U.S. DEPARTMENT OF ENERGY

Waste Disposition Update

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EM SSAB Chairs Meeting

Washington, DC

2 October 2012

Discussion Topics

- Waste Stream Highlights
- DOE Transportation Update
- Greater Than Class C (GTCC) Low Level Waste Environmental Impact Statement
- Blue Ribbon Commission on America's Nuclear Future
- Nuclear Regulatory Commission's LLW Regulatory Initiatives

Waste Stream Highlights

Key Messages

- Within current budget outlook, it is especially critical that EM ensures safe, reliable and cost effective disposition paths exist.
- The program's refocused organization and the detailed planning underway for FY13 execution provide the tools needed to highlight waste management challenges and solutions.
- Due to current status of EM projects and baselines, solid waste disposition activities remain important, but are trending downward.
- EM will be focused on numerous waste-related priorities in FY13.

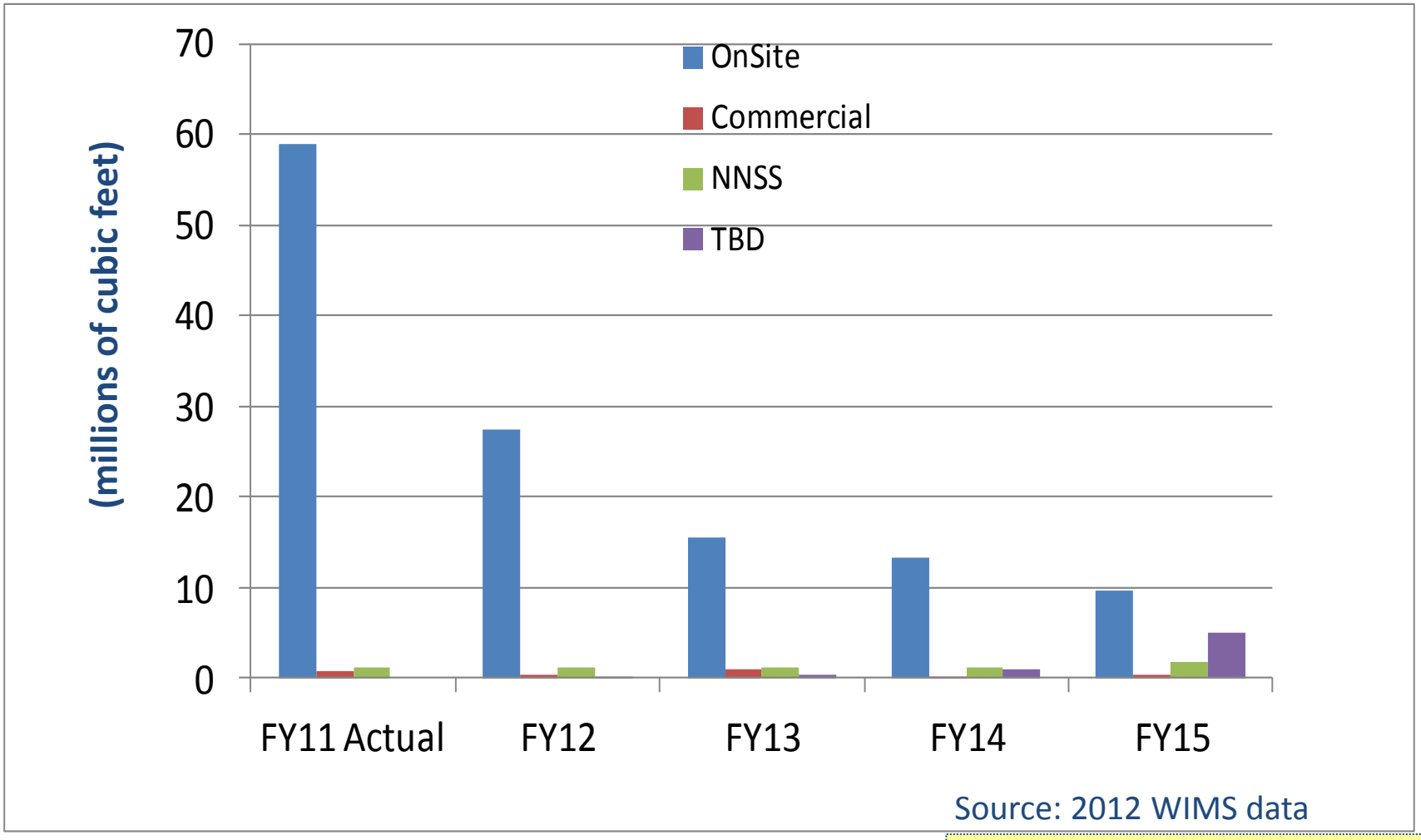
Programmatic Priorities for Waste Management

- Ensure continuous, safe operations
- Resolve technical issues
- Address waste challenges
- Maintain system and momentum
  - Optimize cost and schedule
  - Establish new disposal capacity
- Complete pending policy and environmental analyses

Low Level Waste(LLW)/Mixed Low Level Waste (MLLW) Highlights

- In FY 2012, disposal volumes were markedly lower than previous years and were less than forecast throughout the year.
  - Nevada National Security Site disposed of less than 1 million cubic feet of waste
  - Volumes sent to commercial disposal were also markedly lower than initially planned
- The overall decline in waste volumes reflects the current status and plans of EM's baselines, as well as fiscal challenges.

DOE Complex-Wide LLW/MLLW Disposal Forecasts and Trends



Source: 2012 WIMS data

http://www.emwims.org/

Final Generator Forecasts for Disposal at the NNSS in FY 2012 (Cubic Feet)

Generator Site	April Forecast	July Forecast
Oak Ridge Reservation (TN)	407,000	256,000
Oak Ridge NNSA/Y-12 (TN)	206,000	155,000
Los Alamos National Lab (NM)	96,000	95,000
Idaho Site (ID)	91,000	92,000
NNSA/Nuclear Fuel Services (TN)	88,000	74,000
Berkeley National Lab (CA)	79,000	45,000
Livermore Nat'l Lab (CA)	59,000	45,000
Portsmouth GDP (OH)	42,000	41,000
West Valley (NY)	38,000	40,000
Savannah River (SC)	35,000	23,000
Onsite NNSS (NV)	21,000	19,000
Paducah GDP (KY)	17,000	15,000
All other sites	68,000	44,000
Total	**1,247,000**	**944,000**

Currently, there are 26 approved generator programs at 20 sites that can send LLW & MLLW to NNSS.

Based on current weekly disposal rates, total FY 2012 disposal is expected to be less than the July forecast.

