



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
**ENVIRONMENTAL
MANAGEMENT**

Office of Environmental Management Waste Management Overview

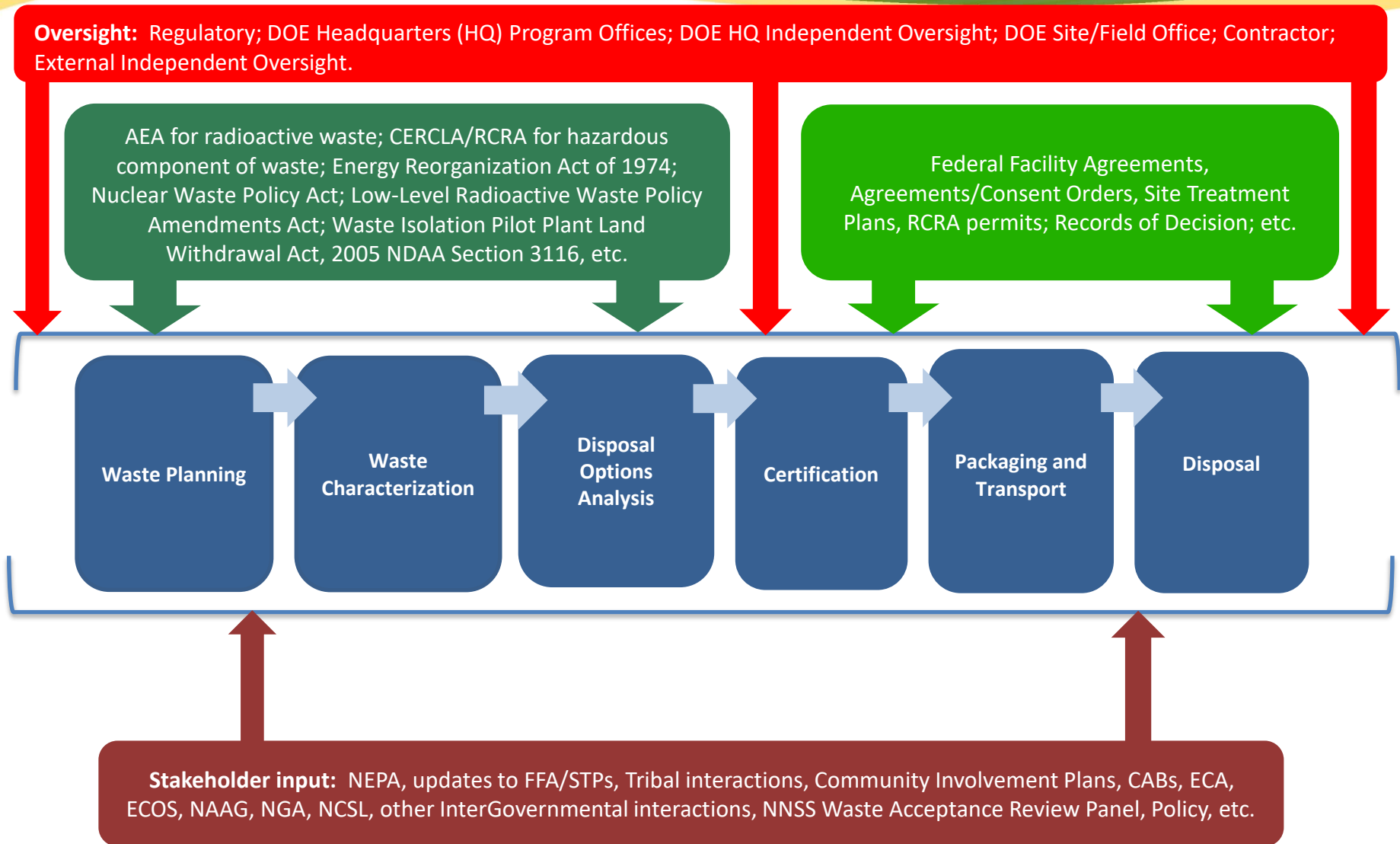
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**Deputy Assistant Secretary for Waste &
Materials Management, EM-4.2**

November 17, 2020

- Waste Definitions and Responsibility
- Waste Disposition Process Overview
- Oversight
- Major Requirements
- Stakeholder Input
- Waste Disposition Process
- Waste Isolation Pilot Plant (WIPP) Update
- High-level radioactive waste (HLW) Interpretation
- Conclusion

