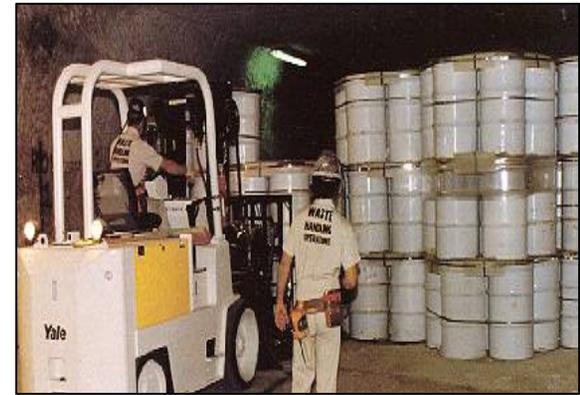


Waste and Materials Disposition Update from EM's Office of Regulatory Compliance



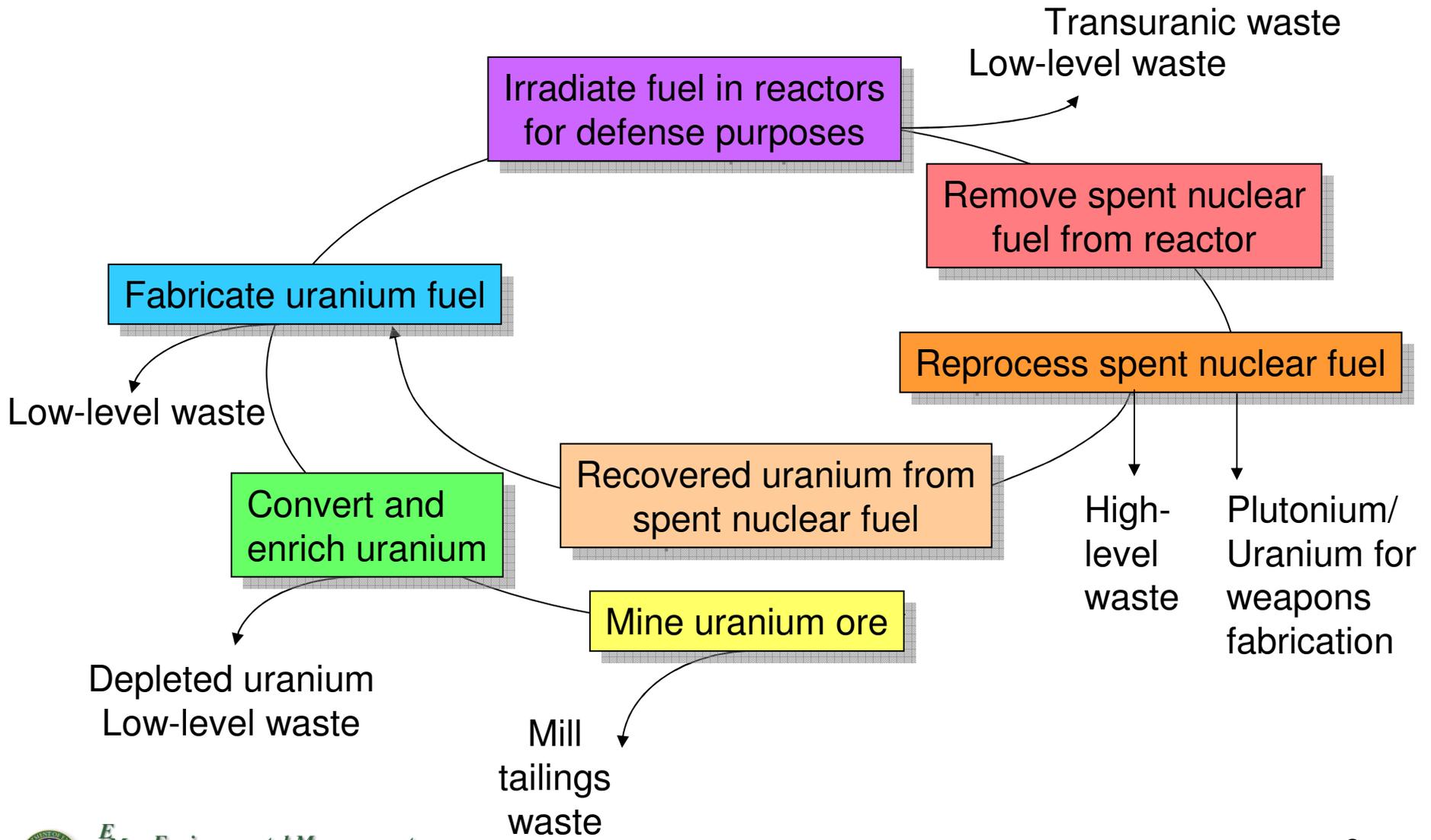
EM Site Specific Advisory Board Chairs Meeting September 2008

*Frank Marcinowski
Deputy Assistant Secretary
for Regulatory Compliance
Office of Environmental Management*

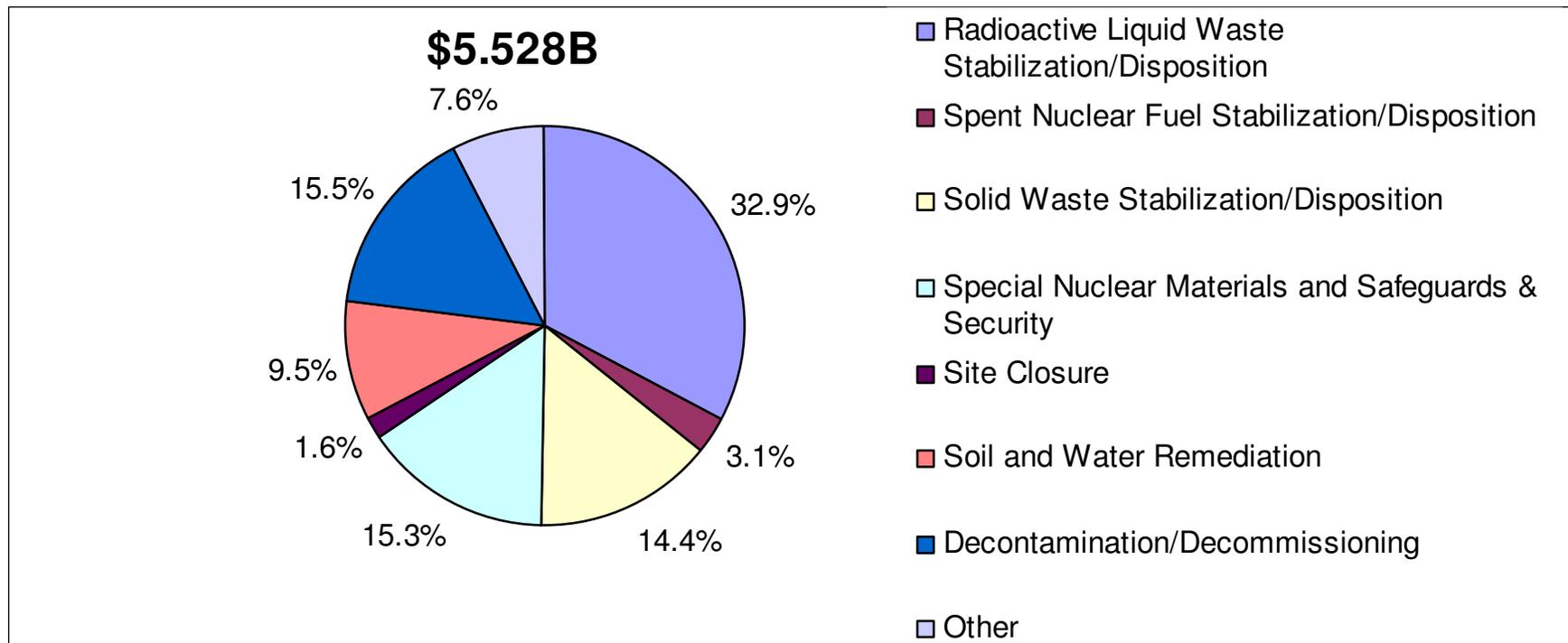
Discussion Topics

- Introduction:
 - Budget outlook
 - Waste disposition overview
- Updates by Waste Stream
 - Low-level and Mixed Low-level (LLW/MLLW)
 - Transuranic (TRU) waste management program
 - High Level/Liquid Tank Waste update
- Office of Compliance Update
 - Planned initiatives related to waste management policy
- Status of the GTCC LLW Disposal EIS
- Update on EM's integrated nickel disposition project