Preliminary Generator Forecast for Disposal at the NNSS in FY 2013

Generator Site	Cubic Feet	%
Portsmouth GDP (OH)	361,000	30
Oak Ridge Reservation (TN)	273,000	23
Oak Ridge NNSA/Y-12 (TN)	120,000	10
Los Alamos National Lab (NM)	104,000	9
Idaho Site (ID)	84,000	7
Livermore Nat'l Lab (CA)	69,000	6
Paducah GDP (KY)	51,000	4
NNSA/Nuclear Fuel Services (TN)	51,000	4
Onsite NNSS (NV)	21,000	2
Savannah River (SC)	20,000	2
West Valley (NY)	16,000	1
All other sites	33,000	3
Total	**1,204,000**	

LLW/MLLW Highlights

- Commercial market changed significantly this year.
  - Waste Control Specialists (in Andrews, TX) began operations of its compact (commercial facility) in April 2012.
  - WCS also completed construction of its Federal Waste Disposal Facility, and TX regulators approved its operations on September 18, 2012.
  - To date, no DOE waste has been sent to WCS for disposal in Federal facility.
- Greater disposal availability exists for commercial LLW streams
- DOE efforts towards new complex-wide LLW/MLLW disposal contract(s) continues.

LLW/MLLW Highlights

- Waste Incidental to Reprocessing (WIR) Determinations pursuant to DOE Order 435.1
  - Published first WIR Determination for West Valley melter
  - Second WIR Determination in process, for two additional West Valley components
- NNSS Site Wide EIS nearing completion
  - Includes analysis of bounding ten year LLW/MLLW disposal operation
- Shipment of first of several RTGs from ORNL to NNSS for disposal

LLW/MLLW Highlights

- DUF6 Conversion facilities (Portsmouth and Paducah) continue operations, with nearly 6,000 metric tons processed
  - Technical issues impeding full throughput during initial year of operations
  - Equipment replacement underway
  - Converted cylinders currently stored on site, pending future NEPA analyses and decision on disposal site(s)

- U233 Disposition Project
  - Direct disposition campaign & Phase 2 planning approved, which will result in nearly $600M cost avoidance
  - 24 of 27 planned ZPR plate shipments to NNSS completed, where material will be stored for future programmatic reuse

- Sites continue to rely and optimize use of on-site disposal facilities to support site cleanup
  - Hanford, Idaho and Oak Ridge undertook recent improvements
  - Both PORTS and PAD are proposing onsite CERCLA facilities

Transuranic (TRU) Waste Highlights

- National TRU Waste Corporate Board underway this week
  - Collaborative review and update of National TRU Waste Management Plan, providing integrated five-year outlook for TRU waste complex
- New WIPP M&O Contractor – Nuclear Waste Partnership (NWP) – assumed operations of site and National TRU Waste Program on October 1, 2012.
- DOE met the first year commitment under the LANL Framework Agreement "3706 Project"
  - 800 m^3 of above ground, combustible TRU removed from site in FY12.

TRU Waste Highlights

- FY 2013 TRU shipping priorities include
  - LANL – to meet the Framework Agreement between DOE and NM
  - Idaho – to meet the Idaho Settlement Agreement milestones
  - Savannah River Site – to complete legacy CH and RH TRU removal
  - Argonne National Lab – to remove certified RH TRU from site, generated by Alpha Gamma Hot Cell Facility cleanout
- At Savannah River Site – remediation of legacy TRU nearing completion
- At LANL – "3706 Project" continues and buried TRU strategy is underdevelopment
- At Oak Ridge – efforts continue to prepare TRU portion of inventory at TRU Waste Processing Facility

TRU Waste Highlights

- At Idaho –
  - AMWTP resumed retrieval operations and is refining its detailed baseline for project completion
  - ARP 7 exhumation nearing completion, and ARP 8 construction continues
  - Evaluating alternative treatment for portion of sludge stream utilizing existing site capabilities
  - RH TRU treatment continues and will provide steady state of RH shipments to WIPP
- At Richland –
  - Onsite cleanup continues to generate TRU wastes, which are stored on site pending future shipment to WIPP
  - Preparations continue to relocated RH TRU sludges from K-Basin to T Plant for interim storage and treatment

Tank Waste/High Level Waste (HLW) Highlights

Near term focus is on resolution of technical issues.

- Waste Treatment Plant, Hanford
  - Design challenges have been identified and are actively being addressed through development of a comprehensive plan
  - Baseline revision planned after technical issues further resolved
  - Initiating more detailed planning for disposition of “TRU tanks”
- Integrated Waste Treatment Unit, Idaho
  - Completed construction in 2011, but technical issues encountered during startup
  - Facility recovery and modifications ongoing, with goal to initiate sodium bearing waste treatment as soon as feasible
  - Working with regulators to revise treatment milestone
- Salt Waste Processing Facility, Savannah River
  - Delays in NQA-1 components have impacted schedule and cost
  - Baseline revision underway, focused on earliest start at lowest cost

Establishing New Capabilities

- GTCC LLW Disposal Facility
  - Final EIS targeted for publication late CY12/early CY13
- Mercury Storage
  - Final EIS published early FY11, but supplement underway to evaluate additional alternative
  - Completion anticipated in early FY13
- Salt Disposal Investigations
  - Working with the Office of Nuclear Energy, EM and Carlsbad have embarked on review of past studies related to potential disposal of heat-generating wastes in salt
  - Also, mining alcove using existing resources, to prepare for planned heater test which can inform future disposition plans

Status of DOE Order 435.1 Update

- **Efforts continue to complete the revision of DOE Order 435.1, *Radioactive Waste Management***

Current Activities

- Complete technical updates and first draft of new Technical Standard
- DOE General Counsel review
- Informal cross-PSO and Field review