Waste Class	Regulatory Responsibilities	Disposition Path
<p>HLW: (A) highly radioactive waste material resulting from the reprocessing of spent nuclear fuel (SNF), including liquid waste produced directly in reprocessing and any solid materials derived from such liquid waste that contains fission products in sufficient concentrations; and (B) other highly radioactive material that the DOE determines requires permanent isolation.</p>	<ul style="list-style-type: none"> • DOE for disposal • U.S. Environmental Protection Agency (EPA) disposal standards • NRC licensing 	<p>Geologic repository</p>
<p>Transuranic (TRU) Waste: Waste containing more than 100 nanocuries (nCi/g) of alpha-emitting transuranic isotopes per gram of waste, with half-lives greater than 20 years.</p>	<ul style="list-style-type: none"> • DOE for disposal • EPA certification • New Mexico permit 	<p>WIPP, defense TRU waste only</p>
<p>LLW: Radioactive waste that is <u>NOT</u>: HLW, SNF, TRU waste, byproduct material or naturally occurring radioactive material (NORM).</p> <p>Mixed LLW: Radioactive waste with a hazardous component regulated under the Resource, Conservation and Recovery Act.</p>	<ul style="list-style-type: none"> • DOE for disposal of DOE owned LLW • NRC Agreement State for commercial facilities • EPA/State permit if mixed 	<p>DOE or commercial near-surface disposal facilities</p>
<p>Greater-than-Class C (GTCC) LLW</p>	<ul style="list-style-type: none"> • DOE for disposal • NRC regulates disposal 	<p>Geologic repository unless proposals for disposal in a disposal site licensed pursuant to 10 CFR 61 are approved by NRC; NRC currently looking at near-surface disposal.</p> <p>Environmental Impact Statement is complete by DOE.</p>

Example of the Waste Disposition Process



- **Atomic Energy Act (AEA):** Authorizes DOE to regulate possession, use and safe disposal of radioactive materials. This authority is implemented through the DOE directives system (e.g., DOE Order 435.1, *Radioactive Waste Management*).
- **Resource Conservation and Recovery Act (RCRA)/Industrial Wastewater (IWW) Permits:** Gives EPA/States the authority to control hazardous waste from the "cradle-to-grave," e.g., generation, transportation, treatment, storage, and disposal of hazardous waste.
- **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA):** Provides broad Federal authority to respond directly to releases or threatened releases of hazardous substances that may endanger public health or the environment.
- **Other Agreements:** 1995 Idaho Settlement Agreement; 2016 New Mexico Environment Department Compliance Order on Consent; NDEP participation in the Nevada National Security Site Waste Acceptance Review Panel, etc.