DOE's role in the nuclear fuel cycle is key to understanding EM's waste and materials management challenges

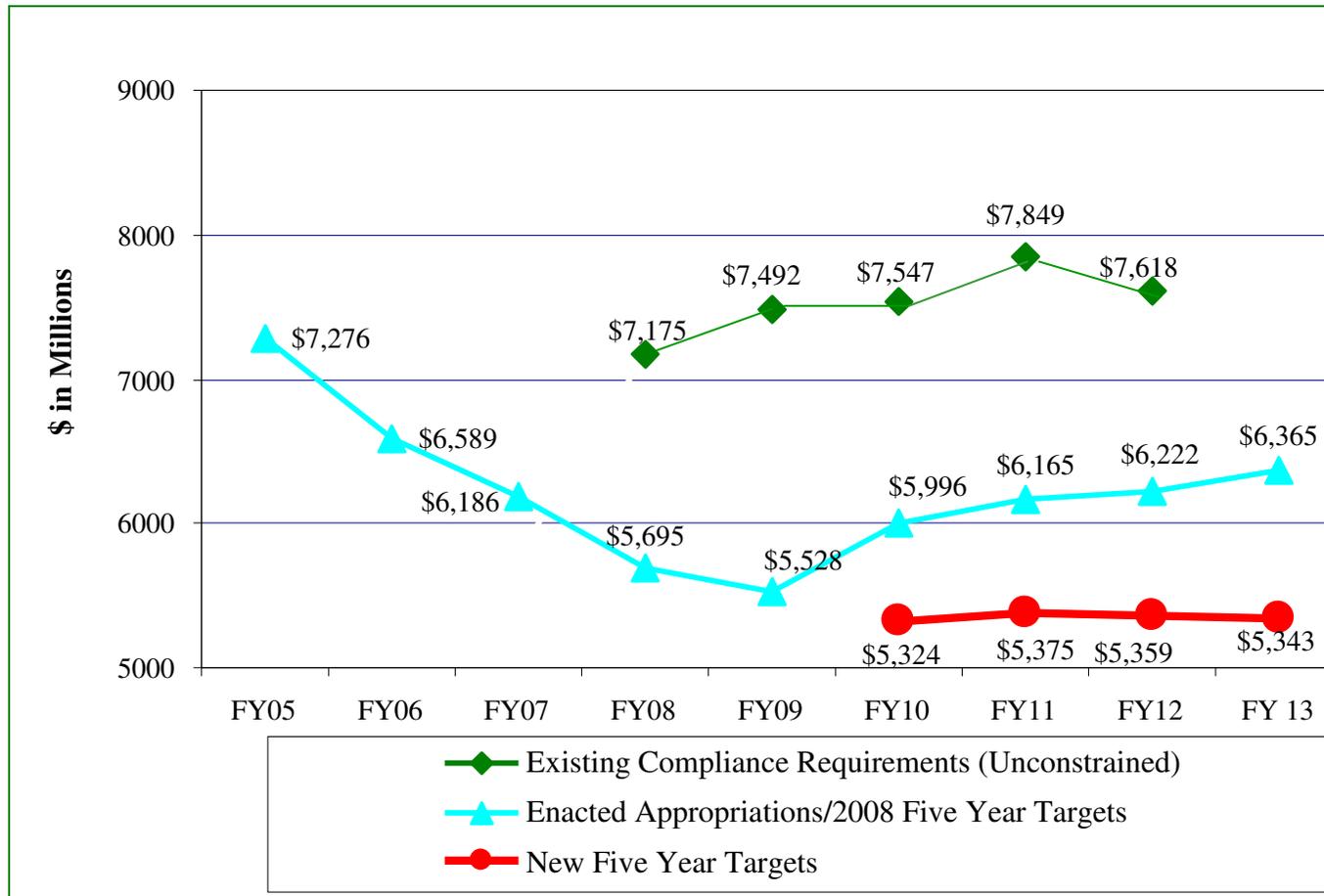


The FY 2009 Request was structured to address EM's "min safe" requirements and highest risk activities.



Other is comprised of:
Program Direction, Technology Development,
Contribution to the D&D Fund, Uranium/Thorium
Reimbursements, Headquarters, and Community and
Regulatory Support

...but our requirements exceed our allocated resources



* FY 2006/2007 baseline data not available

DOE-EM's radioactive waste management priorities....

- Continue to manage waste inventories in safe, compliant manner
- Address high risk waste in a cost-effective manner
- Maintain and optimize current disposal capability for future generations
- Develop future disposal capacity in an complex environment
- Promote the development of treatment alternatives in the commercial sector
- Review current policies and directives within DOE



DOE waste management-related concerns....

- Availability of resources needed to meet existing compliance requirements
- Increasing costs due to growing scope and market conditions
- Uncertainty in availability of future disposal capacity
- Uncertainty of future waste projections (GTCC) resulting from GNEP initiatives
- Potential challenges to DOE policies and strategies
- Ability to address excess facilities and materials scope within constrained resources
- Potential natural resource damages
- Increasing inquiries from outside DOE for access to DOE low-level and mixed low-level waste facilities, due to changing circumstances

Waste Stream Updates



EM *Environmental Management*

safety ❖ performance ❖ cleanup ❖ closure

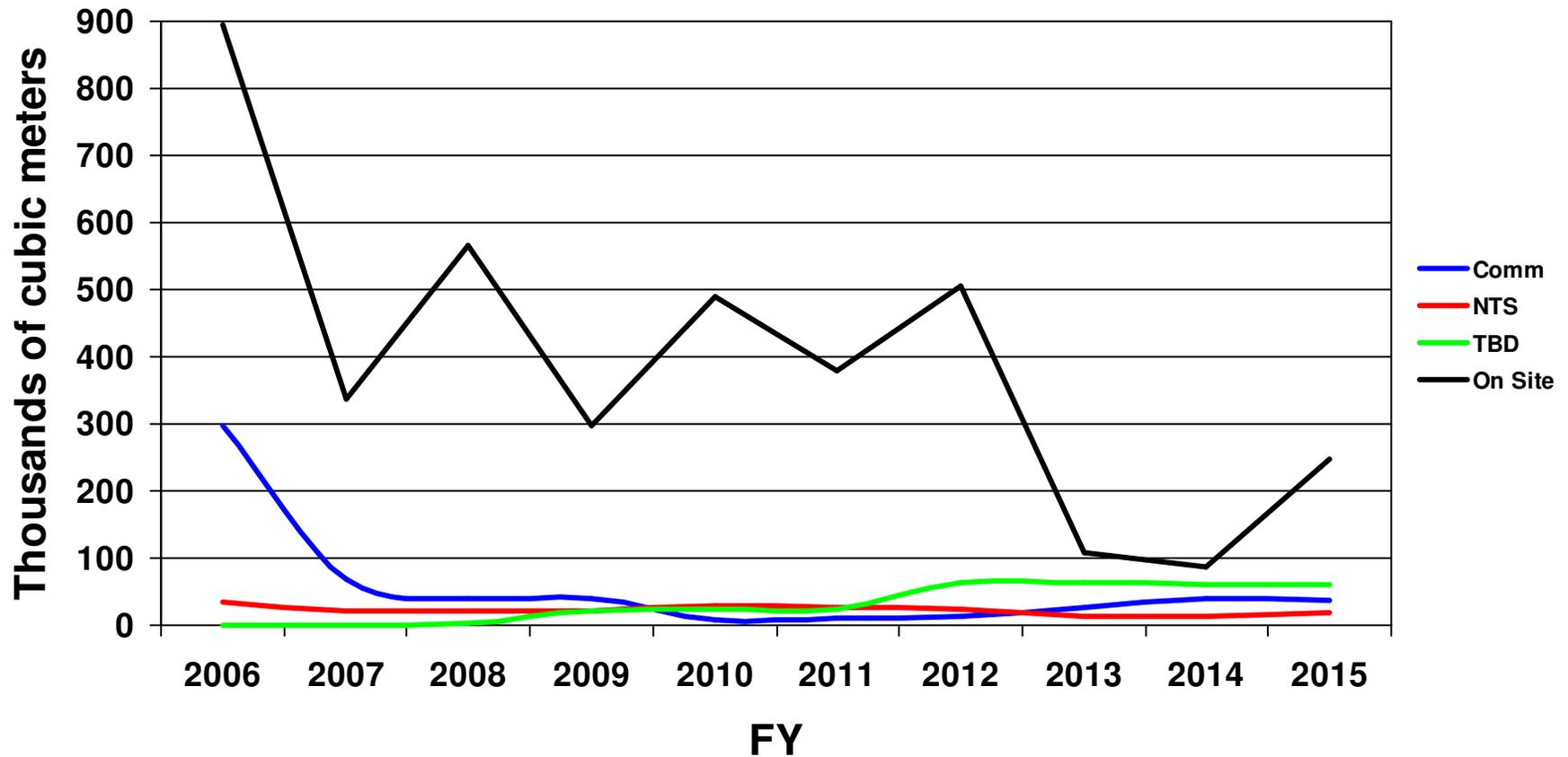
Low-Level/Mixed Low-Level Waste (LLW/MLLW)