Fall/Winter 2012

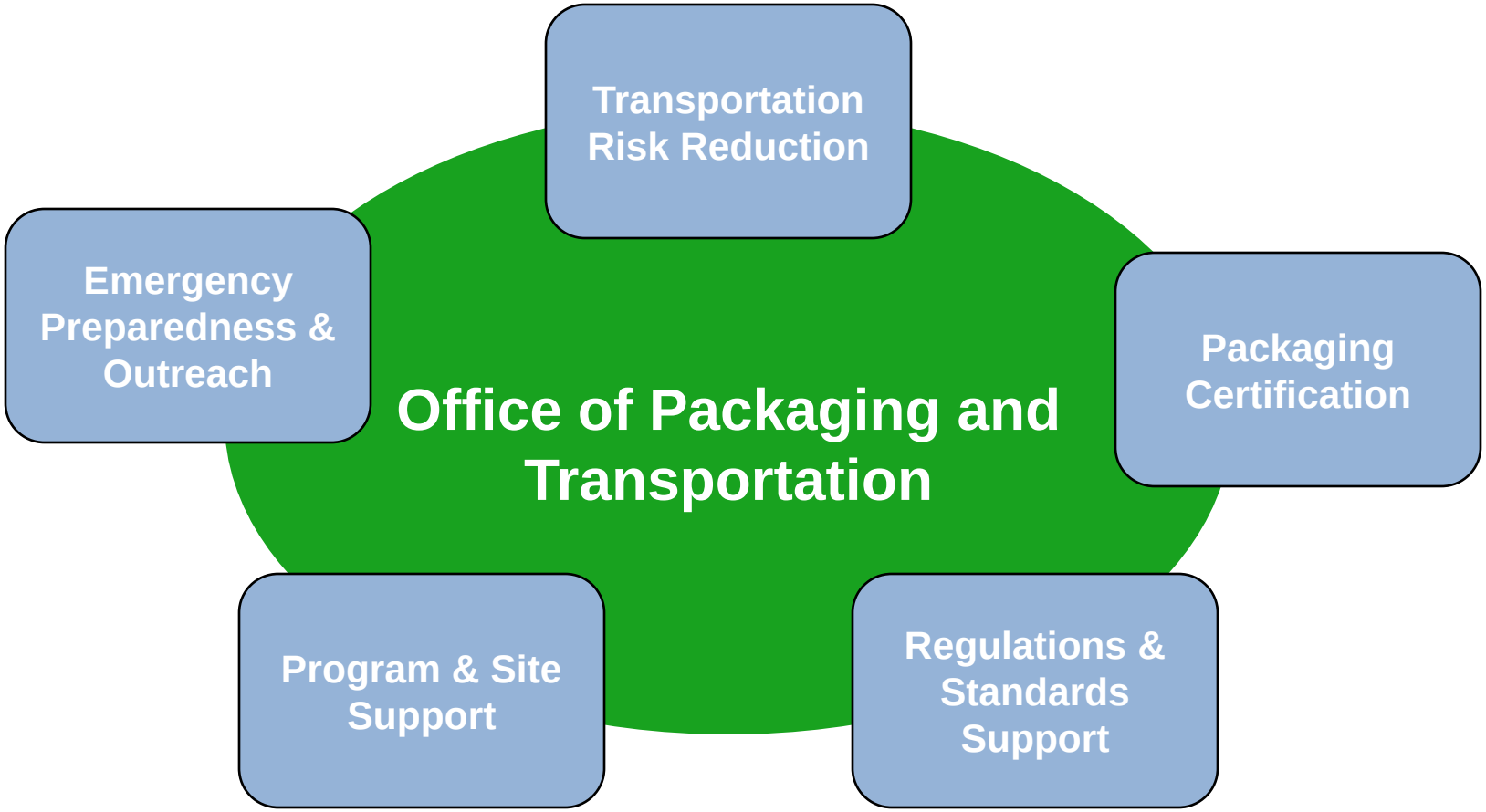
- Continue discussions with stakeholders
- Release updated DOE O 435.1 for public review (target late October)
- Formal DOE review through RevCom

Spring 2013

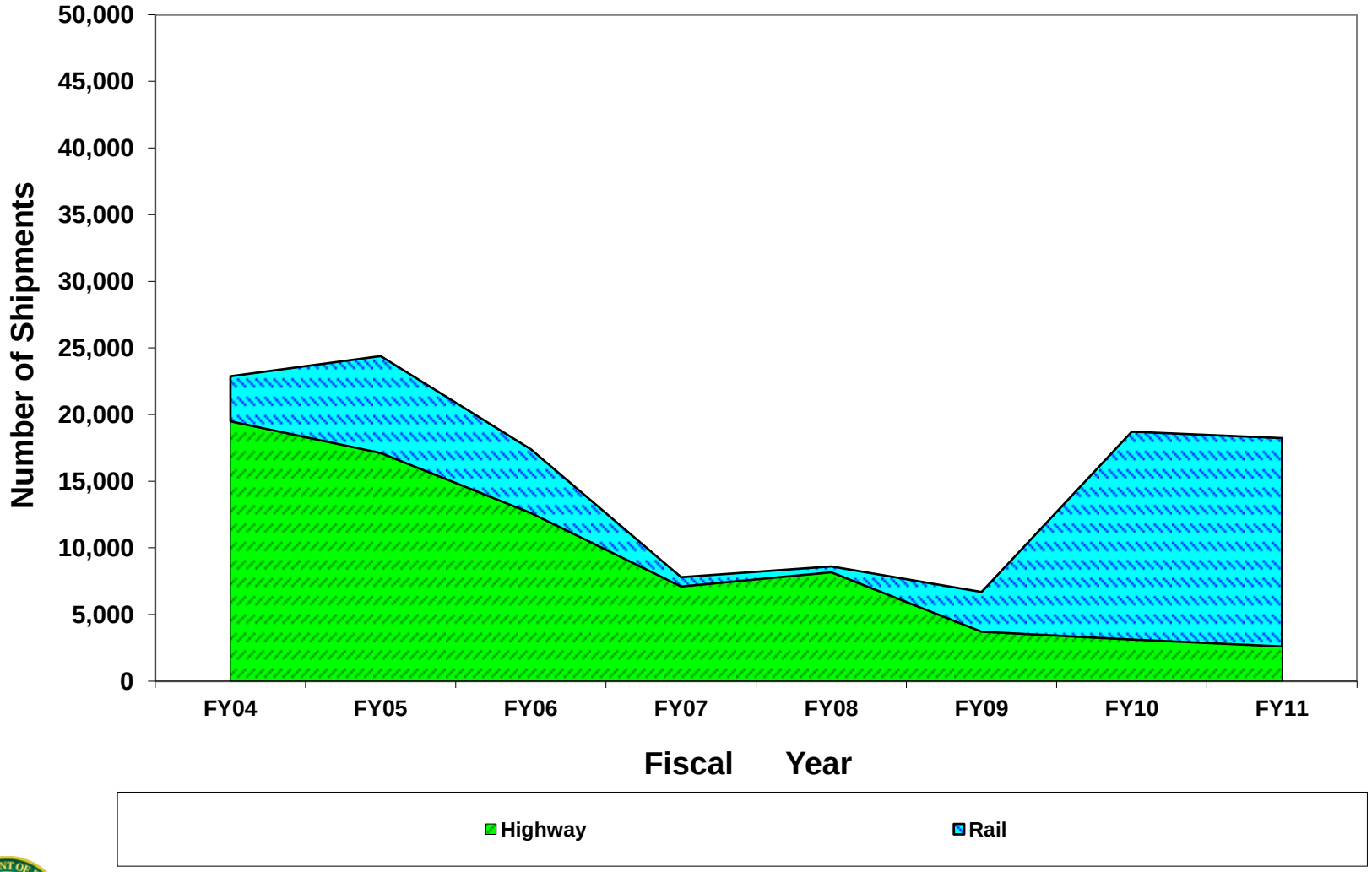
- Release final DOE 435.1 for use across the complex
- Begin outreach and training to DOE and contractor staff

