



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
ENVIRONMENTAL
MANAGEMENT

Update on WIPP, Tank Waste and Other Waste Disposition

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EM SSAB Chairs Fall Meeting – Idaho Falls, ID
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Discussion Topics

- WIPP Recovery Update
- EM Waste Disposition Updates by Site
- Tank Waste Update
- LLW/MLLW Disposal Update
- Waste Disposition Map Planning

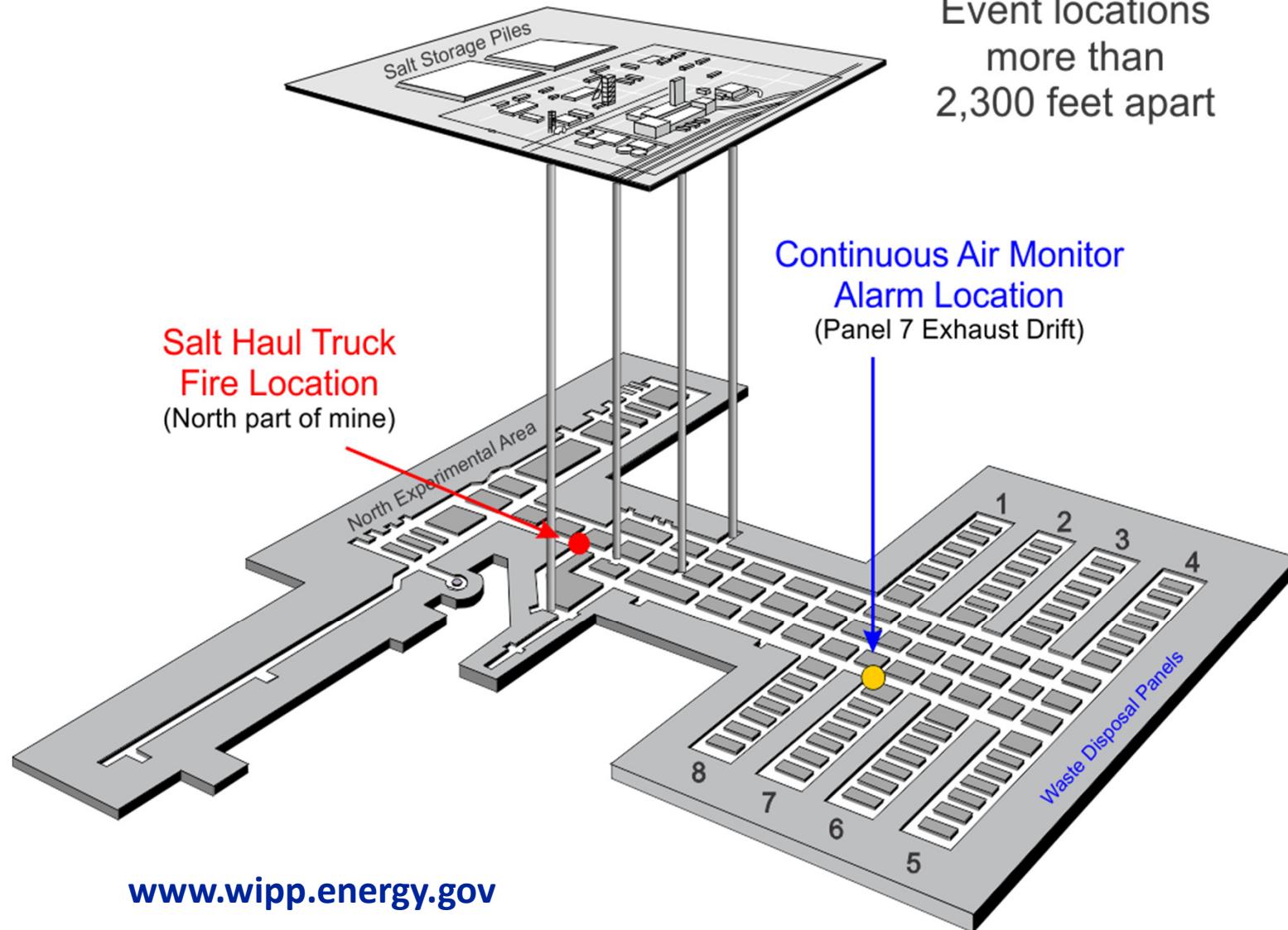
February 5th Truck Fire:

- All operations at the repository ceased following salt haul truck fire in the WIPP underground.
- An investigation team was deployed to determine the cause of the fire.
 - Report released March 13th.