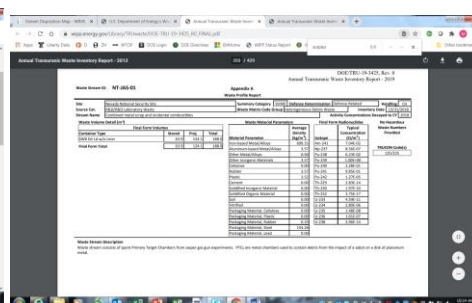
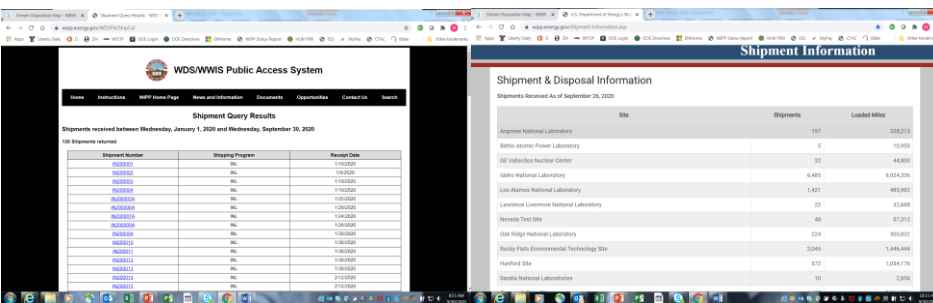
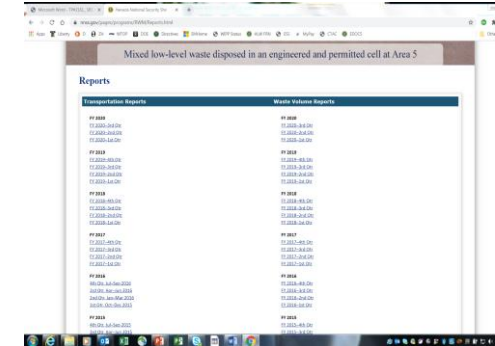
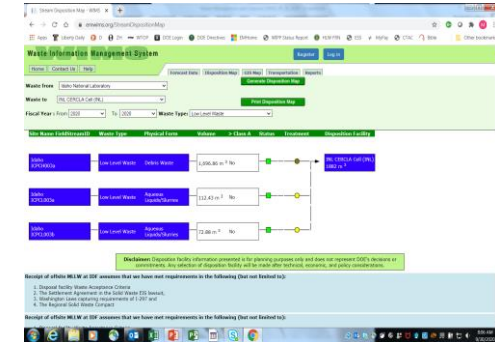
- **Regulatory**
 - Hazardous components: State and EPA (RCRA/IWW, CERCLA); DOT for transportation.
 - NRC, Agreement States for commercial disposal facilities.
- **Contractor**
 - Contactor Assurance System.
- **DOE Site/Field Office**
 - Assess contactor performance.
 - Approves Radioactive Waste Management Basis (systematic approach for planning, executing, and evaluating the management of radioactive waste; ensures that waste management activities are compliant) and special analyses.
- **DOE HQ Program Offices**
 - Assess DOE Site/Field Office performance and oversight functions.
 - DOE Order 435.1 periodic reviews.
- **DOE HQ Independent Oversight**
 - Office of Environmental Health, Safety and Security.
 - Office of Enterprise Assessment.
 - Low-Level Waste Disposal Facility Federal Review Group, APDAS approval of Disposal Authorization Statement for on-site disposal facilities (permit).
- **External Independent Oversight**
 - DNFSB, Government Accountability Office, DOE Inspector General, etc.



Opportunities	Description
Documents for Public Review and Comment	<ul style="list-style-type: none"> EM/Field Offices will provide opportunities for review and comment on documents as required by established regulatory and programmatic processes, e.g., RCRA/IWW, CERCLA, NEPA, waste incidental to reprocessing evaluations (e.g., Vitrified Low Activity Waste), Section 3116 of 2005 NDAA. These opportunities are posted on the respective site websites.
Public Meetings	<ul style="list-style-type: none"> Periodic public meetings to discuss activities; notification on websites, electronic notifications and paid advertising. Public involvement calendars, e.g., https://www.hanford.gov/page.cfm?page=463 and https://www.hanford.gov/files.cfm/TPA_PI_Calendar_4_1_19.pdf.
Internet Website/Social Media	<ul style="list-style-type: none"> Relevant information, documents and site-specific information, e.g., announcing meetings and opportunities for public involvement, as well as providing pertinent technical, programmatic and regulatory documents.
Site-Specific Advisory Boards (SSAB)	<ul style="list-style-type: none"> SSABs have played a key role in building strong public participation programs. At all sites, regardless of their original formation and goals, the boards have become the focus of public participation and a principal mechanism for providing information and opportunities for informed involvement.
News Releases and Community Advisories	<ul style="list-style-type: none"> Field Offices will issue news releases or community advisories as appropriate. These news releases or advisories are distributed to news media and other engaged stakeholders.
Independent Advocacy Groups (ECA, ECOS, NAAG, NGA, NCSL, STGWG)	<ul style="list-style-type: none"> Encourage open, amicable and trusting relationships with its governmental colleagues at the state, local and tribal level in order to better carry out its mission, and enhance collaboration and cooperation.
Government-to-Government interactions with Native American Tribes	<ul style="list-style-type: none"> Interaction and consultation with federally recognized tribes affected by DOE activities and operations.
Publications	<ul style="list-style-type: none"> EM HQ/Field Offices will prepare fact sheets and other informational documents and typically available on site's webpage(s).
Speakers Bureau	<ul style="list-style-type: none"> Field Office representative or designee will give presentations on implementation as requested.
Site Tours	<ul style="list-style-type: none"> Field Offices conduct stakeholder and media tours as a part of their normal public interaction process.