Transportation Update

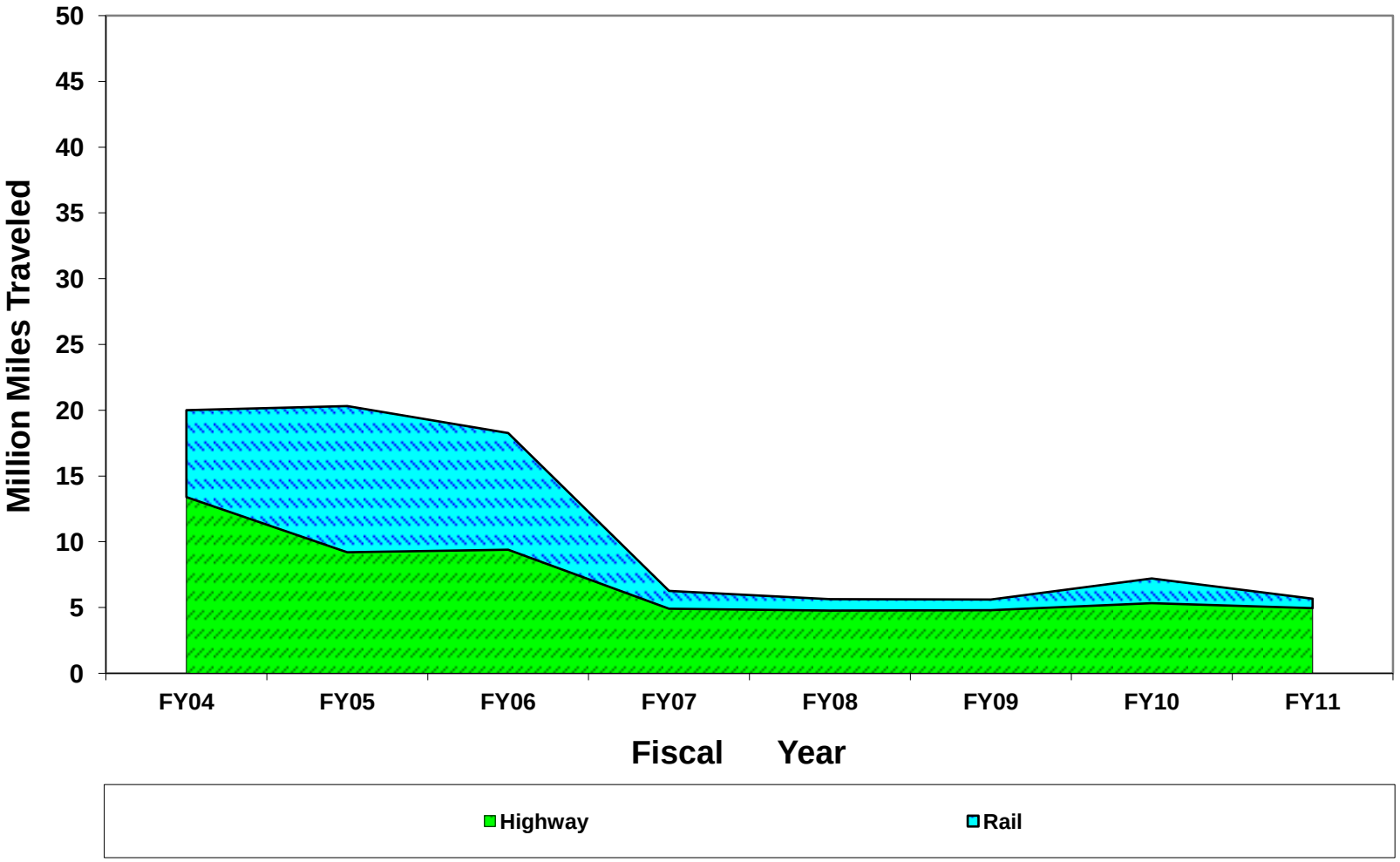
Packaging and Transportation Program Components



