposals for disposal in a disposal site licensed pursuant to 10 CFR 61 are approved by NRC; NRC currently looking at near-surface disposal
TRU Waste	<ul style="list-style-type: none"> <li>• DOE for disposal</li> <li>• EPA certification</li> <li>• New Mexico permit</li> </ul>	WIPP, DOE owned/operated
LLW (NRC has sub-classes)	<ul style="list-style-type: none"> <li>• DOE for DOE disposal facilities</li> <li>• NRC Agreement State for commercial facilities</li> <li>• EPA/State permit if mixed</li> </ul>	DOE or commercial near-surface disposal facilities

 – NRC and DOE definition

 – NRC definition

 – DOE definition \* Subject of current regulatory review

# DOE Radioactive Waste Overview- Origins in the Manhattan Project

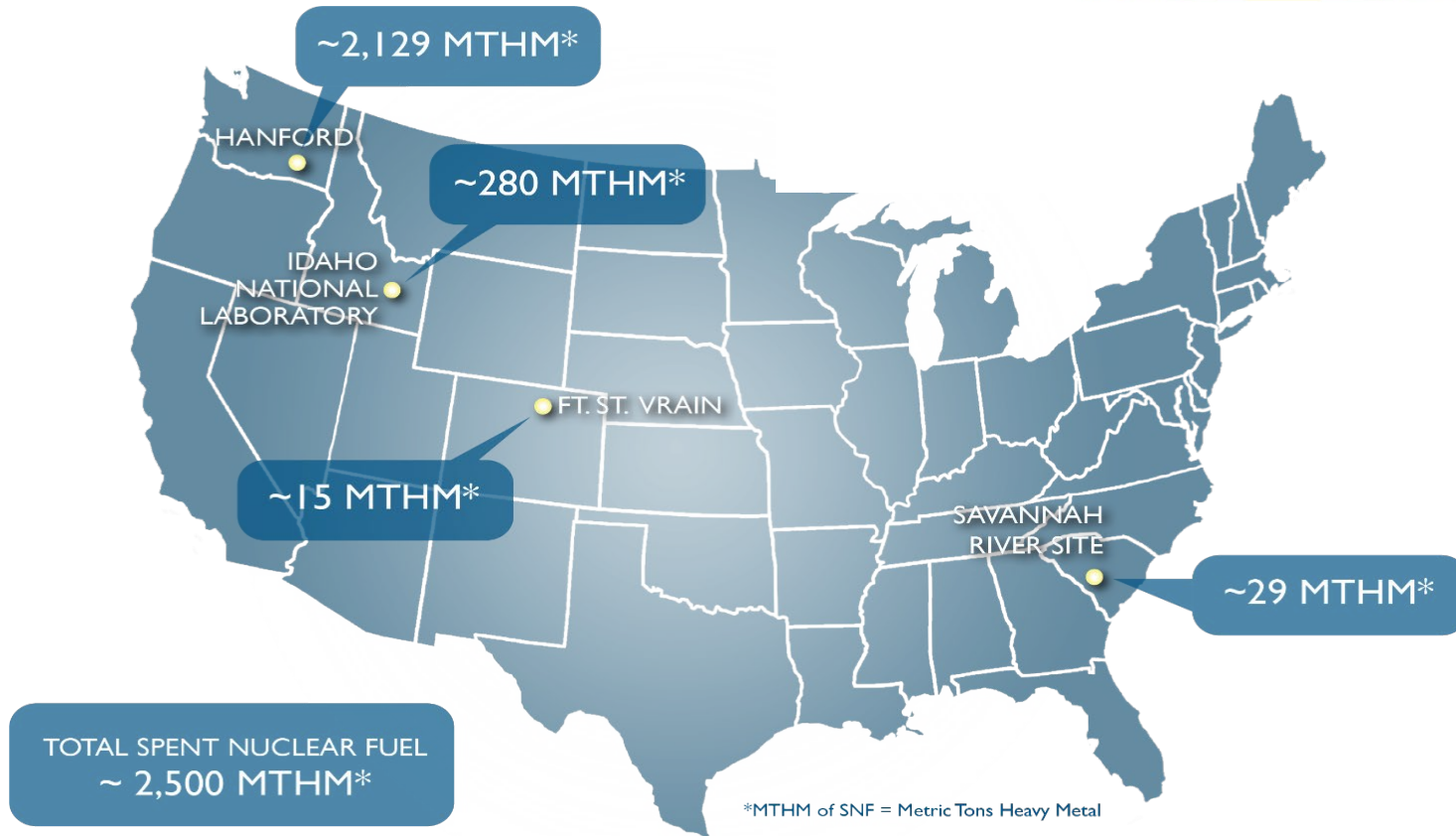


- The AEA and the Nuclear Waste Policy Act of 1982, as amended, define HLW as:
  - (A) the highly radioactive material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and
  - (B) other highly radioactive material that the Commission, consistent with existing law, determines by rule requires permanent isolation.
- Reprocessing waste is managed at the Hanford Site in Washington, Savannah River Site in South Carolina, West Valley Demonstration Project in New York, and Idaho National Laboratory.

- In June 2019, DOE issued its interpretation of the term “high-level radioactive waste,” which will allow some lower activity reprocessing waste to be disposed of in a risk-based manner based on its characteristics, rather than its origin.
  - <https://www.energy.gov/em/high-level-radioactive-waste-hlw-interpretation>
- This science-based approach is expected to enable Department to move forward with its vital cleanup mission in a more effective manner to serve as a strong steward of public resources while still maintaining safety as a top priority.
