U.S. DEPARTMENT OF ENERGY

Update on Environmental Management

Alice Williams
Associate Principal Deputy Assistant Secretary
Office of Environmental Management

National Transportation Stakeholders Forum

MAY 16, 2012
KNOXVILLE, TN

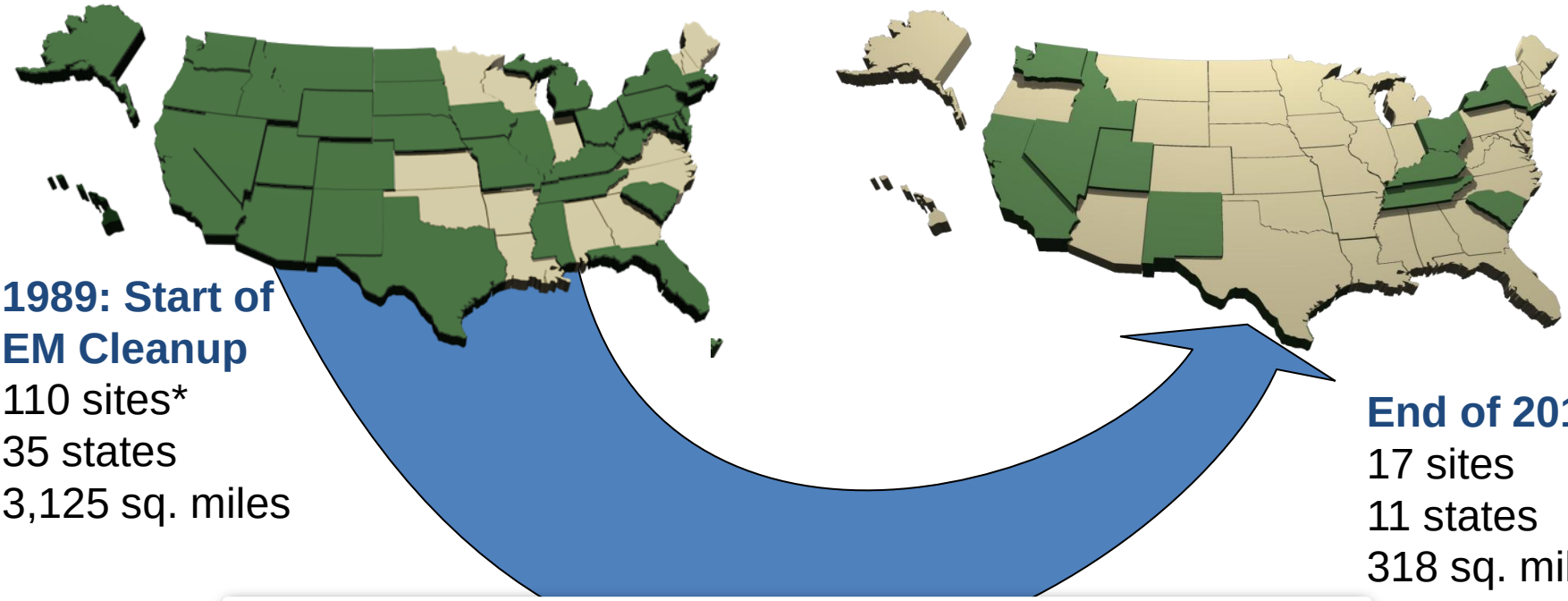
EM Mission

"Complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development, production, and Government-sponsored nuclear energy research"

- From a legacy of weapons production to the world's largest environmental cleanup program
- Operating in the world's most complex regulatory environment
- EM cleanup enables DOE to maintain ongoing operations and other critical missions (NNSA/SC) while achieving compliance with governing environmental laws

EM Environmental Management

Progress to Date and Challenges Ahead



1989: Start of EM Cleanup
110 sites*
35 states
3,125 sq. miles

End of 2011
17 sites
11 states
318 sq. miles

- The program's toughest challenges are still ahead, including processing liquid tank waste and deactivating and decommissioning a large number of facilities.
- These challenges require innovative technical solutions and scientific approaches.

EM Organization

Senior Advisor for Environmental Management: D. Huizenga*
Principal Deputy Assistant Secretary: T. Mustin

Chief of Staff: C. Trummell
Chief Scientist: M. Neu

Office of External Affairs :
- Communications: C. Jones*
- Intergovernmental & Community Activities: M. Nielson

Associate Principal Deputy Assistant Secretary: A. Williams (EM-2.1)
Senior Advisor: Y. Collazo
International Program

SRS	RL	ORP	PPPO	CBFO	ID	OR	CBC (Small Sites)
D. Moody	*M. McCormick*	*S. Samuelson*	*W. Murphie*	*J. Franco*	*J. Cooper*	*S. Cange (Acting)*	*J. Craig*

Savannah River National Laboratory

MISSION UNITS

EM-10
Site Restoration
(M. Gilbertson/W. Levitan)
- EM-11 Environmental Compliance
- EM-12 Soil/GW Remediation
- EM-13 D&D and Facility Engineering