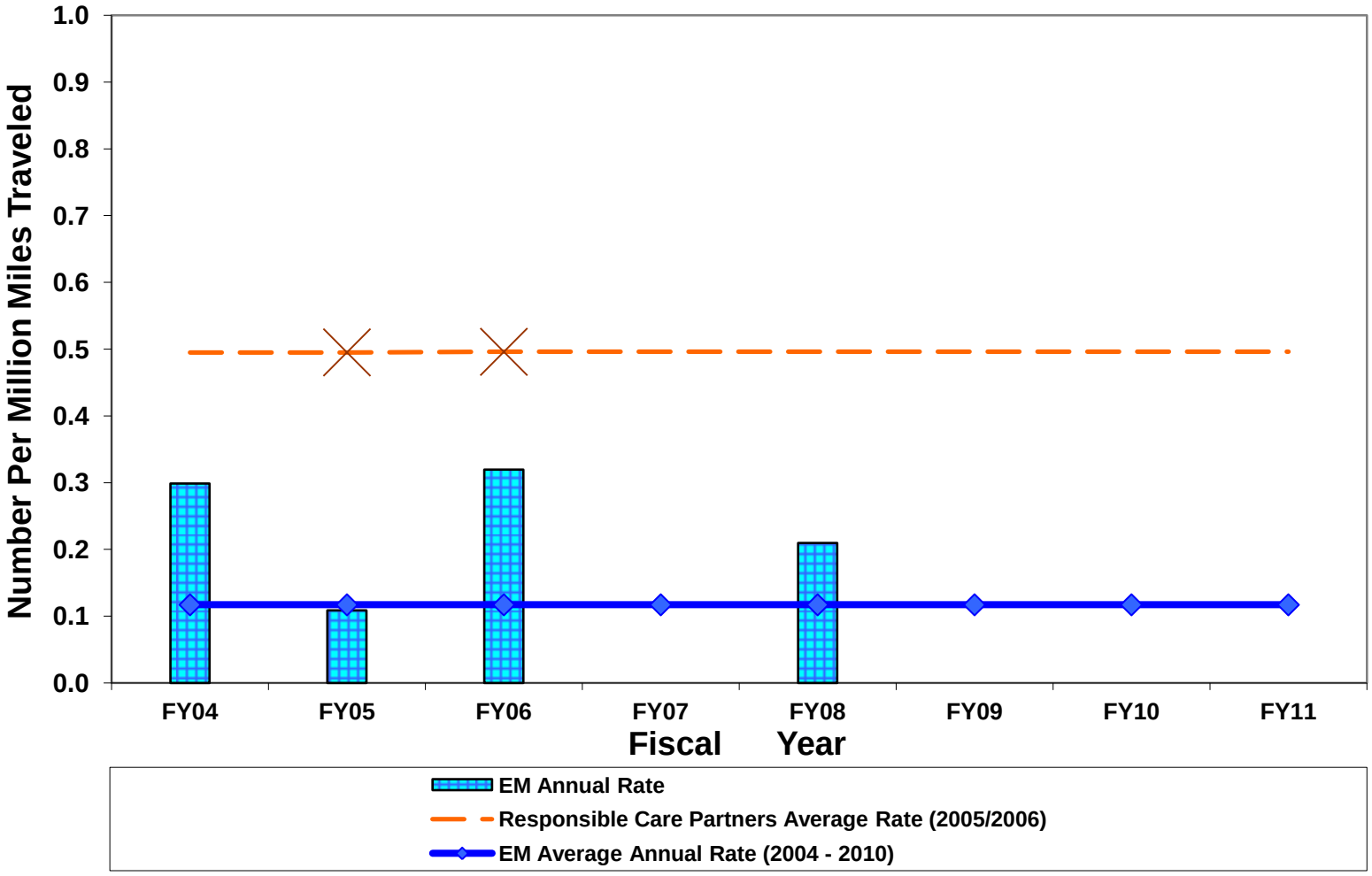
EM HAZMAT Annual Shipments



EM HAZMAT Annual Shipment Mileage



EM HAZMAT Shipment Reportable Rate Comparison

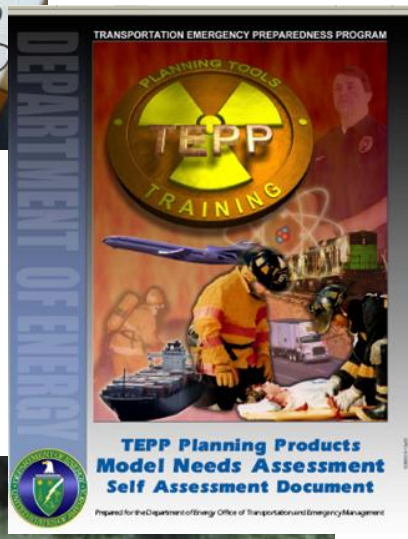


Transportation Emergency Preparedness Program

www.em.doe.gov/otem

- Program ensures that federal, state, tribal, and local responders have access to the plans, training, and technical assistance necessary to safely, efficiently, and effectively respond to a radiological transportation incident.

- Aspects of the Program includes:
  - Upfront planning tools
    - Needs Assessment
    - Model Plans and Procedures
  - Comprehensive training program
    - Awareness
    - Ops
    - Technician
    - Specialist
    - Hospital
  - Drill and exercise program that is compliant with the Homeland Security Exercise Evaluation Program



Collaboration Thru State Regional Groups

- Packaging and transportation issues are addressed on a regional basis through the State Regional Groups.
  - Western Governors' Association
  - Midwest Council of State Governments
  - Northeast Council of State Governments
  - Southern States Energy Board

National Transportation Stakeholders Forum (NTSF)

- NTSF is the mechanism through which DOE communicates at a national level with states and tribes about its radioactive waste and materials shipments (as well as occasional high-visibility shipments that are nonradioactive)

- NTSF brings transparency, openness, and accountability to DOE's offsite transportation activities through collaboration with state and tribal governments.
  - The NTSF completed its 3rd successful meeting in May 2012 in Knoxville, TN.
  - The 2013 Planning Committee established, includes representatives from the tribes, 4 regional groups, and NCSL
  - NE-CSG will serve as the host for the 2013 meeting (early spring)

- Working Groups established to perform more in depth review and to assist DOE in development of path forward for addressing transportation issues.

- Webinars are conducted on a quarterly basis to keep in touch on important issues.

www.ntsf.wikidot.com.

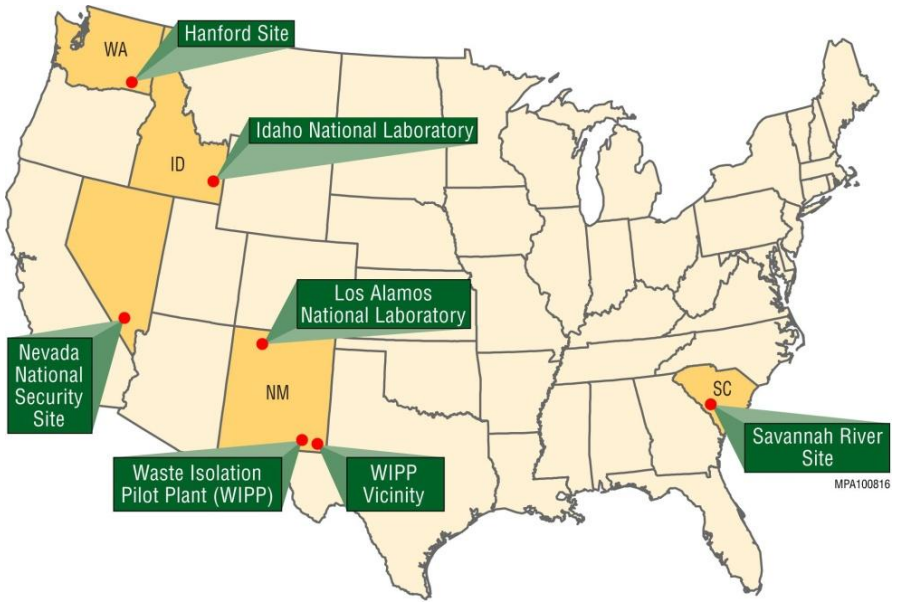
GTCC LLW EIS

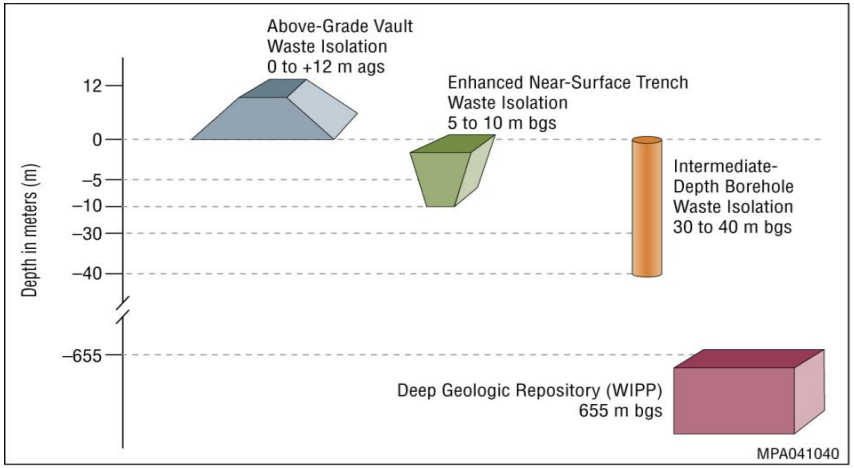
Greater-than-Class C LLW & DOE GTCC-Like Waste