- DOE will work closely with local officials, regulators, and stakeholders where reprocessing waste is stored and where such waste might be disposed of, before any disposal decisions are made.
- The HLW Interpretation does not change or revise any current policies, legal requirements, or agreements.
- DOE has taken an initial step to examine the use of this interpretation for a single waste stream at the Savannah River Site, in the *Draft Environmental Assessment for the Commercial Disposal of DWPF Recycle Wastewater from the Savannah River Site* (EA) .
  - Public comment period for the Draft EA has been extended to 2/10/2020.

- SNF: Fuel that has been withdrawn from a nuclear reactor following irradiation, the constituent elements of which have not been separated by reprocessing.
  - Material in storage, still has possible programmatic use, can recover valuable constituents.
- DOE is responsible for SNF disposal in deep geologic repository; NRC is responsible for licensing facility.





DOE owned SNF is safely stored at four DOE sites.

- Radioactive waste containing more than 100 nanocuries of alpha-emitting TRU isotopes per gram of waste (100 nCi/g), with half-lives greater than 20 years, except for:
  - (1) HLW;
  - (2) Waste that DOE and EPA agree does not need the degree of isolation required by the 40 CFR Part 191 disposal regulations; or
  - (3) Waste that the NRC has approved for disposal on a case-by-case basis in accordance with 10 CFR Part 61
- Atomic number greater than 92, including neptunium, plutonium, americium, and curium.
- TRU waste must comply with the WIPP Waste Acceptance Criteria.

# Update on TRU Waste Shipments to WIPP

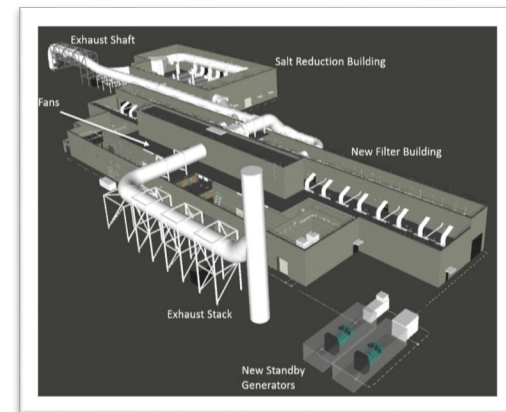
- 292 shipments made in calendar year 2019:
  - Idaho National Laboratory (227)
  - Oak Ridge National Laboratory (29)
  - Los Alamos National Laboratory (27)
  - Savannah River Site (5)
  - Waste Control Specialists (2)
  - Argonne National Laboratory (2)
  