- Life-cycle planning: Determine generation, treatment, storage, transfer and disposal management needs prior to project start.
- Risk/cost benefit studies.
- Site Priorities – Budget and Integrated Priority List.
- Planning Tools:
 - LLW
 - Disposition maps – forecast data for planning purposes: <https://emwims.org/StreamDispositionMap>
 - NNS waste volume/transportation reports: <https://www.nnss.gov/pages/programs/RWM/Reports.html>
 - Defense TRU Waste
 - Shipment information: <https://www.wipp.energy.gov/shipment-information.asp>
 - Waste Data System: <https://www.wipp.energy.gov/WDSA/Home>
 - Annual TRU Waste Inventory Report, DOE/TRU-19-3425: https://wipp.energy.gov/Library/TRUwaste/DOE-TRU-19-3425_RO_FINAL.pdf



- Sampling, non-destructive assay
- Process and acceptable knowledge
- Know how your data will be used
- Oversight audits
- Physical/chemical, volume, weight, radiological concentrations
- Defense TRU waste:
 - Defense determination required
 - Central Characterization Project provides characterization assistance at the generator sites



OFFICE OF ENVIRONMENTAL MANAGEMENT Notional Waste Disposition Process



- The vast majority (80-90%) of EM's LLW/MLLW are disposed at DOE's onsite facilities.
- DOE's policy is to dispose of LLW/MLLW onsite, if practical. When onsite disposal is not available, disposal at another DOE facility is used or a commercial facility that is compliant, cost-effective and is in the best interest of the government.
- Options Analysis Process:
 - Based on waste type, defined by sampling/characterization, what are the options available?
 - Engage onsite and offsite waste services representative.
 - Alternatives Analysis Considerations:
 - Waste characterization and associated documentation.
 - Waste acceptance criteria (WAC), e.g., stabilization/treatment requirements.
 - Packaging needs.
 - Transportation to the disposal site.
 - Protection of public health and the environment.
 - Cost-effectiveness.
 - Other pertinent factors.
- Site makes decision based on best interest to the Government.



- Verify the waste meets receiving facilities' waste acceptance criteria and license.
- Ensure appropriate records management.
- Quality Assurance requirements must be met.
- Compliance with disposal site waste acceptance procedures:
 - Inspections/reviews.
 - Packaging.
 - Documented in waste profile (origin, quantity, composition, packaging, analytical methods used in characterization, etc.).



- Load management.
- Disposal site reviews/accepts waste manifest.
- Receiving facility must authorize waste transfer.
- Inspections.
- Tracking of TRU waste.
- Minimize volume and number of shipments.
- Oversight audits.
- Transport to WIPP must be in NRC approved package.