- The LLW Policy Amendments Act of 1985 assigned to the Federal Government the responsibility for disposal of Greater-than-Class C (GTCC) LLW resulting from NRC-licensed activities.
- DOE is evaluating disposal options for GTCC LLW and DOE "GTCC-like" LLW which does not have a current disposal option.
- GTCC LLW and GTCC-like LLW represent relatively small volume (~400,000 ft^3), but high activity.
  - Less than 10% of total volume currently in storage; most waste will not be generated for several decades.
- Three Waste Types
  - Activated metals : 71,000 ft^3 with 160 Mci
    - Majority of waste will not be generated for decades --decommissioning
  - Sealed sources: 102,000 ft^3 with 2.0 Mci
    - Present National Security Concern
  - Other Waste: 237,000 ft^3 with 1.3 Mci
    - Over 50% may never be generated

Disposal Alternatives Evaluated for GTCC LLRW

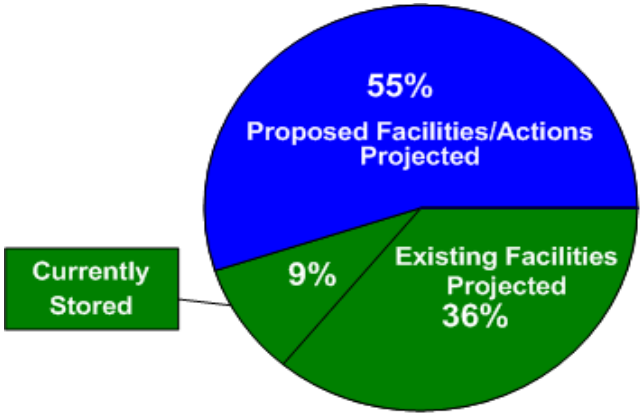
1. No Action: Continue current storage/management practices
2. Geologic Repository at Waste Isolation Pilot Plant (WIPP)
3. Boreholes at Hanford, Idaho National Laboratory (INL), Los Alamos National Laboratory (LANL), Nevada National Security Site (NNSS), WIPP Vicinity, and generic commercial location in Region IV (west)
4. Trenches at Hanford, INL, LANL, NNSS, Savannah River Site (SRS), WIPP Vicinity and generic commercial location in Regions II and IV (southeast and west)
5. Vaults at Hanford, INL, LANL, NNSS, SRS, WIPP Vicinity, and generic commercial location in Regions I-IV (northeast, southeast, midwest, and west)



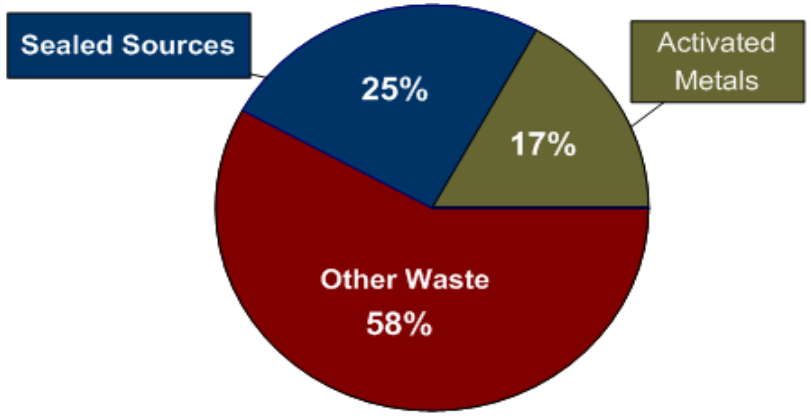


Draft GTCC EIS did not contain a preferred alternative (preferred alternative to be included in Final GTCC EIS).

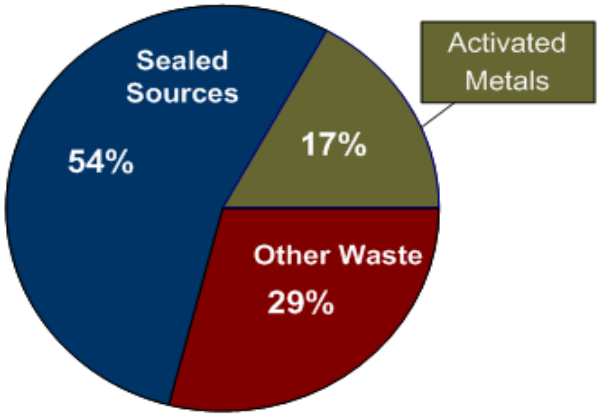
GTCC Waste Inventory



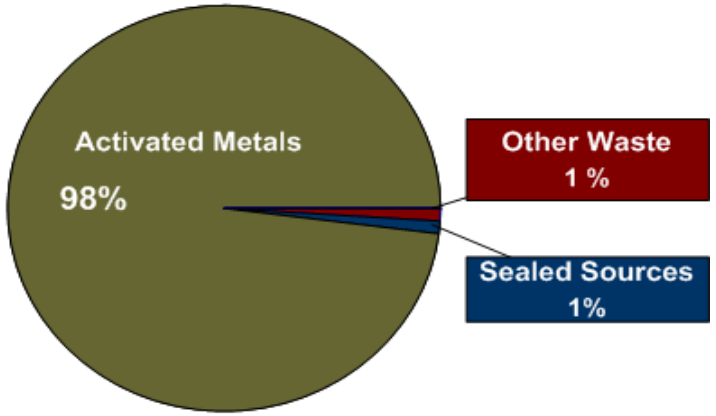
Total Volume of Waste = 11,600 m^3
Stored & Projected (existing facilities) = 5,200 m^3
Projected (proposed facilities/actions) = 6,400 m^3



Total Volume by Waste Type
Activated Metals: 2,000 m^3
Sealed Sources: 2,900 m^3
Other Waste: 6,700 m^3