EM-20
Tank Waste & Nuclear Material
(K. Picha*/J. Rhoderick)
- EM-21 Tank Waste Management
- EM-22 Nuclear Material Disposition
- EM-23 WTP /Tank Farm Program

EM-30
Waste Management
(F. Marcinowski/C. Gelles)
- EM-31 Disposal Operations
- EM-32 Disposition Planning & Policy
- EM-33 Packaging & Transportation

MISSION SUPPORT

EM-40
Safety, Security, & Quality Programs
(M. Moury/J. Hutton*)
- EM-41 Safety Management
- EM-42 Operational Safety
- EM-43 Standards & Quality Assurance
- EM-44 Safeguards, Security & Emergency Preparedness

EM-50
Acquisition & Project Management
(J. Surash/TBD)
- EM-51 Procurement Planning
- EM-52 Contract Assistance
- EM-53 Project Assessment
- EM-54 Recovery Act Program

EM-60
Program Planning & Budget
(T. Tyborowski*/TBD)
- EM-61 Budget
- EM-62 Strategic Planning and Analysis
- EM-63 Management Systems & Analysis

EM-70
Human Capital & Corporate Services
(S. Waisley/TBD)
- EM-71 Human Capital
- EM-72 Corporate IT
- EM-73 Business Services

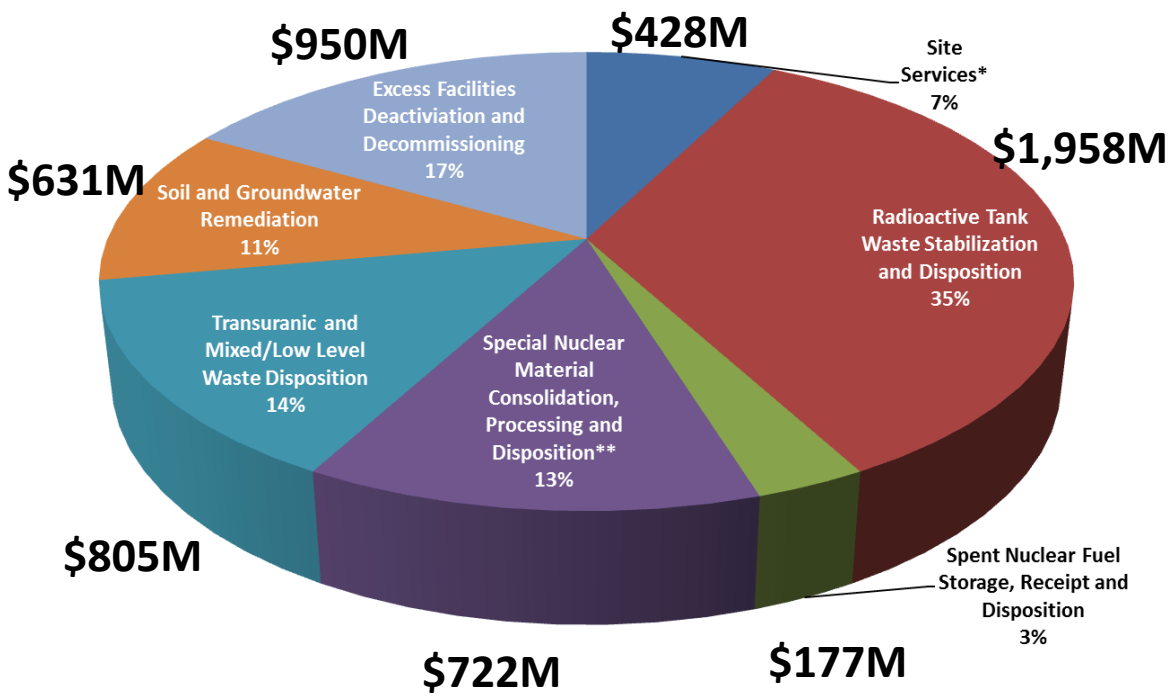
Name/Name = DAS/ADAS
* Acting and TBD (positions to be competed)

EM Program Priorities & FY 2013 Budget

Maintain a safe, secure, and compliant posture in the EM complex

- Radioactive tank waste stabilization, treatment, and disposal
- Spent (used) nuclear fuel storage, receipt, and disposition
- Special nuclear material consolidation, processing, and disposition
- Transuranic and mixed/low-level waste disposition
- Soil and groundwater remediation
- Excess facilities deactivation and decommissioning (D&D)

FY 2013 Budget Request - $5.65B



* Includes Program Direction, Program Support, TDD, Post Closure Administration and Community and Regulatory Support

** Includes Safeguards and Security

FY 2013 budget supports major cleanup accomplishments in all areas of EM's cleanup mission

Across the Complex

- **Tank Waste**: Close Two High Level Waste Tanks
- **Nuclear Materials:** Package over 20,000 metric tons of depleted and other uranium
- **Soil and Groundwater:** Complete remediation on over 100 release sites
- **Solid Waste:** Disposition over 9,000 cubic meters of transuranic waste from inventory
- **Excess Facilities:** Deactivate and decommission over 75 facilities