- 350 shipments are expected from February 2020-January 2021:
  - Idaho National Laboratory
  - Oak Ridge National Laboratory
  - Los Alamos National Laboratory
  - Savannah River Site
  - Argonne National Laboratory
  - Lawrence Livermore National Laboratory



Over 12,000 shipments total have been made to WIPP, with more than 15 million loaded miles safely completed.

## Update on TRU Waste Shipments to WIPP (cont'd)

- Current projects will lead to an increase in emplacement rates in 2021-2022 timeframe:
  - Availability of Panel 8, which is now being mined, will return emplacement to uncontaminated areas and allow more efficient operations.
  - Increased ventilation (with a new utility shaft and filter building) will support additional personnel and equipment underground, allowing expansion of work.
- Updated TRU waste inventory available. See: [https://wipp.energy.gov/Library/TRUwaste/DOE-TRU-19-3425\\_R0\\_FINAL.pdf](https://wipp.energy.gov/Library/TRUwaste/DOE-TRU-19-3425_R0_FINAL.pdf)



- In October 2018, EM issued the *Environmental Assessment for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste at Waste Control Specialists, Andrews County, Texas*.
  - The Environmental Assessment provides a site-specific analysis of the potential environmental impacts of disposing the entire inventory- 12,000 cubic meters- of GTCC LLW and GTCC-like waste at Waste Control Specialists, LLC (WCS) in Andrews, Texas.
  - DOE issued this Environmental Assessment because the 2016 *Final Environmental Impact Statement for the Disposal of Greater-Than-Class C (GTCC) Low-Level Radioactive Waste and GTCC-Like Waste* did not specify a particular commercial facility in its preferred alternative of generic commercial facilities and/or the Waste Isolation Pilot Plant).
- This Environmental Assessment is part of the National Environmental Policy Act of 1969 process and does not constitute a decision on the disposal of GTCC LLW and GTCC-like waste.