February 14th Radiological Incident:

- A continuous air monitor detected airborne radiation in the underground.
- WIPP's ventilation system automatically switched to high-efficiency particulate air (HEPA) filtration mode when airborne radiation was detected underground and the WIPP mine remains in filtration mode at this time.
- Extensive sampling and monitoring conducted by DOE, New Mexico, and Carlsbad Environmental Monitoring Research Center Monitoring.
 - EPA and the NMED also performed sampling.
- Efforts by the DOE and Nuclear Waste Partnership are ensuring workers are fully protected during recovery and restart.
- Semi-monthly town hall meetings are utilized to keep the community informed; to stay apprised go to: <http://www.wipp.energy.gov>
 - Live streaming of the meetings can be viewed at: <http://new.livestream.com/rrv/>

Recap of the Incidents: Layout of the WIPP Underground



Recap of the Incidents (cont.)



**Salt Truck Fire in WIPP
Underground**

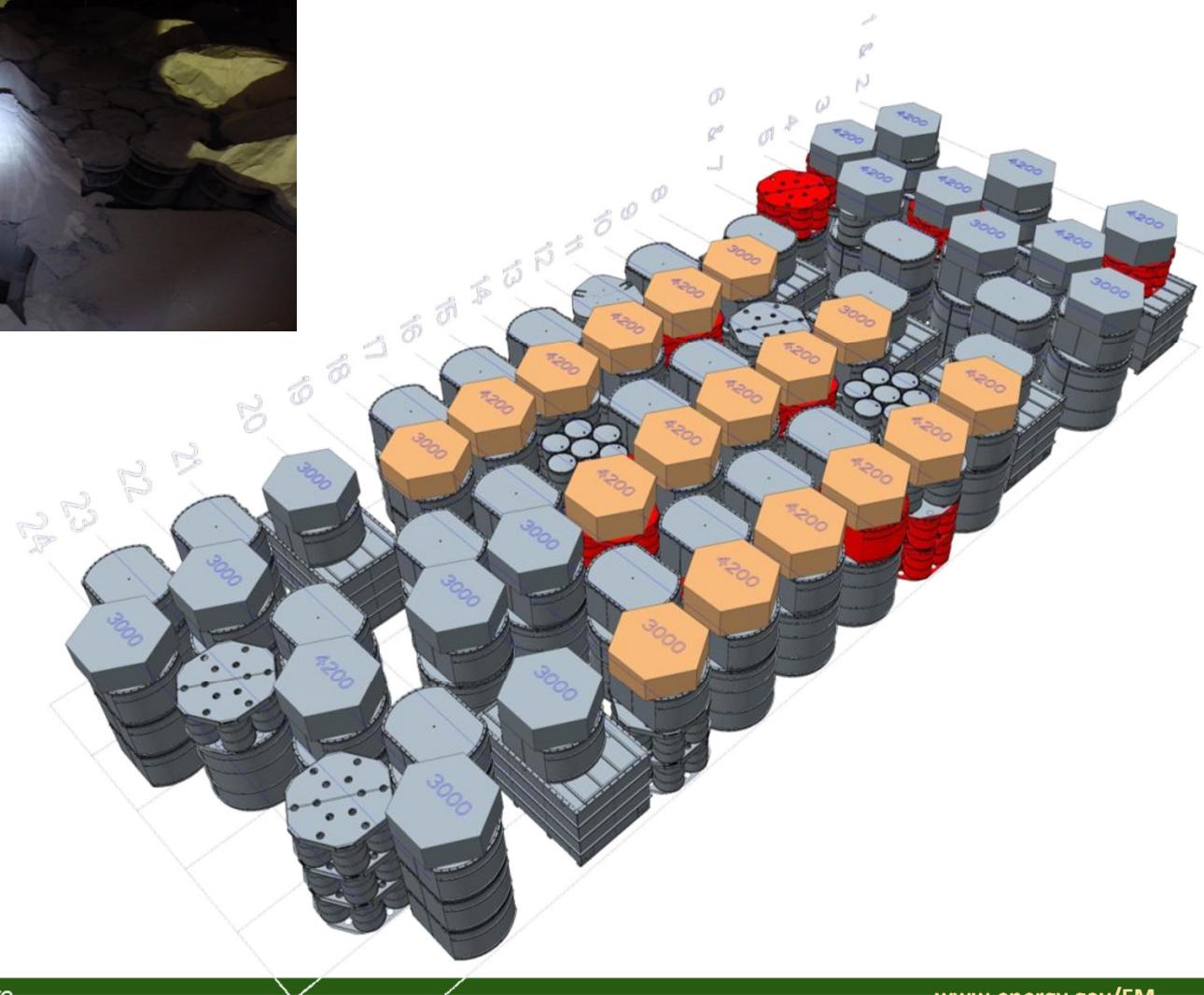


**Breached Drum in WIPP
Underground**

Accident Investigation Board

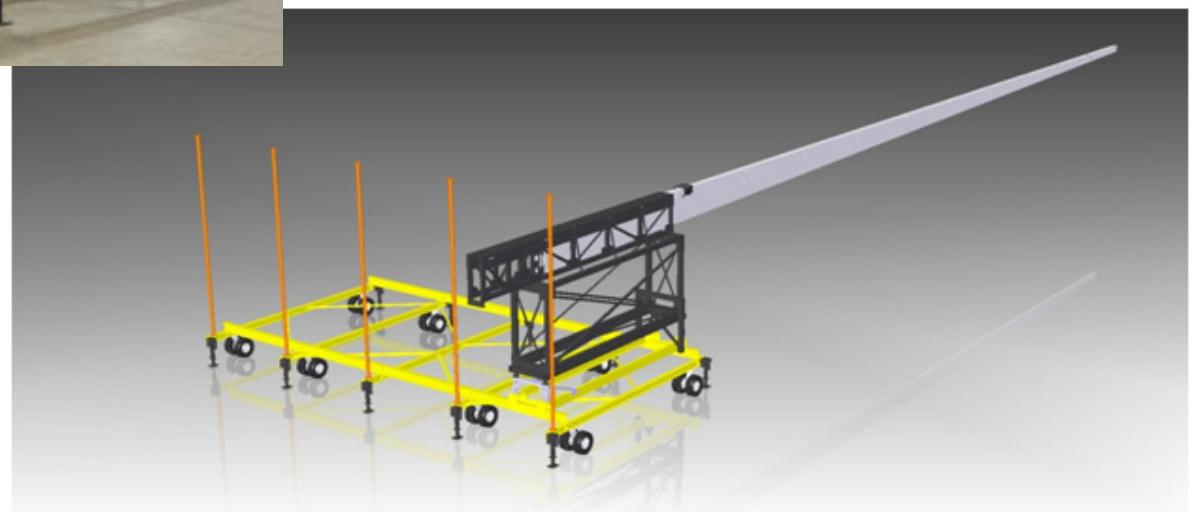
- The Accident Investigation Board (AIB) was appointed to:
 - Perform an Accident Investigation into:
 - The truck fire that occurred on February 5, 2014 at WIPP.
 - The radiological release that occurred on February 14, 2014 at WIPP.
 - Prepare investigation reports on each incident in accordance with DOE Order 225.1B, *Accident Investigations*.
 - Analyze and identify the contributing causes, root causes, and the Judgment of Need.

Room 7, Panel 7



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Project REACH



Key Recovery Steps toward Resumption of Operations

- Nuclear Safety Document Revisions (continuing)
- Safety Management Program Revitalization (continuing)
- Underground restoration (initiated)
 - Radiological Roll-back, Re-Establish Safety Systems, Cleanup, Habitability, Fire Protection, Maintenance and Ground Control
- Expedited Panel 6 and Room 7, Panel 7 Closure
- Interim Ventilation Modifications (procurement underway)
- Expedite mine stability (resume bolting)
- Supplemental Ventilation Modifications (initiated)
- Readiness Activities
- Limited Operations
 - On-site waste
 - Off-site waste generators