Installation of a groundwater treatment system at the Hanford site

At Individual EM Sites

- **Hanford – Richland (WA)**: Complete removal and/or remedial actions for thirteen high risk facilities in the site's 300 Area
- **Hanford – River Protection (WA):** Continue construction of Waste Treatment Plant and perform critical tank farm infrastructure upgrades
- **Idaho (ID)**: Complete treatment of all 900,000 gallons of liquid tank waste
- **Los Alamos (NM)**: Complete disposal of 1,800 cubic meters of above-ground transuranic waste
- **Moab (UT):** Dispose of nearly 650,000 tons of radioactive mill tailings
- **Oak Ridge (TN)**: Perform facility deactivation and decommissioning in support of the planned 2015 completion of the K-25 facility
- **Paducah/Portsmouth (KY/OH)**: Continue deactivation and decommissioning of facilities and systems
- **Savannah River (SC)**: Complete disposition of the site's contact-handled legacy transuranic waste

H Canyon and HB Line

Disposition of Non-MOXable Pu to WIPP

- Using one of the existing glovebox lines and ventilation system in HB-Line
- Blend the plutonium oxide with inert material to meet the WIPP WAC and terminate safeguards
- Prepared 33 Pipe Overpack Containers in FY11 and over 250 in FY12
- Plan to make at least one shipment to WIPP in FY12

- Nation's only large-scale shielded nuclear chemical separations plant in operation in the U.S
- Down-blended enriched uranium and provided low enriched uranium to the Tennessee Valley Authority for use in power reactors to generate electricity
- Preparing H Canyon and HB-Line to begin processing plutonium materials in FY13 as feed for Mixed Oxide Fuel Fabrication Facility
- Preparing to process "vulnerable" aluminum-clad SNF for disposition

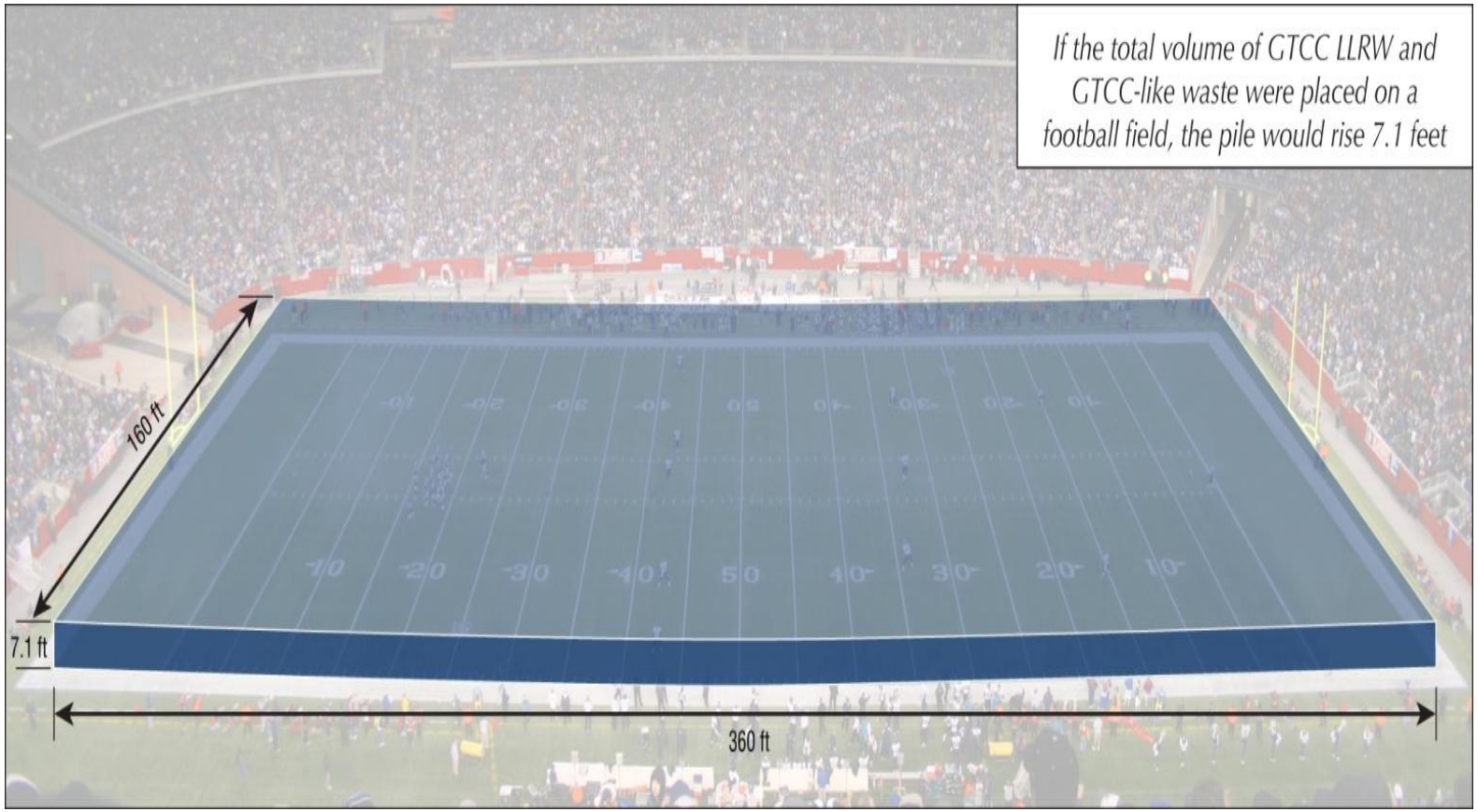
Draft GTCC EIS

- On February 25, 2011, DOE issued Draft Greater Than Class C Environmental Impact Statement (GTCC EIS)
- Evaluated 11 environmental resource areas and potential cumulative impacts
- Potential impacts analyzed for construction, operations, and post-closure phases
- EIS describes models, input parameters, key assumptions, and uncertainties