~ Disposition Update

- Established DOE LLW Corporate Board
 - First meeting January 2008 – approved bylaws
 - Board meets approximately three times per year to identify and resolve issues and foster integration among sites
- DOE-wide life-cycle waste forecasts collected
 - Waste Information Management System (FY 07 data)
<http://wims.arc.fiu.edu/WIMS>
 - Development of more detailed disposition planning tools continues
 - Narrative summary of disposition plans
 - Disposition schedule
 - Risk mitigation plans

Off Site LLW/MLLW disposition has declined

On Site disposition follows similar trend, but at higher volumes



EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

LLW/MLLW ~Trends

- On-site disposal continues at most sites
 - Expansion of some on-site facilities underway or planned
 - New on-site facilities under evaluation for future large D&D projects
- Volumes requiring off-site waste disposal continue to drop
 - Expect trend to continue due to DOE budget constraints.
- Retention of off-site disposal options is critical, as some streams require it
- Taking steps to optimize disposal operations at DOE facilities
- Commercial disposal continues to be cost effective alternative for many lower activity debris and soil streams
- Many MLLW treatment needs are met by off-site commercial firms
- Closure of TSCA Incinerator planned in FY 2009

LLW/MLLW ~ Issues and Priorities

- Near term disposal plans will likely be constrained, and opportunities to optimize costs are critical to continued disposal progress
 - Increased emphasis of near term planning and cost-benefit analyses
 - Economies of scale are being sought
- Off-site waste shipments to Hanford remain suspended
 - Pending completion of the Hanford Tank Closure & Waste Management EIS and subsequent decisions
- DOE disposal capacity for MLLW (at NTS) ends in Nov 2010
 - Future alternatives are being evaluated, but remain uncertain
- Legal issues stand to impact general availability of NTS
- Forecast volumes remain somewhat uncertain
 - For example, some higher activity MLLW volumes “fall out” of TRU inventory

Transuranic (TRU) Waste ~ Disposition Update

- Waste Isolation Pilot Plant (WIPP) Summary
 - 56,442 m³ of defense transuranic waste disposed
 - 100,000th container disposed in April
 - Completed 6,866 shipments (over 8 million miles traveled)
- Remote-handled (RH) shipments began in January 2007
 - 171 RH shipments received to date at WIPP
- Removed legacy TRU waste from 13 sites; shipments from large generator sites continue
 - Some smaller sites' wastes were previously consolidated at large sites
 - DOE is currently planning for additional inter-site campaign
- EM strives to sustain an average of 21 contact-handled TRU (CH-TRU) and 5 remote-handled TRU (RH-TRU) shipments per week
 - Shipping rate is dependent on waste availability at generator sites
 - Annual shipping plan developed and maintained to retain complex's focus on fully utilizing the "TRU pipeline"
- Recently, waste shipments and handling operations have continued at slower rate to re-emphasize safety and strengthen conduct of operations
- TRU disposition activities are somewhat constrained at FY09 Request

TRU Shipments Received – as of 9/08/08



Site	Shipments	
Argonne National Laboratory	18	
Idaho National Laboratory	2,985	
Los Alamos National Laboratory	398	
Lawrence Livermore National Laboratory	18	
Nevada Test Site	48	
Rocky Flats Environmental Technology Site	2,045	
Hanford Site	426	
Savannah River Site	928	
Total to WIPP	6,866	

Optimizing TRU Waste Disposition ~ Plans for Inter-site Shipments to INL for Characterization and Treatment

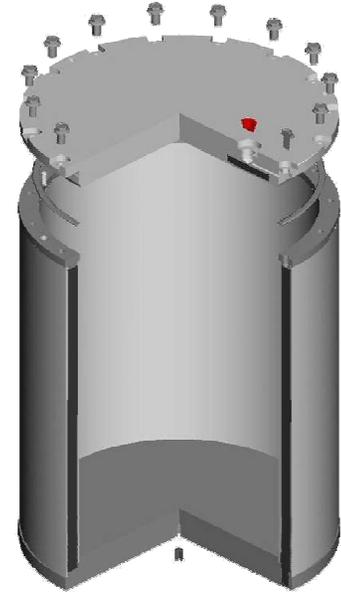
- DOE intends to send both CH and RH TRU waste to Idaho National Laboratory to be treated and characterized prior to shipment to WIPP for disposal.
- DOE completed additional NEPA analysis and published an Amended Record of Decision (ROD) in Federal Register on March 7, 2008.
- Approximately 2,067 CH-TRU shipments and 188 RH-TRU shipments could move to INL for treatment and characterization
- Approximately 795 shipments of CH TRU and 621 of RH TRU would then require transport to WIPP for disposal
- Planning for inter-site shipment campaign is still underway; implementation details not yet available
 - However, DOE will continue to comply with the Idaho Settlement Agreement terms and milestones
 - Waste must be treated within 6 months of arrival, outbound within 6 months of treatment, characterization
 - Implementation targeted to begin in late 2008, during planned outage at WIPP