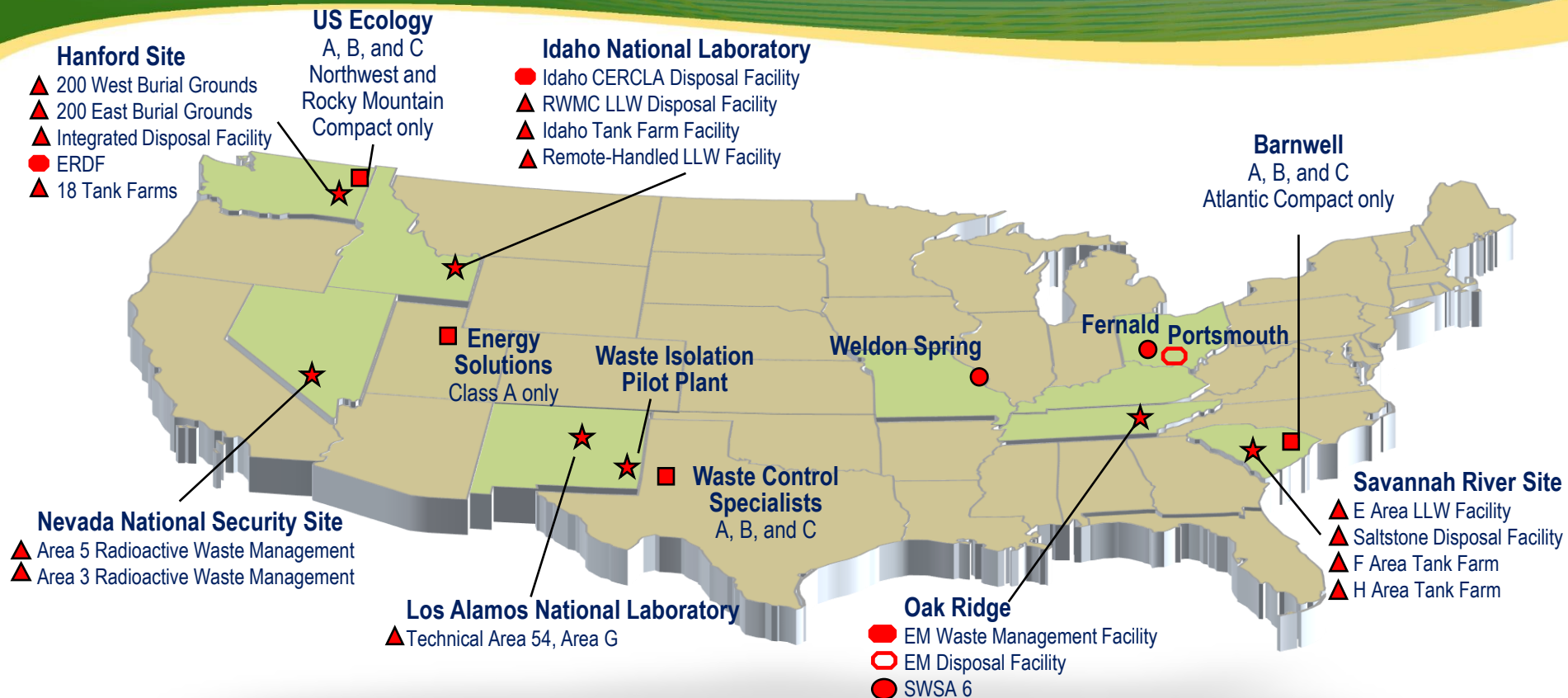


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Notional Waste Disposition Process



Disposal: DOE & Commercial Disposal Facilities



Facilities

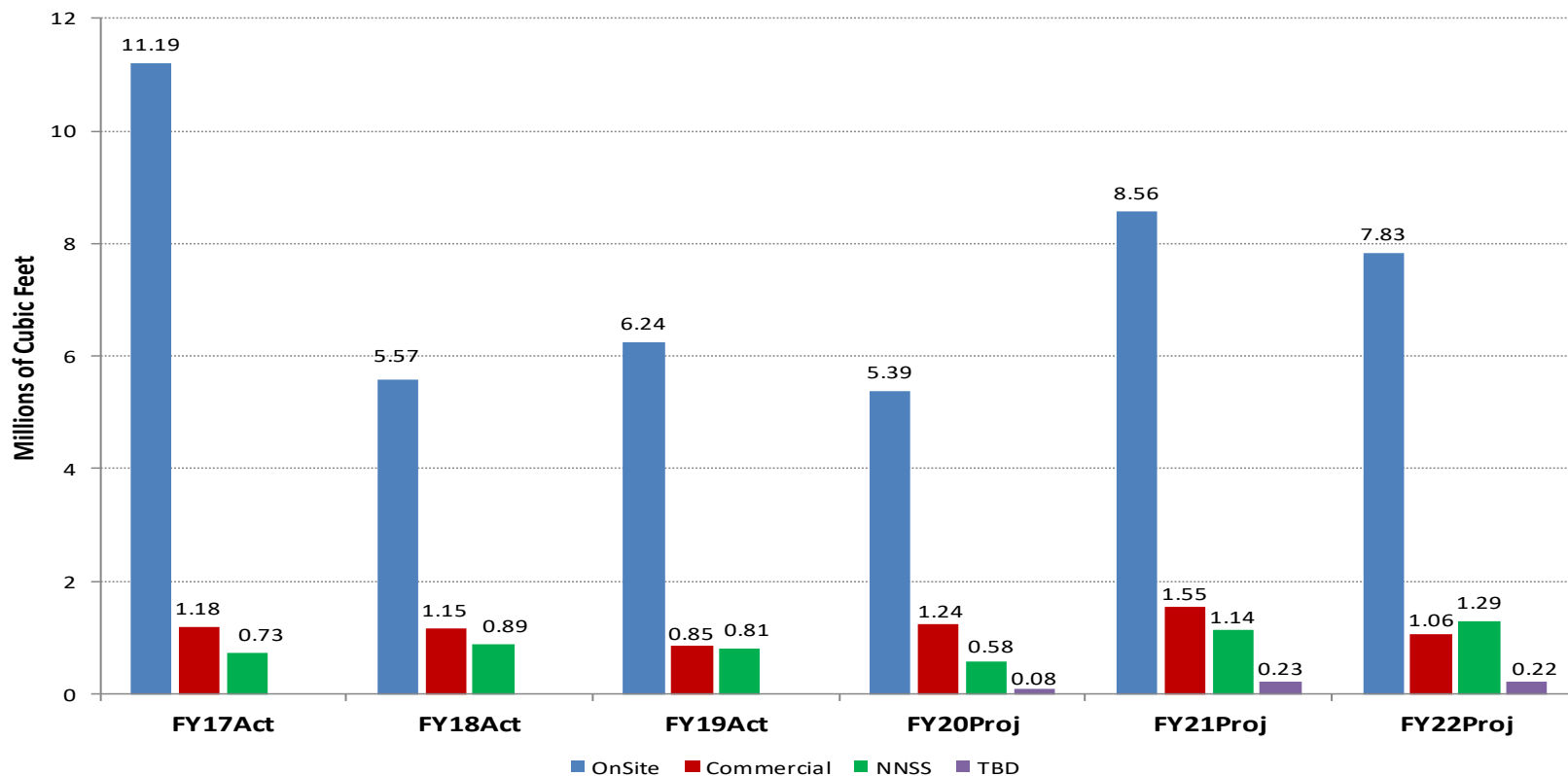
- Existing CERCLA Disposal Facility *
- Proposed CERCLA Disposal Facility
- ▲ LLW Operations Disposal Facility/Tank Farm Closure
- Closed Disposal Facility
- Commercial LLW Disposal Facility