Resource Areas Evaluated in Draft EIS

1. Climate, Air Quality, and Noise
2. Geology and Soils
3. Water Resources
4. Human Health
5. Ecology
6. Socioeconomics
7. Environmental Justice
8. Land Use
9. Transportation
10. Cultural Resources
11. Waste Management

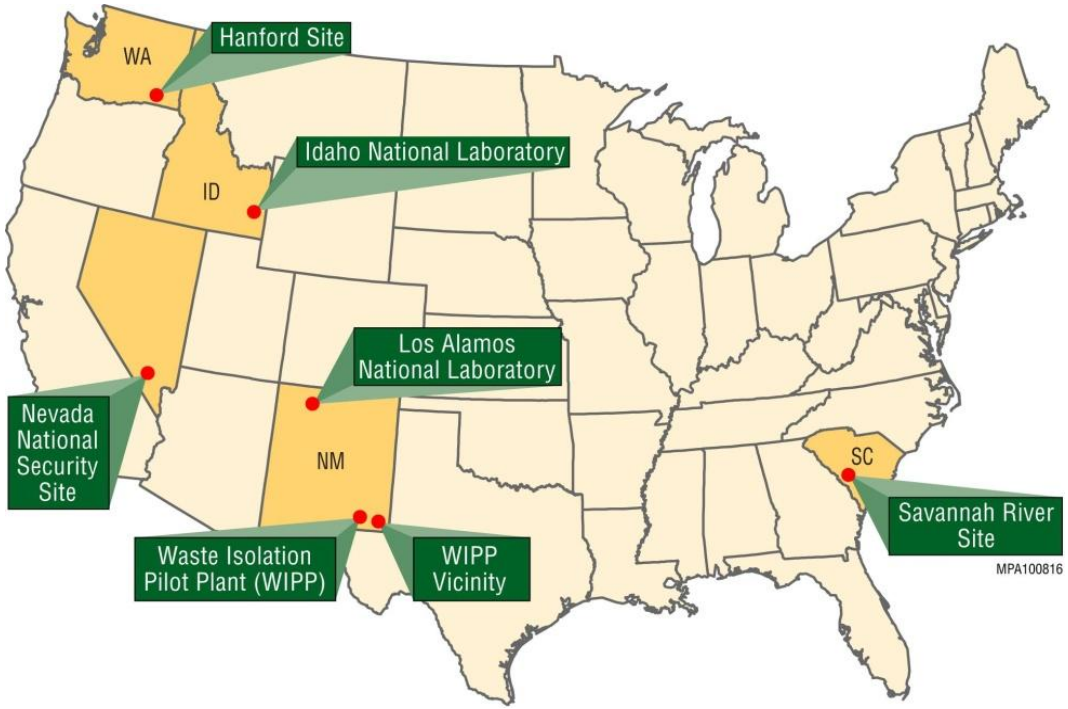
What does 12,000 m^3 look like?