Inter-site TRU Shipments to INL

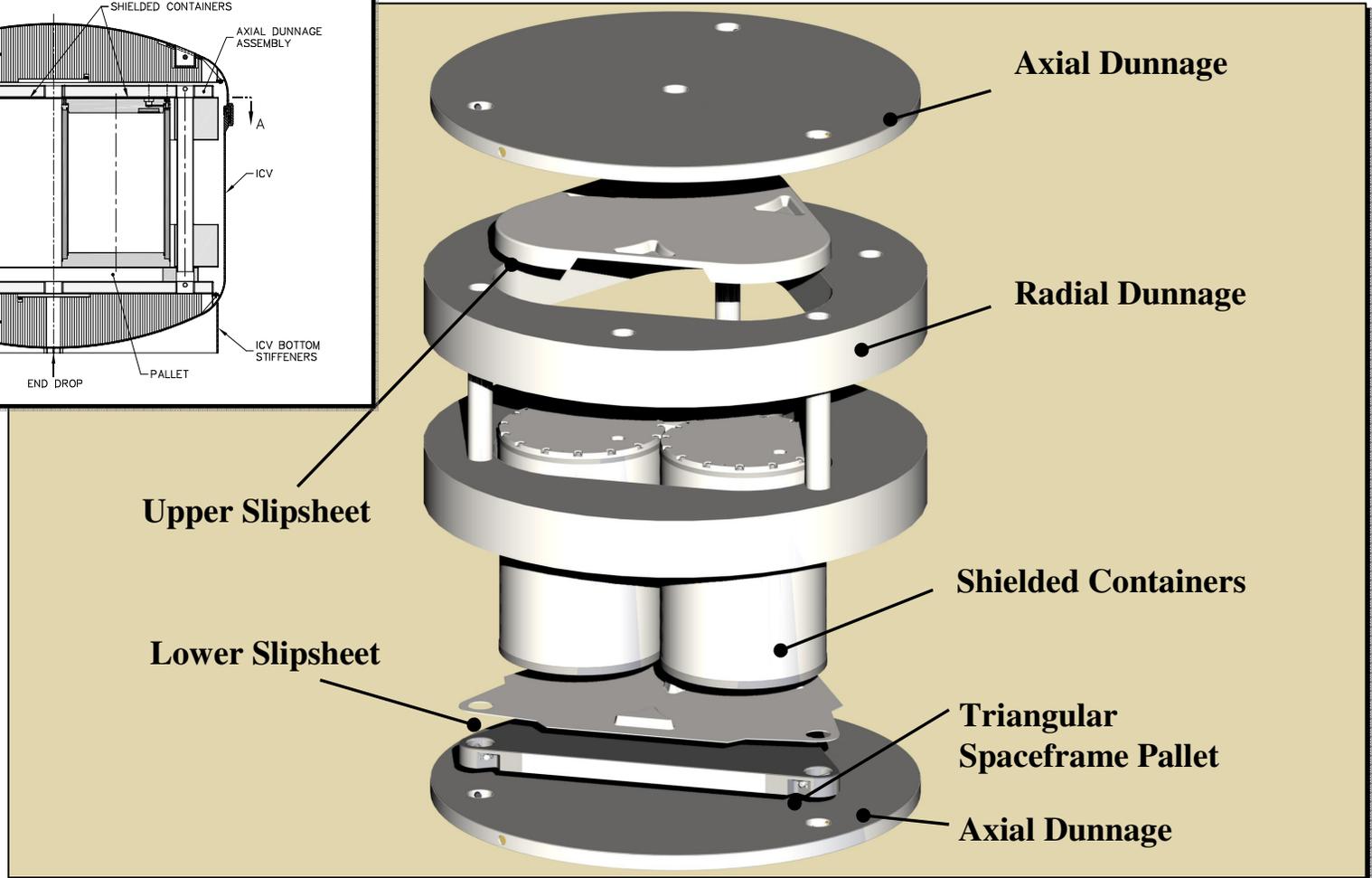
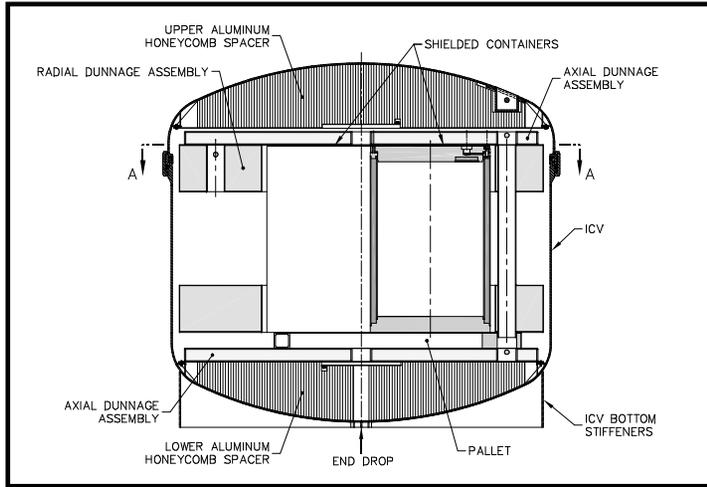
- Generator/Shipping Sites:
 - Hanford Site (Richland, WA)
 - Nevada Test Site
 - Lawrence Berkeley National Laboratory (Berkeley, CA)
 - Lawrence Livermore National Laboratory (Livermore, CA)
 - GE Vallecitos Nuclear Center (Sunol, CA)
 - Argonne National Laboratory (Argonne, IL)
 - Knolls Atomic Power Laboratory (Schenectady, NY)
 - Separations Process Research Unit (SPRU) (Schenectady, NY)
 - Paducah Gaseous Diffusion Plant (Paducah, KY)
 - Knolls Atomic Power Laboratory (Nuclear Fuel Services) (Erwin, TN)
 - Bettis Atomic Power Laboratory (West Mifflin, PA)
 - Sandia National Laboratory (Albuquerque, NM)

Shielded Containers - A new method to ship RH waste to WIPP

- External dimensions = 55-gal drum, internal capacity for a standard 30-gallon drum
- Transport in 3-pack configuration in HalfPACT under current design and licensing bases:
- Handling, storage, and emplacement in 3-pack configuration
- Incorporate into existing CH TRU waste handling infrastructure – count as RH waste
- Shielded containers will significantly reduce the number of RH waste shipments to WIPP



Shipping Configuration

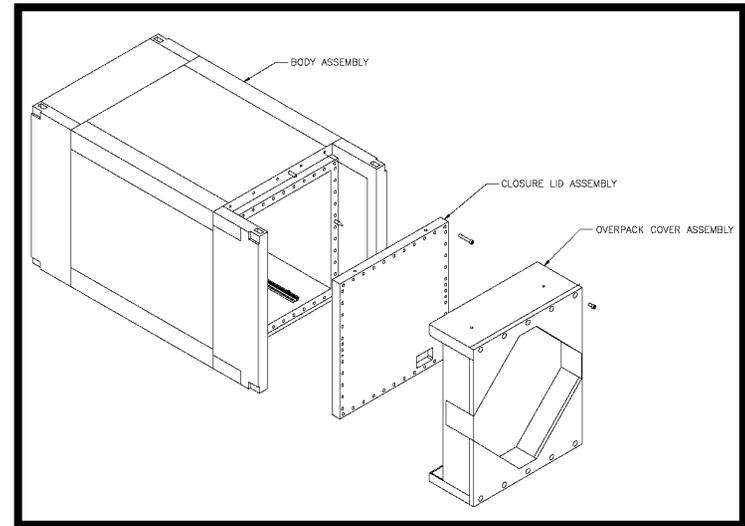


Radial Shock Absorber



TRUPACT-III

- Rectangular transportation container
 - 8'2 x 8'8"x 19'.10.5" integrated shell with 5 different layers- high strength stainless
 - For use with large box waste to eliminate repackaging
 - Approximately 25% of DOE TRU waste in large boxes
 - Must meet NRC Type B requirements
 - NRC currently reviewing application



High-Level/Liquid Tank Waste Management

~ Program Overview

- Liquid waste management activities comprise nearly one third of the EM annual budget
 - Efforts span a wide range of activities, including: scientific analysis, design & engineering, R&D, technology development, tank farm operations, treatment facility construction, treatment and disposition operations
- Tank retrieval progress continues
- Implementation of “Section 3116” authorities continues at Idaho and Savannah River Site (SRS)
 - Allows residual waste (tank heels) to be left in place and managed to meet LLW requirements
 - Permits separated and treated low-activity waste to be disposed on site
 - Tank closures achieved at Idaho and SRS
- Facility construction continues
 - Waste Treatment Plant and related facilities at Hanford
 - Integrated Waste Treatment Unit at Idaho for Sodium Bearing Waste
 - Salt Waste Processing Facility at SRS
- Alternative evaluation and regulatory analysis underway for calcined HLW

High-Level/Liquid Tank Waste Management ~ Update

- HLW Corporate Board established; first meeting held April 1st
 - “The Board will identify need for and develop policies, planning, standards and guidance and provide the integration necessary to implement an effective and efficient national HLW program”
 - “The Board will also evaluate the implications of HLW issues and their potential impact across the complex and recommend solutions”
- Corporate issues:
 - Need to better document and understand tank inventory
 - Tank farm integrity, operability, life extension.
 - Effectiveness of different pre-treatment technologies
 - Tank residual goals – to be driven by performance assessment
 - Waste determination technical issues
 - Strategy for disposal of hazardous waste forms in repository
- Coordination with Office of Civilian Radioactive Waste Management continues to ensure DOE HLW adequately addressed in repository NEPA analyses and license application
- Actively reviewing and revising EM HLW-related standards and guidance to reflect new information, support current activities and align with repository requirements

Office of Compliance Update



EM ***Environmental Management***

safety ❖ performance ❖ cleanup ❖ closure

EM-10's Proposed/Planned Initiatives

- Update the “Complex-Wide Review”
- Update DOE Order 435.1, *Radioactive Waste Management*
- Revisit Low Level Waste Federal Review Group (LFRG) Roles and Responsibilities
- Create Performance Assessment Task Team
 - Address PA Consistency Issues
 - Address Guidance Needs

Update Complex-Wide Review of Waste Management Programs

- Over 10 years old
- Previous focused on needs and vulnerabilities
- Today's message very positive and should be told
- Still opportunities for improvements that need to be captured

Update 435.1

- 10 years of implementation lessons learned
- New issues and opportunities
 - 3116 vs. WIR
 - Former EM roles going to other Programs (NE, NNSA)

Revisit LFRG Roles and Responsibilities

- LFRG like the “Rotary Club”
- LFRG mandate for technical review after analysis is complete
- LFRG supporting *ad hoc* activities
 - Workshop on probabilistic modeling
 - LFRG review criteria updated to address consistency
 - Scoping efforts

Create Performance Assessment (PA) Task Team

- Reduce regulatory and technical risks related to PA implementation
- Improve the quality, credibility, consistency, and efficiency of DOE's PA and risk-based decision-making
- Maintain enduring performance and risk assessment capability and knowledge base for DOE Complex