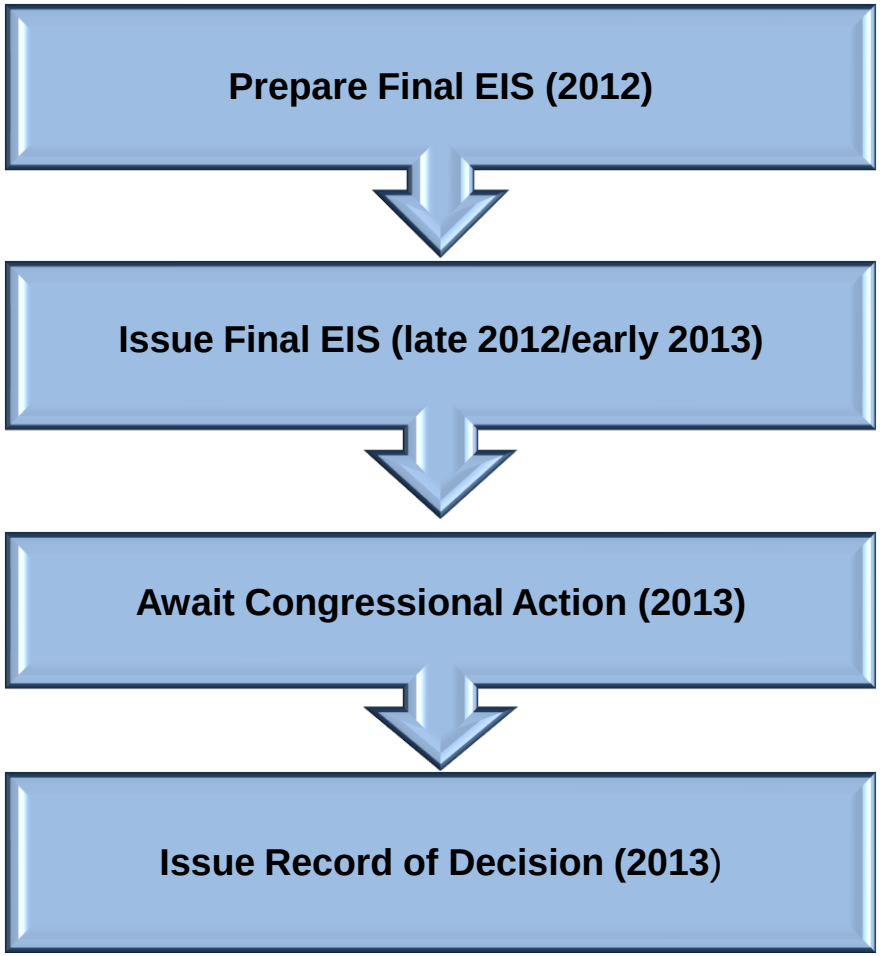


Total Volume of Stored & Projected Waste (existing facilities)
Activated Metals: 890 m^3
Sealed Sources: 2,800 m^3
Other Waste: 1,550 m^3



Waste Type Curies for Total Waste Volume
Activated Metals: 160 MCi
Sealed Sources: 2 MCi
Other Waste: 1MCi

Path Forward for GTCC EIS



Submit Report to Congress (FY 2013)

In accordance with Section 631 of EPAct & Section (3)(b)(1)(D) of Low-Level Radioactive Waste Policy Amendments Act , the Report to Congress will:

- Propose actions to ensure safe disposal of such identified radioactive wastes
- Describe alternatives under consideration
- Identify the Federal and non-Federal options for disposal
- Describe projected costs
- Identify options for ensuring that the beneficiaries of the activities resulting from the generation of GTCC waste bear all reasonable costs of disposing of such wastes
- Identify statutory authority required for disposal of GTCC waste

Blue Ribbon Commission

BRC Overview: Background

- Established by the President's Memorandum for the Secretary of Energy on January 29, 2010
- Charge to the Commission: Conduct a comprehensive review of policies for managing the back end of the nuclear fuel cycle and recommend a new strategy
- Deliver recommendations to the Secretary of Energy by January 29, 2012 (COMPLETE January 26, 2012)

BRC Overview: Recommendations

1. A new, consent-based approach to siting and development
2. A new organization dedicated solely to implementing the waste management program and empowered with the authority and resources to succeed
3. Access to the funds nuclear utility ratepayers are providing for the purpose of nuclear waste management
4. Prompt efforts to develop one or more geologic disposal facilities
5. Prompt efforts to develop one or more consolidated storage facilities
6. Prompt efforts to prepare for the eventual large scale transport of spent nuclear fuel and high-level waste to consolidated storage and disposal facilities when such facilities become available
7. Support for continued U.S. innovation in nuclear energy technology and for workforce development
8. Active U.S. leadership in international efforts to address safety, waste management, nonproliferation, and security concerns

Elements of BRC Recommendations

Governance & Funding

- A single-purpose organization, empowered with the authority to succeed
- Adequate resources

Consent-based Facilities Siting

System Design

Phased, Adaptive, Staged

- One or more consolidated storage facilities
- One or more geologic disposal facilities
- Transportation system designed, regulated, and executed for safe and secure interstate shipping

DOE Took Steps to Respond Positively and Aggressively to the BRC Report

- The conference report accompanying FY 2012 appropriations emphasized that the Department should develop a strategy for the management of used nuclear fuel and other nuclear waste within six months of publication of the Commission's report.
- February 6, 2012 memorandum from Secretary (S-1) approved execution strategy:
  - A three tier intra-departmental assessment and action process
    - Working-level Task Force, representing several DOE offices – came to be known as the Management and Disposition Working Group (MDWG)
    - A review-level Steering Committee, consisting of deputies (chaired by NE-2)
    - A decision-level Policy Council to support S1/2 decisions (coordinated by NE-1)
  - Links formally established at each level with the White House (OMB, OSTP, Domestic Policy Council and Intergovernmental Affairs).
- S-1 memo also approved recommendation that the Department collaborate with Congress as it drafts legislation related to the BRC recommendations, to be lead by NE and CI.

Status & Next Steps

- Since publication of the BRC Report, DOE has vocally supported its findings and recommendations.
  - ★ Repository and interim storage sites will be considered in accordance with a consent-based process as outlined by the BRC.
- DOE has been evaluating the recommendations of the BRC regarding long-term waste storage and disposal and discussing and developing a potential strategy and action plan.
- The Administration's strategy on these matters was expected to be delivered to Congress in Summer 2012.
- Once the strategy is submitted to Congress, additional details will be available.
- Implementation details remain uncertain. Look to new Congress for any potential legislative initiatives.

Implications for Tank Waste Program

- Pending more information on Congressional and stakeholder reaction to the BRC and Administrations response, EM's near term efforts will be largely unchanged.
  - Continued focus on safe, effective management, retrieval and treatment of our tank waste/high level waste inventories
  - Continued R&D on alternatives to improve techniques, advance waste forms, optimize disposition paths
  - Continued collaboration with Nuclear Energy on their ongoing generic repository evaluations

BRC recognized success of WIPP as model for future repository

- State and local support exists for a science-based expansion of WIPP.
  - September 2011 letter from New Mexico Governor Martinez to the Secretary of Energy
  - Consistent with several of the Blue Ribbon Commission (BRC) recommendations (i.e., consent-based siting).
- Past studies at WIPP provide sound foundation for continuing research.
- Initial information indicates disposal at WIPP is a viable option for many DOE-owned wastes.
- Carlsbad, LANL and SNL have developed detailed proposals for studying and demonstrating disposal of DOE waste forms in salt.
- EM has established, strong relationships with New Mexico government and oversight agencies and Carlsbad elected officials.
- EM is working closely with Nuclear Energy to conduct additional research and support future policy direction.