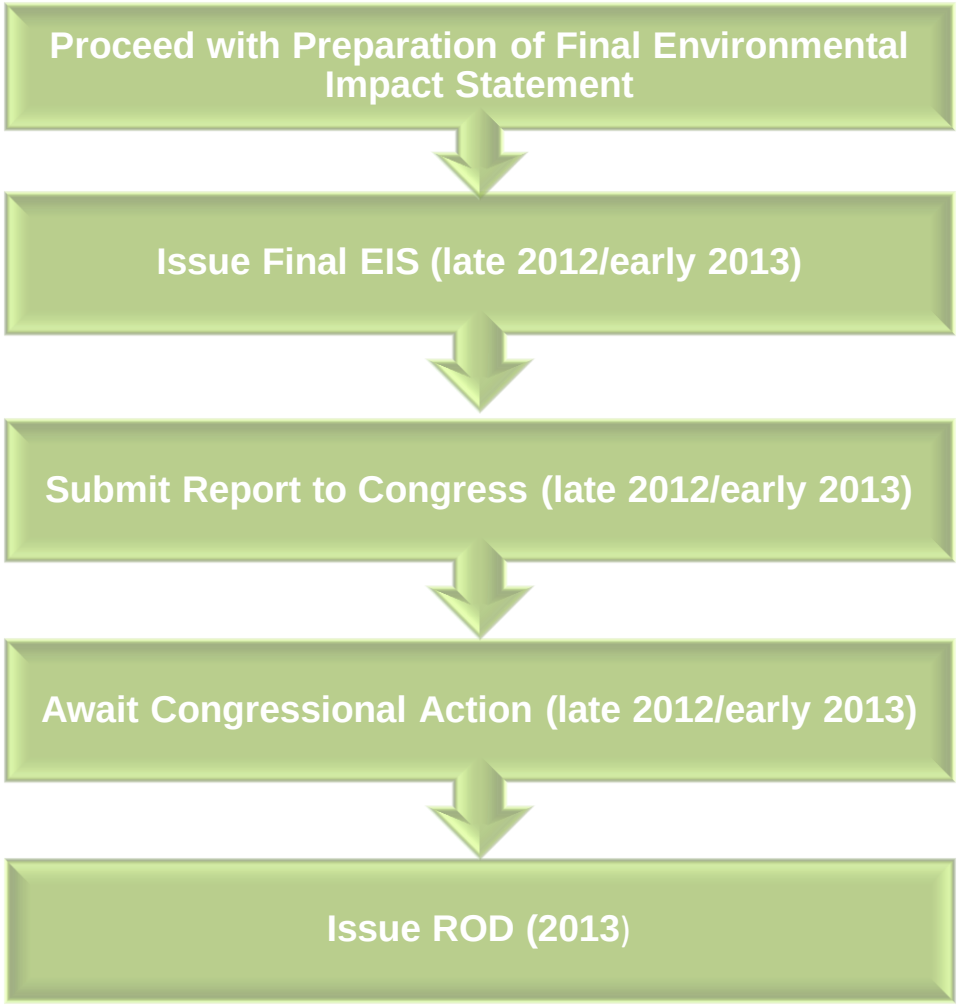
By comparison, ~7,000 m^3 of TRU waste is *annually* disposed of at WIPP and ~28,000 to 56,000 m^3 of LLRW is *annually* disposed of at the Nevada National Security Site (formerly known as Nevada Test Site)

Proposed Disposal Sites

- Six DOE sites with existing radioactive waste disposal operations and federally-owned land in the WIPP Vicinity
- Generic commercial facilities in four NRC regions across the U.S. (Region I-Northeast, Region II-Southeast, Region III-Midwest, and Region IV-West)