Proposed PAAT Roles

- Provide on-site scoping assistance on new PAs
- Develop standard template for scoping PA
- Participate on modeling consistency groups
- Develop guidance/provide support on specific technical topics
- Provide training and lessons learned forums
- Develop structured repository of data and modeling approaches
- Maintain a roster of subject matter experts

GTCC LLW Disposal EIS



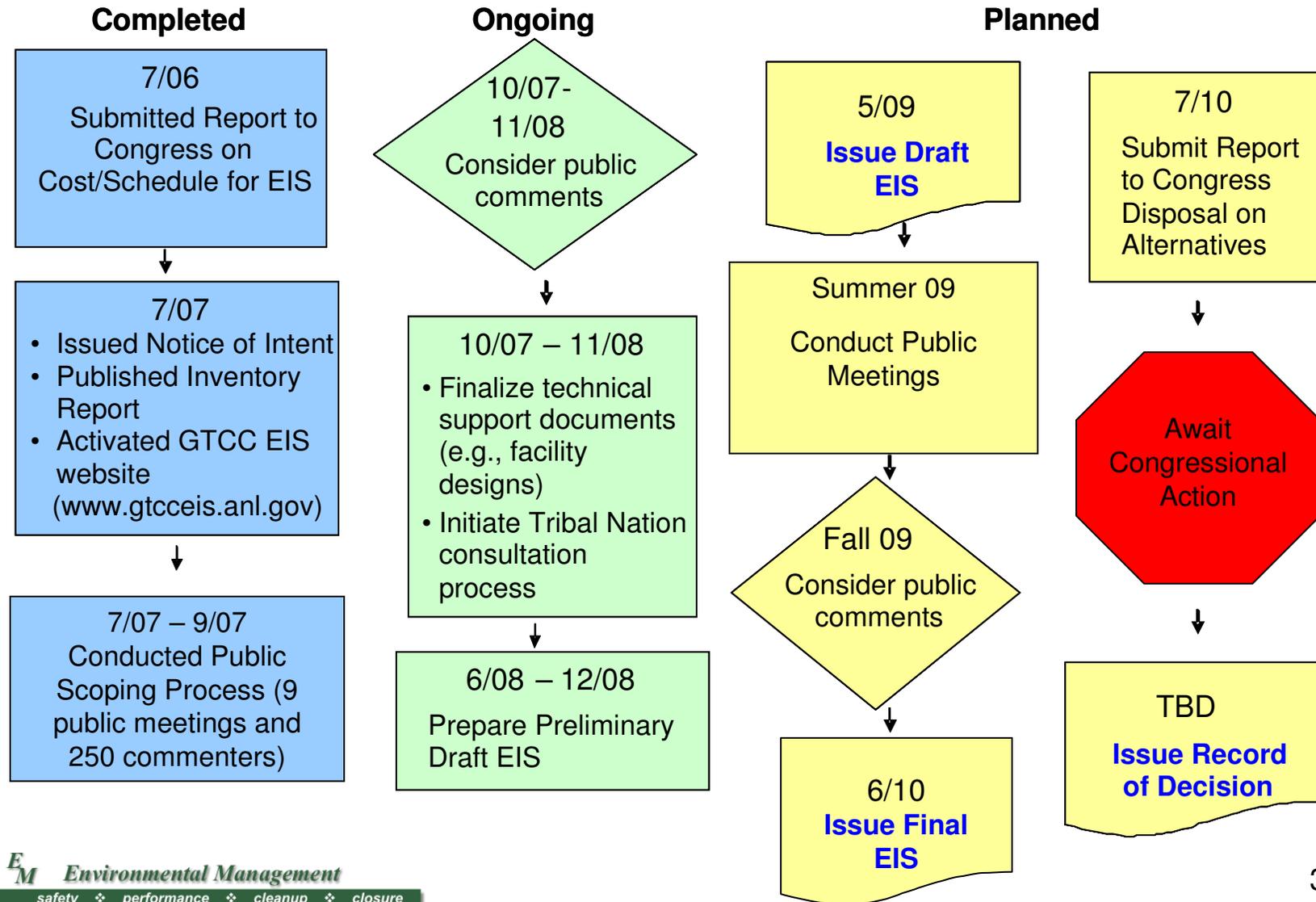
EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

Update on the GTCC LLW Disposal EIS

- The Low-Level Radioactive Waste Policy Act Amendments of 1985 assigned the Federal Government [DOE] the responsibility to develop disposal capacity for Greater-Than-Class C (GTCC) Low-Level Radioactive Waste (LLRW)
- The Energy Policy Act (EPAAct) of 2005 required DOE to provide a report on the estimated cost and schedule to develop an environmental impact statement on GTCC LLRW disposal
 - Report to Congress submitted in July 2006
 - Also requires submission of a second Report to Congress on disposal alternatives and action by Congress before Record of Decision (ROD) can be issued

Status of GTCC EIS Activities



Disposal Alternatives for EIS Evaluation

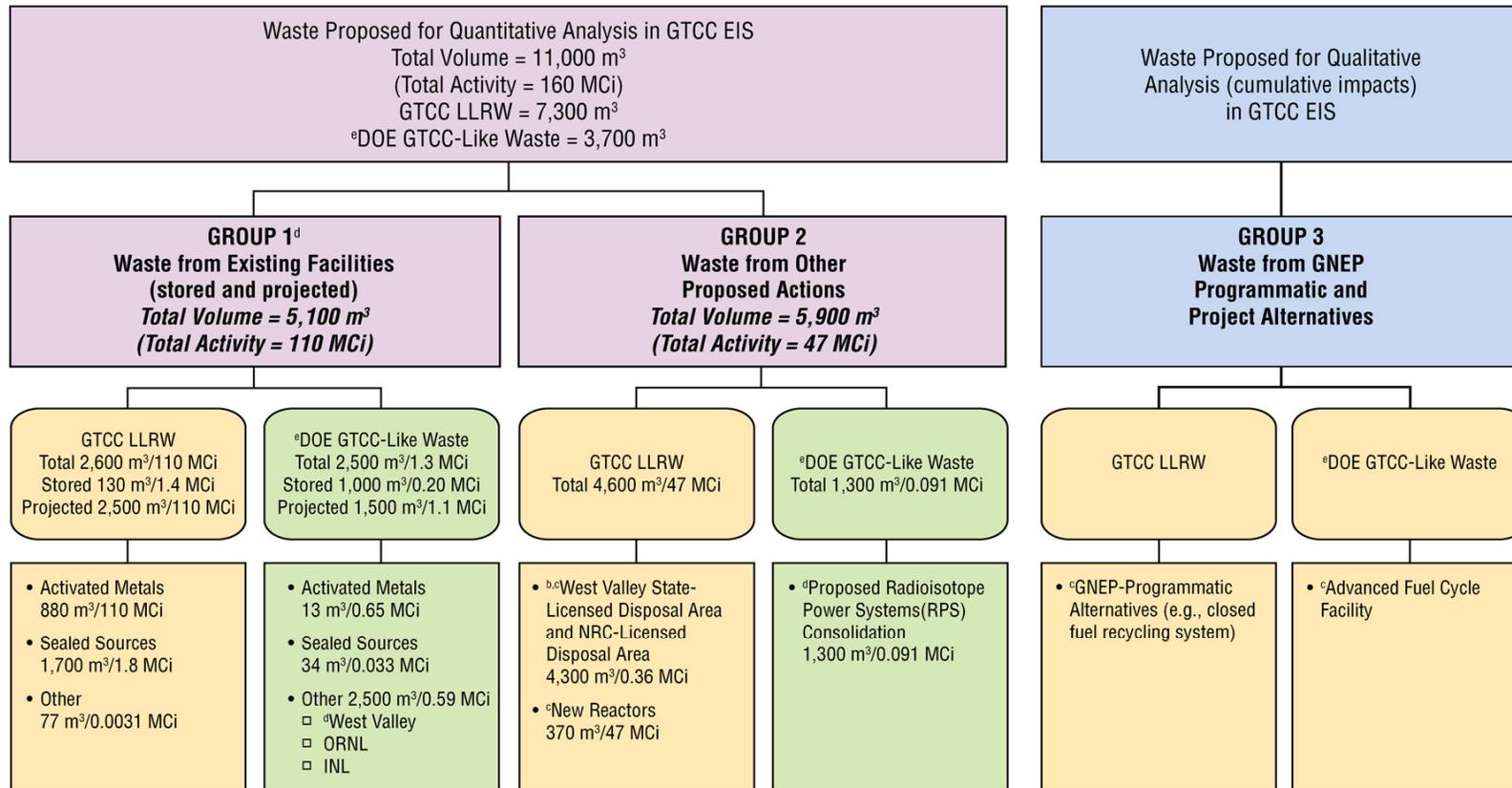
Alternative	Location
1. No action	Continued storage consistent with ongoing practices
2. Geologic Repository	Waste Isolation Pilot Plant (WIPP)
3. Geologic Repository	Proposed Yucca Mountain Repository
4. Enhanced Near Surface	Hanford, Idaho National Laboratory (INL), Los Alamos National Laboratory (LANL), Nevada Test Site (NTS), Oak Ridge Reservation (ORR), Savannah River Site (SRS), WIPP Vicinity, and generic commercial
5. Intermediate Depth Borehole	Hanford Site, INL, LANL, NTS, WIPP Vicinity, and generic commercial

Remarks

- EIS will identify whether legislation or regulatory modifications that may be needed to implement any of these alternatives
- Combination of alternatives may be feasible
- EIS being structured so that decisions can be made on a waste stream-by-waste stream basis

Preliminary Waste Inventory for EIS Analysis

Waste Volumes and Radionuclide Activities for Inclusion In GTCC EIS^a



MP20801E

^a Values have been rounded to two significant figures; volume estimates represent packaged waste volumes.