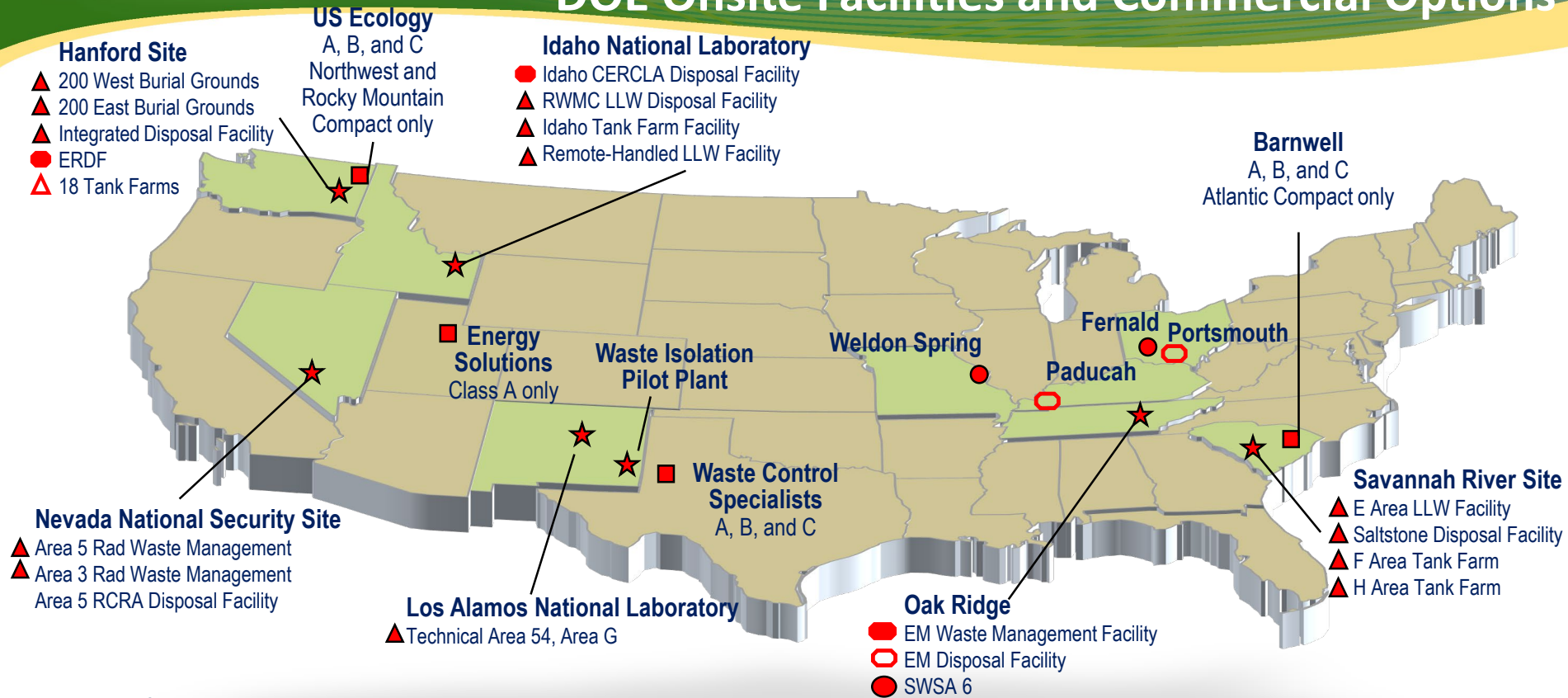
- DOE continues to coordinate with Congress regarding the intent of “await action by Congress” as noted in Section 631(b)(1)(B)(ii) of the Energy Policy Act of 2005.
- In June 2019, Nuclear Regulatory Commission’s (NRC) issuance of the Draft Regulatory Basis for GTCC LLW disposal.
  - NRC issued its Draft Regulatory Basis for public comment in 2019. DOE provided comments to NRC.
  - The Final Regulatory Basis is anticipated to address suitability of near-surface disposal and whether an Agreement State can regulate the disposal of GTCC LLW.
- Timeframe for a Record of Decision on GTCC LLW and GTCC-like waste disposal is TBD.

- Radioactive waste that is **NOT**:
  - HLW, SNF, TRU waste
  - By-product material
  - Naturally-occurring radioactive material (NORM)
- Examples of LLW (physical forms):
  - Soil, personal protective equipment (PPE), metal, tools, contaminated items, construction debris, sealed sources
- It can be: highly radioactive, hazardous (RCRA or TSCA), or classified

- DOE Order 435.1 defines policy and allows DOE sites to use on-site and off-site disposal paths, as well as commercial treatment and disposal facilities. DOE sites perform analysis of options and make decisions.
- Must meet site-specific waste acceptance criteria for both DOE and Commercial disposal facilities. Commercial facilities provide crucial treatment and disposal support to EM's cleanup mission.
- DOE closely monitors potential changes in the commercial market – treatment waste volumes remain considerably lower since legacy wastes are largely gone.