NRC LLW Regulatory Initiatives

NRC LLW Regulatory Initiatives

- **Volume Reduction Policy Statement**

  – **Final update published on May 1, 2012 (77 FR 25760)**
  – Reaffirmed earlier 1981 volume reduction policy
  – Recognized progress made in reducing waste volumes
  – Recognized volume reduction is only one aspect of LLW Management
  – Suggests licensees consider all means available to manage waste in a manner that is secure and protects public health and safety
  – Disposal considered the safest and most secure long-term management approach

NRC LLW Regulatory Initiatives

- **Concentration Averaging Branch Technical Position (BTP)**
  - Intended to provide guidance to waste generators on the interpretation of 10 CFR 61.55(a)(8):

    "The concentration of a radionuclide [in waste] may be averaged over the volume of the waste, or weight of the waste if the units [on the values tabulated in the concentration tables] are expressed as nanocuries per gram"

  - Previous BTP discouraged mixing to lower waste classification, but recognized that some mixing is unavoidable
  - NRC staff recommended that current blending guidance could be improved if it were risk-informed and performance-based
  - Replaced factor of 10 constraint on inputs for blended waste with more performance-based test on outputs
  - Increased recommended activity limit for Cs-137 sealed source disposal, among others
  - *Federal Register notice published June 11, 2012 (77 FR 34411)*
  - **Public comment period ends October 8, 2012**

NRC LLW Regulatory Initiatives

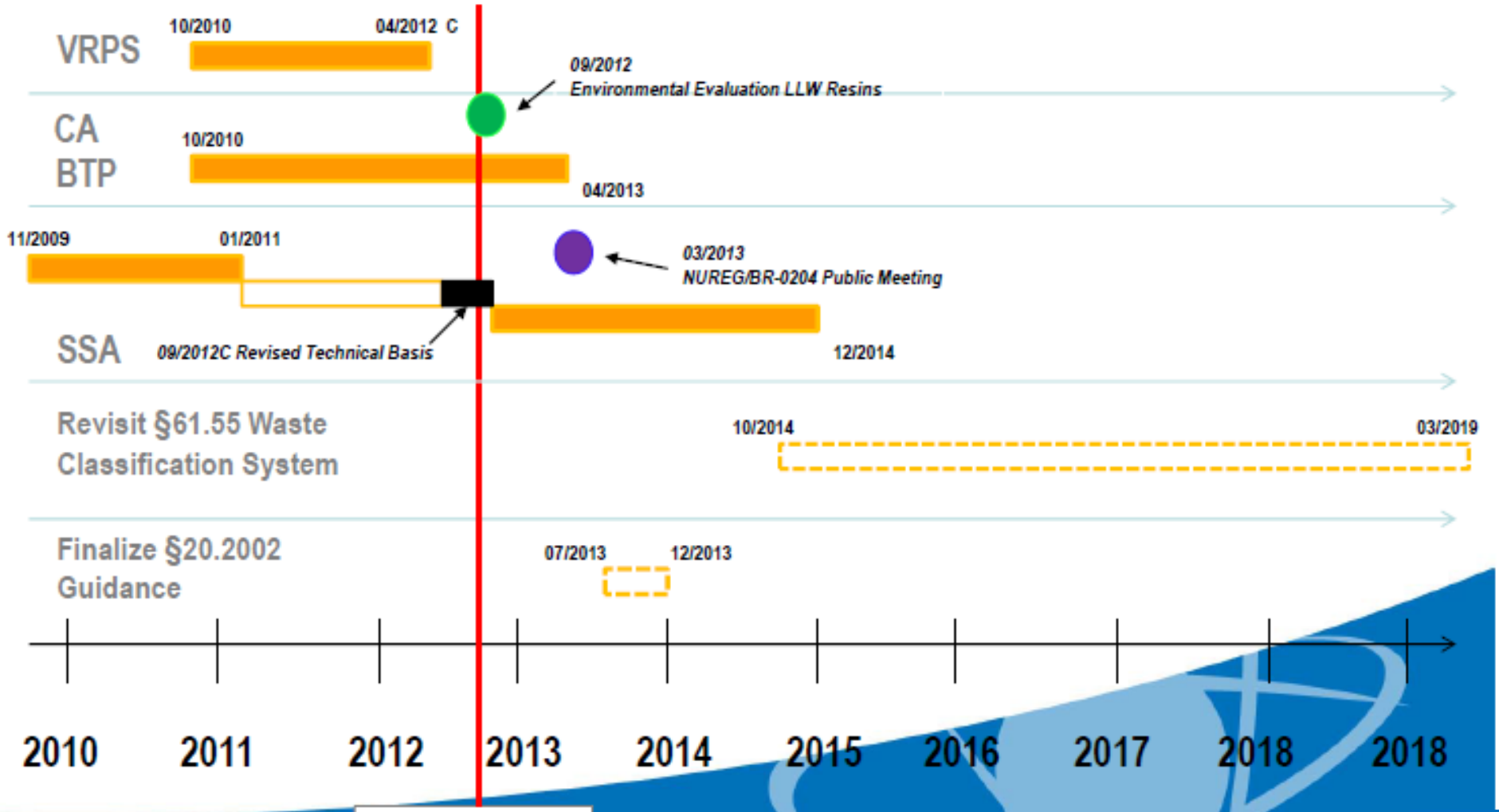
- **Site Specific Analysis Rulemaking**
  - SRM-SECY-08-0147 (March 18, 2009)

  " …proceed with rulemaking in 10 CFR Part 61 to specify a requirement for a site-specific analysis for the disposal of large quantities of depleted uranium (DU) and the technical requirements for such an analysis … develop a guidance document for public comment that outlines the parameters and assumptions to be used in conducting such site-specific analyses …."
  - SRM-COMWDM-11-0002/COMGEA-11-0002 (January 19, 2012)

  - Flexibility to use current International Commission on Radiological Protection (ICRP) dose methodologies
  - Two-tiered period of performance:
    - *Tier 1: Compliance period covering reasonably foreseeable future*
    - *Tier 2: Longer period based on site characteristics and peak dose to a* designated receptor, that is not *a priori*
  - Flexibility to establish site-specific waste acceptance criteria based on site's performance assessment results and intruder assessment
  - Balance Federal-State alignment and flexibility

LLW Program Timeline In Perspective

U.S.NRC
United States Nuclear Regulatory Commission
Protecting People and the Environment



Concluding Thoughts

- Complex-wide, EM has a strong mission unit focus on waste management, including policies, projects and the supporting transportation planning and infrastructure.
- EM continues to make progress toward disposition of its legacy wastes and optimized management of newly generated wastes.
- Despite funding challenges, we plan to maintain our progress and meet our waste management goals.
- We are addressing some of our greatest waste-related technical challenges now, many of which require one-of-a-kind or ground-breaking solutions.
- Our ability to work together to optimize our cleanup and waste management strategies is as critical as ever, in light of the fiscal challenges we face.