^b The packaged waste volume given here is based on a packaging factor of 1.02 applied to in-place GTCC LLRW estimate.

^c Waste volumes not included in the estimates provided in the Notice of Intent (NOI) to prepare the EIS.

^d RPS waste was identified in the NOI as DOE GTCC-like waste and is now shown in Group 2. Also, 810 m³ from the West Valley Site was added to the original NOI estimate and included in Group 1.

^e GTCC-Like Waste refers to DOE LLRW and transuranic waste with characteristics similar to GTCC LLRW and which may not have an identified path to disposal. The term GTCC-like does not have the effect or intent of creating a new classification of radioactive waste.

**Waste Volumes
 may be subject
 to change**

Extensive coordination required

- EPA Cooperating Agency; NRC Commenting Agency
- Tribal Nations (formal consultation process being developed)
- Industry (waste inventory and operating experience)
- Other Stakeholders
- Other DOE EISs
 - Yucca Mountain Final Supplemental EISs
 - GNEP Programmatic EIS
 - Nevada Test Site
 - Hanford Tank Closure & Waste Management EIS
 - West Valley Decommissioning EIS
 - LANL Site Wide EIS
 - Complex Transformation Supplemental Programmatic EIS

Summing up GTCC LLW EIS

- Preparation of EIS in full scale production
- Waste inventory developed but subject to change
- Public scoping comments received and are being considered
- Additional opportunity to comment on Draft EIS (mid 09)
- High level of internal and external coordination
- Action by Congress required before disposal decision

For additional information on the GTCC EIS visit <http://www.gtcceis.anl.gov/>

DOE's Integrated Nickel Disposition Project



EM Environmental Management

safety ❖ performance ❖ cleanup ❖ closure

Background

- DOE is evaluating disposition of ~**15,300** tons of classified nickel* recovered from uranium enrichment process equipment



each ingot is 24"-25" tall, 16"-19" in diameter, weight ~1 U.S. ton.

9,700 tons of nickel ingots located in Paducah

5,600 tons of shredded nickel scrap located in Oak Ridge
(photo not available)

*Both inventories are contaminated with uranium and trace quantities of technetium, neptunium, and plutonium

- DOE plans to pursue a strategy to competitively sell the nickel to a qualified bidder that will 1) resize, 2) decontaminate, and 3) alloy, fabricate, then manufacture the nickel into a product that can be used in a radiologically-controlled (or licensed) process
 - Nickel would remain within a controlled environment throughout the disposition process; it will **not** be “released” into unrestricted commerce

Overview of Nickel Disposition Strategy

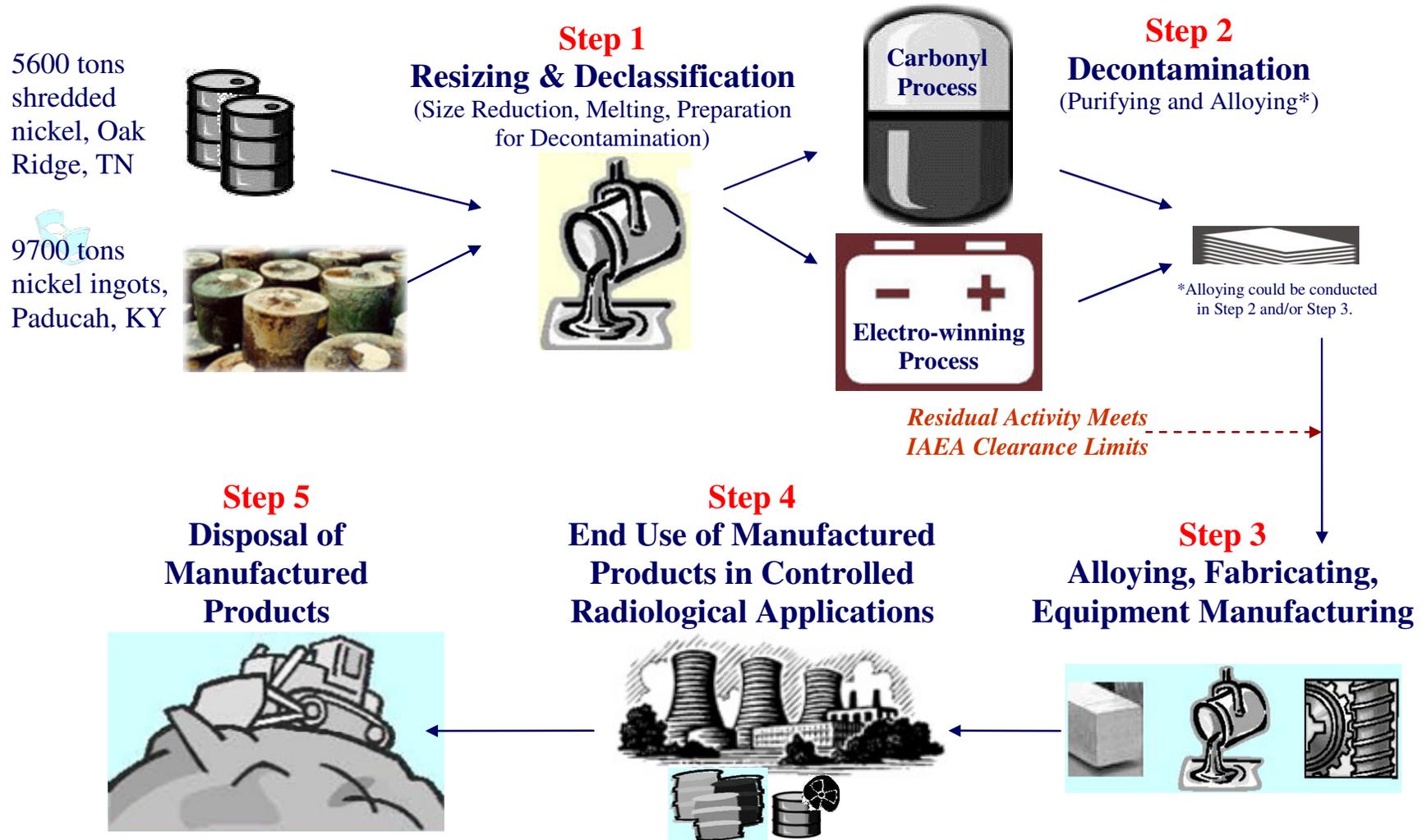
- At the time of delivery, the buyer must have all necessary permits, licenses and/or approvals and comply with the law
- Nickel must be resized and decontaminated by a primary metal processing or alloying company which must be licensed by the NRC or an Agreement State, or under the AEA authority
- Stringent “defense in depth” requirement must be met: decontaminated nickel will meet IAEA clearance levels for unrestricted release of material
 - This will ensure radiation doses and environmental impacts are kept as low as reasonably achievable, should planned controls fail

Overview of Nickel Disposition Strategy (cont'd)

- **Regulatory controls on the follow-on alloying, fabrication, and/or equipment manufacturing of the nickel (or nickel alloy) will likely be required**
- **Cradle-to-Grave control will be maintained and documented throughout the disposition process**
 - Inventory and chain-of-custody control must be in place for reporting, tracking, verification, and enforcement
 - After its intended use, final product will be disposed

These controls are recommended in light of stakeholders and industry concerns.