# DOE Onsite Facilities and Commercial Options



## Facilities

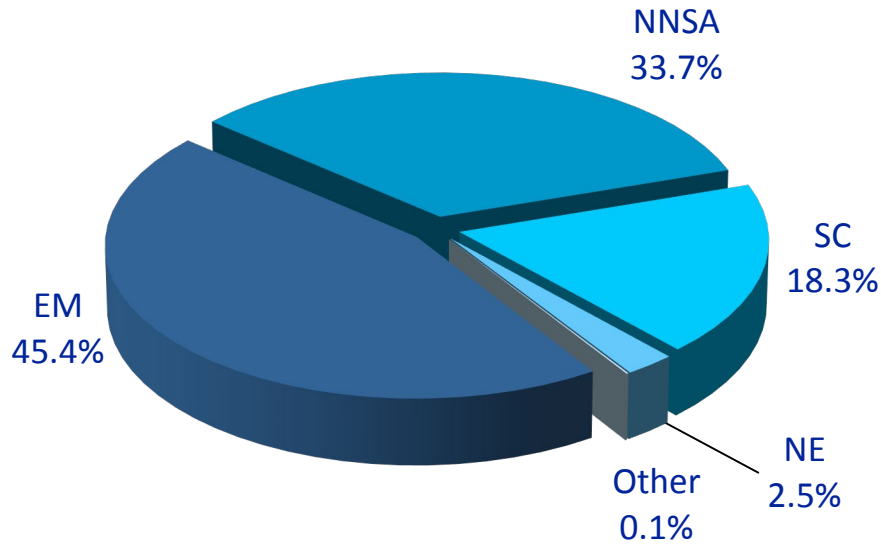
- Existing CERCLA Disposal Facility \*
- Proposed CERCLA Disposal Facility
- ▲ LLW Operations Disposal Facility/Tank Farm Closure
- ▲ Proposed LLW Disposal Facility/Tank Farm Closure
- Closed Disposal Facility
- Commercial LLW Disposal Facility

\*Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)

<https://www.epa.gov/superfund/superfund-cercla-overview>

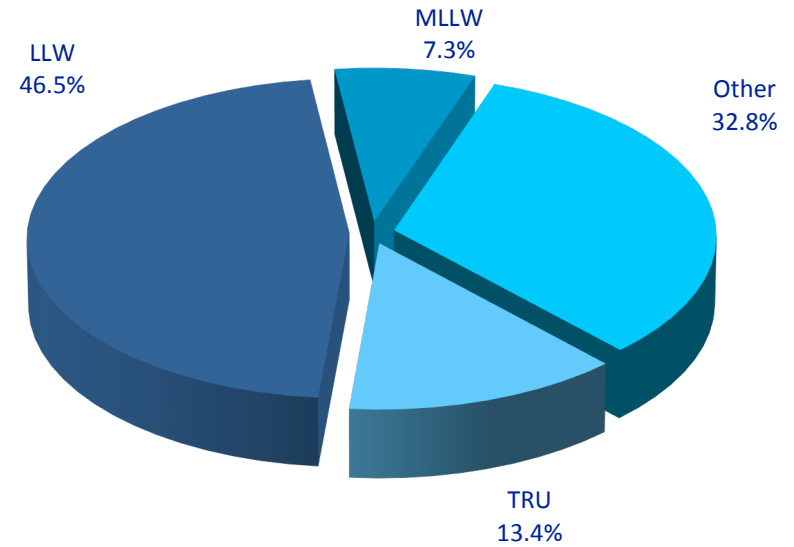


### By Program



EM	2,125
NE	115
SC	856
NNSA	1,578
Other	6
<b>Total</b>	<b>4,680</b>

### By Type of Material



LLW	732
MLLW	115
TRU	210
Other	516

- Compliance and Safety
  - Motor Carrier Evaluation Program (MCEP)
  - Transportation Compliance Reviews at DOE sites
- Packaging Certification Program
- Stakeholder Engagement and Training
  - Transportation Emergency Preparedness Program (TEPP)
  - National Transportation Stakeholders Forum (NTSF)
- Transportation Planning and Management Tools
  - ATLAS, RADCALC, webTRAGIS
- Field support
  - Program support for site transportation managers
  - Transportation Management Council; Packaging Management Council
- Policy and regulatory support
  - DOE Orders; engagement with NRC, DOT, and other federal agencies