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

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

OFFICE OF ENVIRONMENTAL MANAGEMENT National Waste Disposition Process





*Based upon data currently compiled in EM WIMS

Notional Waste Disposition Process



- WIPP has been disposing of DOE defense-related TRU waste since 1999.
- Over 12,700 shipments total have been made to WIPP, with more than 15.2 million loaded miles safely completed.
- Approximately 180 shipments were made in fiscal year 2020.
- New projects are ongoing to increase ventilation. Will support additional personnel and equipment underground, allowing additional panels.
- The WIPP TRU waste inventory estimates are updated on an annual basis (Annual Transuranic Waste Inventory Report 2019, DOE/TRU-19-3425).
- Compliance with the volume capacity limit is closely tracked to ensure WIPP meets its intended mission.
- DOE expects having adequate capacity within the WIPP Land Withdrawal Act volume capacity limit to accept all TRU waste currently intended for disposal at WIPP, taking into account typical uncertainties:
 - Estimates change several percentage points up or down every year.
 - DOE gets more efficient in the way we manage the TRU volumes, e.g., packaging.
 - Historically, a good portion of what DOE thought would be TRU waste, falls out as MLLW.
 - In many cases we use bounding volumes, e.g., in NEPA, that come out to be lower than anticipated.
- In summary, we will continue to monitor closely and adjust as needed.



HLW Interpretation

- In June 2019, EM issued its interpretation of the statutory term HLW.
- The interpretation allows waste to be classified and disposed according to its radiological characteristics (risk-based), not its origin (source-based), consistent with international standards.
- In August 2020, EM issued the Final Environmental Assessment and Finding of No Significant Impact for Savannah River Site (SRS) Defense Waste Processing Facility (DWPF) recycle wastewater disposal at a LLW commercial facility outside of South Carolina.
- In September 2020, EM completed shipments of 8 gallons of SRS DWPF recycle wastewater to Waste Control Specialists LLC (WCS) in Texas.
 - WCS will stabilize (grout) and dispose of the waste at its Federal Waste Facility in the next few months.
- For additional information please visit: <https://www.energy.gov/em/program-scope/high-level-radioactive-waste-hlw-interpretation>
- In FY 2021, DOE will be evaluating next steps.



Photo: A truck transporting a portion of the 8 gallons of DWPF recycle wastewater.

- DOE waste management oversight is rigorous.
- Statutory and regulatory requirements are well established.
- Multiple opportunities for stakeholder input.
- Waste disposition process is comprehensive from cradle to grave.