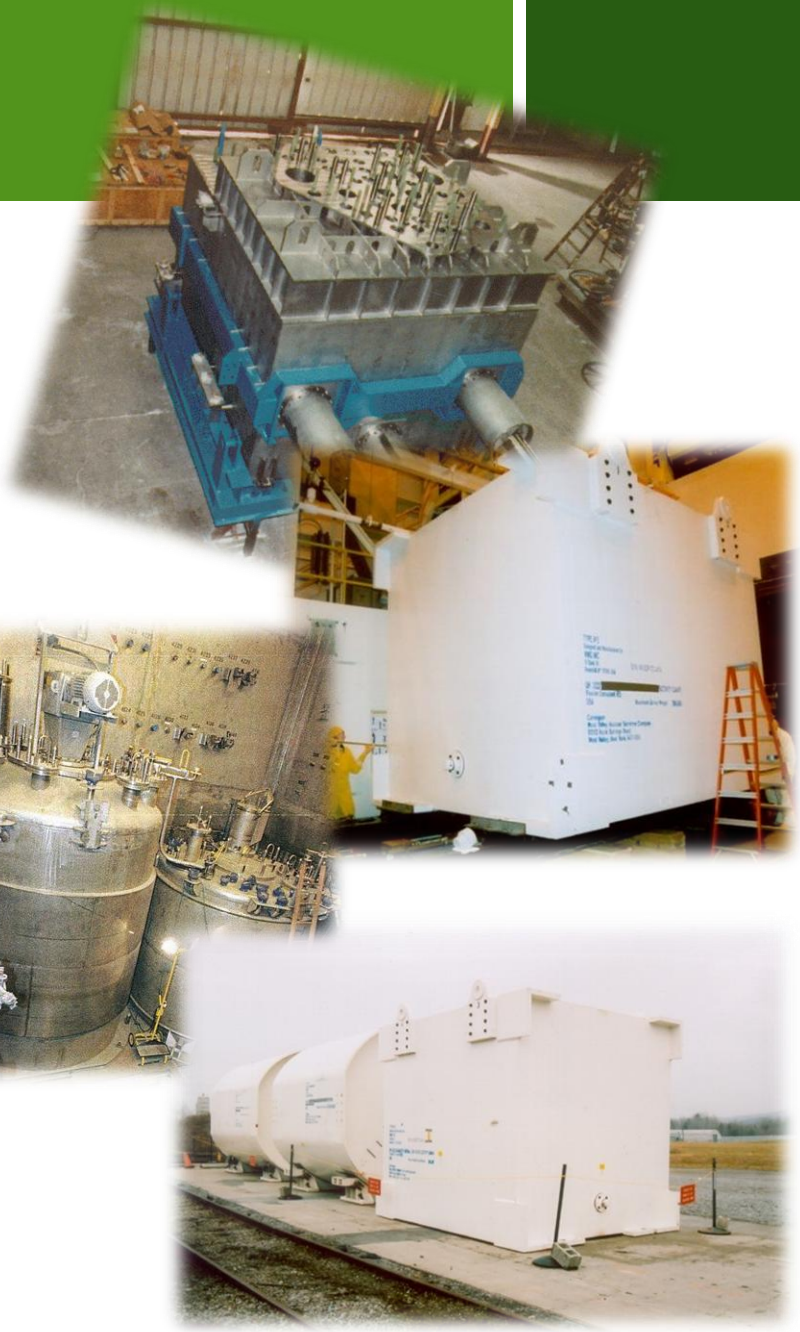


EIS Greater-than-Class C LLW Disposal



West Valley Melter

- The WVDP is currently storing three large vessels that were removed from the vitrification facility: the melter, the concentrator feed makeup tank (CFMT), and the melter feed hold tank (MFHT).
- Although these vessels are packaged for shipment, they are not ready for disposal. Because of their association with HLW, these vessels must be evaluated according to the requirements for waste incidental to reprocessing (WIR) to determine if they are suitable for LLW disposal.



Path Forward for the Melter

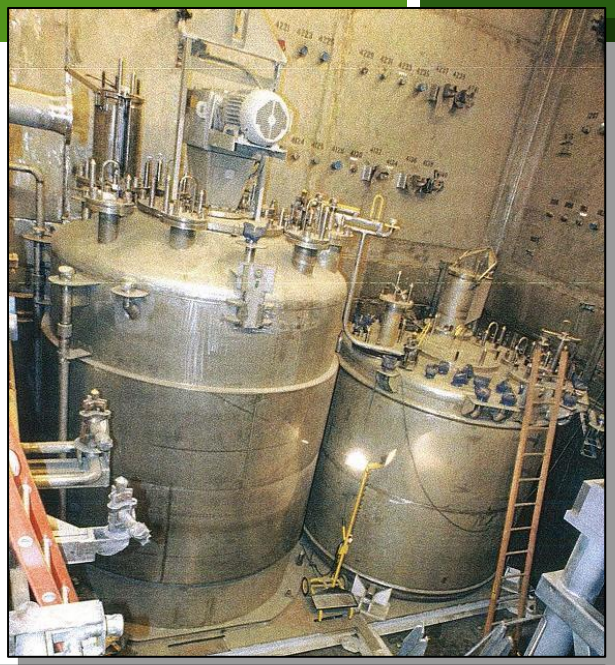
- WIR determination was published in February 2012 (Available at: http://www.wv.doe.gov/Documents/Melter_WIR_Eval_FINAL_2-1-12.pdf)
- Next steps:
  - Decide disposal location and confirm acceptability
  - Finalize and obtain authorization to ship, including route definition

Additional WIR Evaluations

Two additional vitrification system components require WIR evaluations

- Concentrator feed make-up tank (CFMT)
- Melter feed hold tank (MFHT)
- Each contains ~100 Ci, mostly Cs-137

- Each was put into a custom shielded IP-2 container and grouted in place
- CFMT loaded box is 13 x 14 x 19 feet and package weighs 355,000 pounds
- MFHT loaded box is 13 x 14 x 16 feet and package weighs 305,000 pounds
- Both boxes were shrink wrapped and are stored at the railroad staging area next to the melter