Simplified Material Flow



Public input was needed - to inform DOE's path forward

- **A Request for Expressions of Interest (EOI) was issued on March 9, 2007 and received technical input from industry on disposition of the nickel**
- **A draft Environmental Assessment was issued on June 13, 2008 for public input on the analysis**
 - The National Environmental Policy Act (NEPA) requires Federal agencies to consider environmental impacts of the proposed action and alternatives to those actions in decision-making processes
 - DOE's plan to pursue disposition of the nickel required NEPA evaluation

The EA analyzes environmental impacts of the proposed action and alternatives. It does not result in specific decisions on strategy implementation.

Summary of the Draft EA

- **Alternatives under Consideration:**
 - **Proposed Action:**
Sell the DOE nickel for Controlled Radiological Use
 - **Disposal as Radioactive Waste:**
Disposal in a classified low-level radioactive waste landfill (or declassify the nickel, then dispose of it in an unclassified landfill)
 - **No-Action Alternative :**
Continue storage at Paducah, KY and Oak Ridge, TN
- **Evaluates impacts of the industrial processes at:**
 - **Paducah, Kentucky, Oak Ridge, Tennessee, Generic industrial location, or a Combination of the above**

Preliminary Conclusion:

Minimal adverse impacts for implementation of any alternative

Public Comments on the Draft EA

- **NEPA public comment period ended August 15, 2008**
- **Approx. 150 comment letters received, including many duplicates**
- **Comments include:**
 - Support from industry and local communities
 - Concern from citizens and environmental groups regarding the government's ability to effectively implement the required controls, including, but not limited to, the final use of the manufactured products
 - Technical input to improve the analysis in the EA
- **Comment resolution is in progress**
 - Preliminary review of the comments indicates that the EA may not require extensive revision

Next Steps in Nickel Disposition Plan

Preliminary schedule
subject to change

- **Obtain DOE senior management approval to pursue implementation** – Fall 2008
- **Finalize EA** – Fall 2008
- **Address key policy issues on management of proceeds realized through sale** – Fall 2008

If strategy approved:

- **Issue draft solicitation for industry review** – December 2008
- **Finalize solicitation and pursue sale** – Summer 2009
- **Evaluate bids and make award** – Fall 2009
 - Complete further NEPA analysis, if required

Other topics...

Questions?



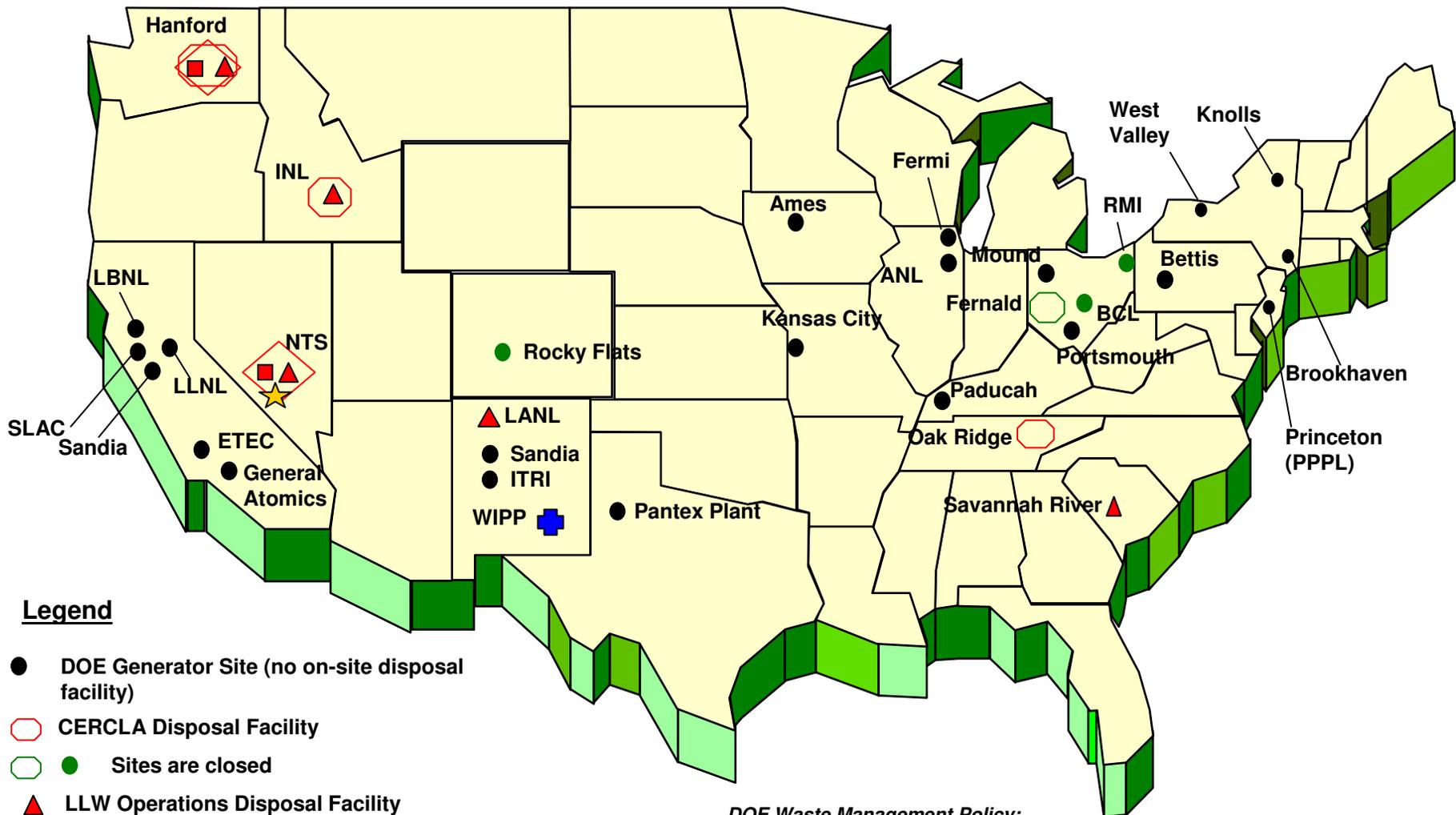
Background slides

DOE Order 435.1, Radioactive Waste Management, Establishes Policy & Framework for Waste Disposition Activities*

- HLW and SNF
 - Stabilization, immobilization/treatment if necessary, and safe interim site storage until geologic disposal is available
- TRU Waste
 - If defense, dispose at Waste Isolation Pilot Plant (WIPP)
 - If defense determination pending, safe storage awaiting future disposition
- LLW/MLLW
 - If practical, disposal on the site where generated
 - If on-site disposal not available, at another DOE disposal Facility
 - At commercial disposal facilities if compliant, cost effective, and in the best interest of DOE

* Other documents define plan for interim management of special nuclear materials (SNM); excess SNM disposal plans are integrated with waste plans

DOE's Complex ~ Waste Management View



Legend

- DOE Generator Site (no on-site disposal facility)
- CERCLA Disposal Facility
- Sites are closed
- ▲ LLW Operations Disposal Facility
- MLLW Operations Disposal Facility
- ◇ Regional LLW Disposal Facility
- ⊕ Waste Isolation Pilot Plant (WIPP) for TRU disposal
- ★ Yucca Mountain Repository for HLW/SNF Disposal