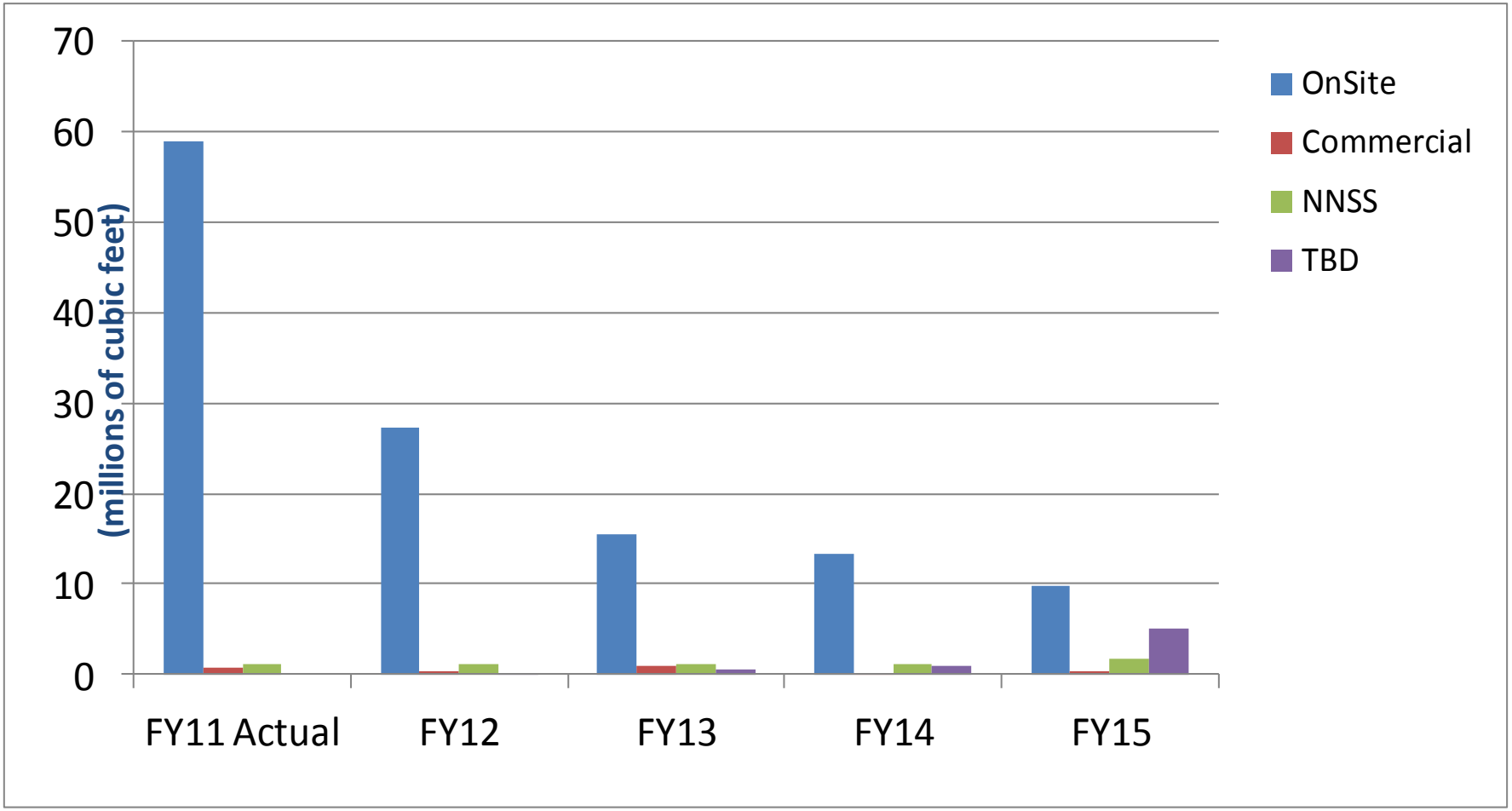


Path Forward for CFMT/MHFT

- Complete legal review of draft CFMT/MFHT WIR evaluation
- Issue draft CFMT/MFHT WIR evaluation for NRC and public review
- Resolve comments and issue final CFMT/MFHT determination

If CFMT and MFHT are determined to be LLW, *then, ship Melter, CFMT, and MFHT in one rail shipment*

DOE Complex-Wide LLW/MLLW Disposal Forecasts and Trends from WIMS



Source: 2012 WIMS preliminary data

http://www.emwims.org/

Update on Blue Ribbon Commission-Related Efforts

- In response to the Blue Ribbon Commission Report, issued in January, the Secretary established a multi-tier, DOE task force to evaluate the recommendations and develop a strategy
- EM is fully engaged and supporting this task force
- The draft strategy is under development and will be provided to Congress in July 2012

EM: A National Responsibility

- Time is not on our side – costs and risks increase over time.
- We have a responsibility to relieve future generations of this environmental and financial liability.
- We have delivered significant cleanup progress in the past several years.

K-25 East Wing Demolition at Oak Ridge, TN

Backup Slides

GTCC Generator and Storage Locations

GTCC LLRW

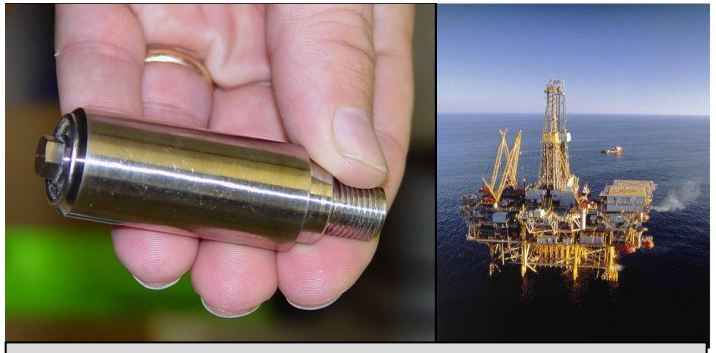
- Activated metals: primarily from nuclear power plants, most of which are located in eastern and midwestern states
- Sealed sources: throughout the U.S. (e.g., hospitals and universities)
- Other waste: Missouri, New York, Texas, and Virginia

DOE GTCC-like Waste

- West Valley Site, New York
- Babcock and Wilcox facility, Virginia
- Idaho National Laboratory, Idaho
- Oak Ridge Reservation, Tennessee
- Los Alamos National Laboratory, New Mexico

Sealed Sources

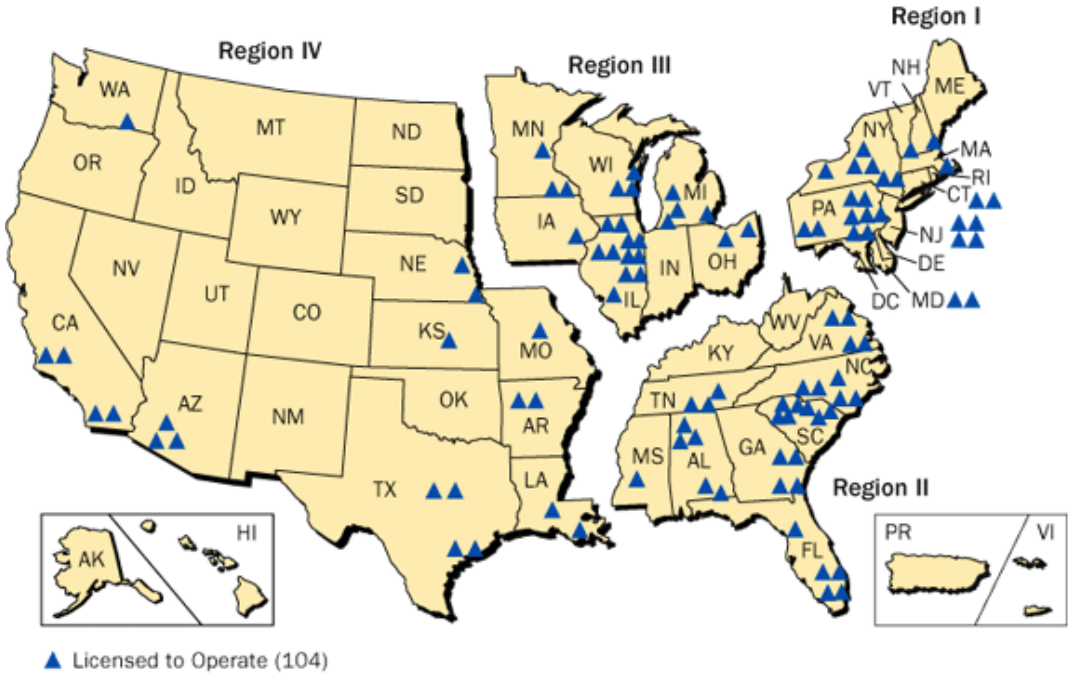
A self-shielded cesium-137 irradiator used to irradiate blood products and prevent a deadly transfusion disease (graft-versus-host disease)



A self-shielded americium-beryllium neutron source used in oil exploration (well logging)

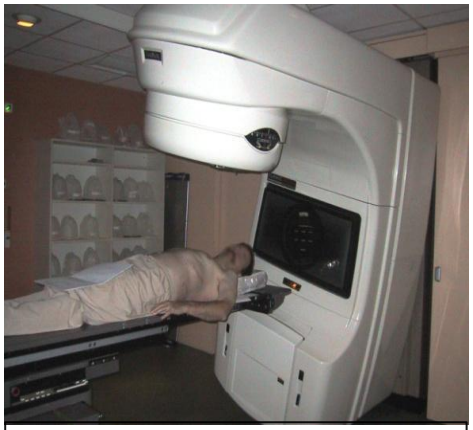
- Commonly consist of concentrated radioactive materials encapsulated in small metal containers
- Located in hospitals, universities, and industries throughout the United States
- Widely used in equipment to diagnose and treat illnesses (particularly cancer), irradiate blood for transplant patients, explore geologic formations to find oil and gas, and other beneficial purposes
- Unsecured or abandoned sealed sources are a national security concern because of their potential to be used by terrorists in a “dirty bomb”

Activated Metals



- Largely generated from decommissioning of commercial reactors
- Commercial nuclear reactors provide 19% of the Nation's electricity
- There are 104 commercial nuclear reactors currently operating in the U.S.
- Most of the reactors are not scheduled to undergo decommissioning until several decades
- Until a disposal facility is available, GTCC activated metal waste is commonly stored at the generating nuclear power plant site in concrete shielded canisters

Other Waste



Molybdenum-99 is used in cancer diagnosis/treatment

Glove boxes contaminated with GTCC Other Waste.

- Includes contaminated equipment, debris, scrap metal, filters, resins, soil, and solidified sludge associated with:
  - Production of molybdenum-99 (Mo-99)
  - Production of radioisotope power systems in support of space exploration and national security
  - Environmental cleanup of radioactively contaminated sites including the West Valley Site in New York.

Update on Mercury

- *The Mercury Export Ban Act of 2008* requires DOE to provide storage and long-term management of mercury (non-radioactive) generated in the U.S.
  - Final EIS published in January 2011
  - Sites analyzed in the EIS are Hanford (WA); INL (ID); Grand Junction (CO); Hawthorne (NV); SRS (SC); Andrews (TX); and Kansas City (MO)
  - WCS facility in Andrews, TX, is Preferred Alternative
  - http://www.mercurystorageeis.com/
- Current Status
  - The Department has not issued a Record of Decision for site selection.
  - The Department plans to reconsider the range of alternatives before issuing the ROD.
  - The Department identified two locations in New Mexico as being appropriate for evaluation in a supplement to the Mercury Storage EIS in accordance with NEPA.
  - The Supplemental Mercury Storage EIS would consider locating the above-ground Mercury Storage facility at and in the vicinity of the Waste Isolation Plant (WIPP).
  - Public Scoping will be held this Summer, including two public meetings in New Mexico.
  - The Draft SEIS will be issued in the late summer of 2012.