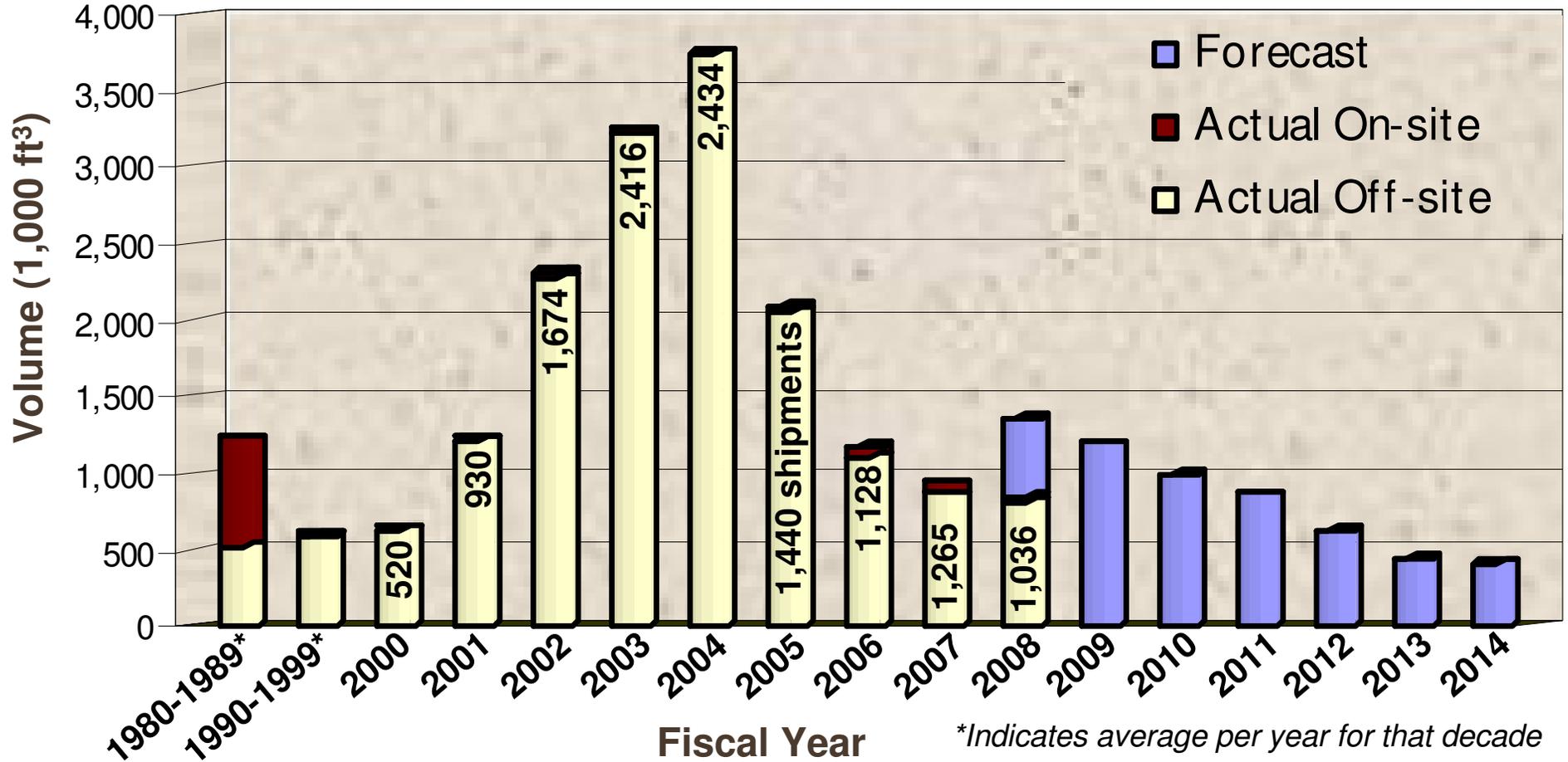
DOE Waste Management Policy:

LLW and MLLW: If practical, disposal on the site at which it is generated. If on-site disposal not available, at another DOE disposal facility. At commercial disposal facilities if compliant, cost effective, and in best interest of the Department

TRU waste: If defense, disposed at Waste Isolation Pilot Plant, New Mexico. If non-defense, safe storage awaiting future disposition

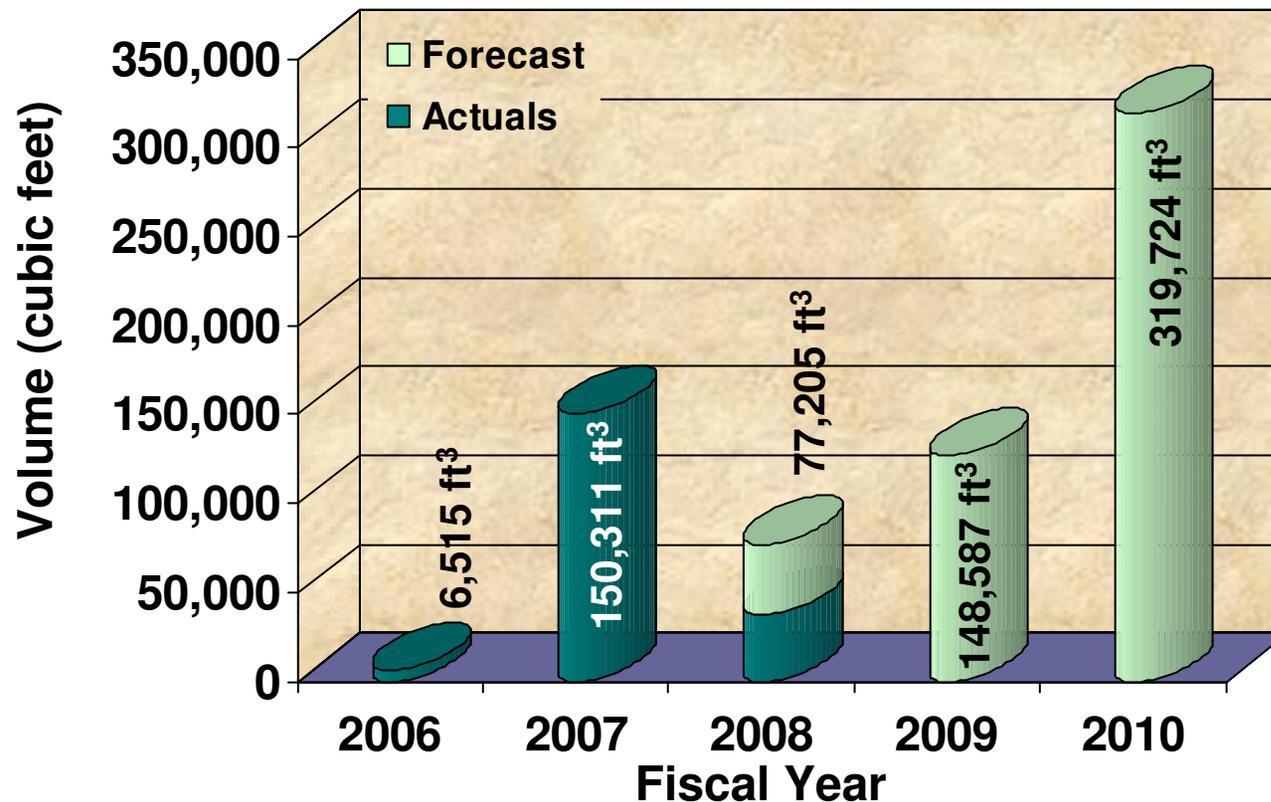
HLW and SNF: Stabilization, if necessary, and safe storage until geologic disposal is available

NTS LLW/Mixed LLW Disposal Volumes



NTS LLW 2008-2014 Disposal Forecast – 5,667,898 ft³
 NTS Mixed LLW 2008-2010 Disposal Forecast – 545,516 ft³

NTS Mixed LLW Volume History



5-year
forecasted
total is
702,342 ft³
(19,888 m³)
– 99 percent
of the
available
capacity

Mixed LLW volume capacity remaining* in Pit 3 is 512,394 ft³

*As of August 24, 2008

EM's waste and materials disposition scope is significant

- Liquid tank waste (HLW and “low activity waste”) and other HLW streams
 - 88 million gallons of liquid waste, stored in over 200 tanks
 - Also, calcined HLW and cesium and strontium capsules
- Transuranic (TRU) waste
 - ~157,000 m³ legacy wastes managed as TRU waste
 - Future TRU will be generated by DOE mission activities
- Low-Level Waste and Mixed Low-Level Waste (LLW/MLLW)
 - Majority of legacy wastes disposed – over 1 million m³ disposed to date
 - DOE mission activities and EM cleanup generate LLW/MLLW wastes
- DOE owned and managed spent nuclear fuel (SNF)
- EM managed surplus nuclear materials



Enough nuclear waste to fill the Beijing National Olympic Stadium

What is GTCC LLRW?

- Most hazardous of the four commercial classes of LLRW:
 - Class A, B, and C LLRW can be disposed of in near surface facilities
 - The U.S. Nuclear Regulatory Commission (NRC) requires GTCC LLRW to be disposed of in a geologic repository licensed by NRC unless alternative method(s) of disposal are proposed to and approved by NRC
- Major waste types:
 - Activated metals from the decommissioning of nuclear power plants
 - Sealed sources used in the construction, medical, industrial and other sectors
 - Other waste (e.g., contaminated equipment and debris from laboratory research)
- Also included in the GTCC EIS scope is DOE generated waste similar to GTCC LLRW that may not have a potential path to disposal, e.g., non-defense transuranic (TRU) waste

Nickel Disposition Decision Logic Flow