Recovery Status

- We have a comprehensive recovery plan that puts safety first and answers the following questions:
 - What are we doing?
 - How will we do it?
 - How much will it cost and when can it be accomplished?
- We have begun recovery and are making good progress
 - Extensive underground radiological rollback
 - Mine structure evaluation ongoing
 - Panel 6 and Panel 7, Room 7 closure preparations
- We need all of our current workforce
 - All functions working on the critical path
 - Disruptions will produce significant morale problems
- We will continue to communicate often and transparently throughout this process

National TRU Program Status

- The TRU waste-generating sites continue to characterize and certify TRU waste for eventual shipment to WIPP.
- EM is carefully evaluating the impacts to other DOE TRU waste-generating sites including impacts on commitments with state regulators.
 - Impact to the TRU waste-generator sites will depend on the length of the shutdown and available funding.
- Sites are actively working to implement strategies to minimize impacts
 - Workshop held earlier this month to share experiences and lessons
- We are working closely with these sites to identify storage requirements and funding needs beyond those provided in the DOE FY 2015 budget request.
 - These efforts will ensure that adequate storage is available for certified waste until such time shipments to WIPP resume.

- EM has initiated a HQs-led TRU Waste Management Assessment to evaluate the generator site programs for treatment and characterization of TRU waste to ensure no unidentified vulnerabilities exist – similar to those associated with the breached drum
- Implementing broad corrective actions
- Approve, implement and share the WIPP Recovery Plan
- **WIPP will reopen with the highest levels of safety**
- Sequence of future shipments will be determined as recovery progresses and consider compliance, risk and other factors

Waste Disposition Updates by Site

Idaho

- Completed targeted exhumation at Accelerated Retrieval Project (ARP) VII and III
 - Exhumations now complete at 7 of 9 ARPs (3.28 out of a total of 5.69 acres)
 - Exhumations ongoing at ARP VIII
- Completed two-year project to treat, characterize, and repackage 6,000 drums of legacy TRU and MLLW sludge from AMWTP
- Started sodium distillation system to treat challenging reactive sodium remote-handled wastes
- Completed Readiness Assessments for Integrated Waste Treatment Unit
 - Simulant testing will soon begin to support start of radioactive waste treatment



Targeted Waste Exhumations at Accelerated Retrieval Project VIII facility



Integrated Waste Treatment Unit Facility

Oak Ridge

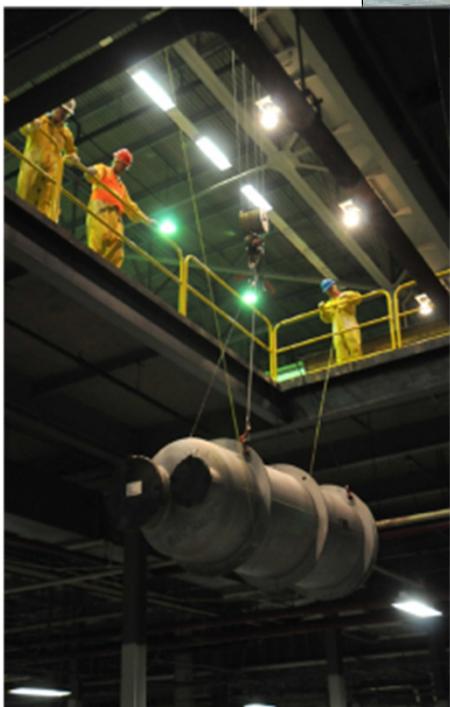
- K-25 final phase demolition and waste disposal completed
- Increased focus on mercury cleanup at Y-12; completed conceptual design for new treatment facility
- CH TRU processing activities continue at TRU Waste Processing Center
- Evaluating options to mitigate impacts from inability to ship TRU offsite



Portsmouth/Paducah

Paducah

C-410 Feed Plant building demolition began in May and will be completed this fall



Portsmouth

Cut & Cap at X-326 Process Building: More than 80 cell equivalents removed; more than 1,100 converters shipped



DUF6

20,459 metric tons DUF6 processed (>double FY2012 total) and 3,067,061 gallons hydrofluoric acid safely shipped in through August in FY 2014

Hanford

- Disposed 15.6 million tons of contaminated material at the Environmental Restoration Disposal Facility since 1996, including recent disposal of the Plutonium Recycle Test Reactor
- Continuing construction activities for system to retrieve, package, and transport highly radioactive sludge from the K-West Basin for interim storage away from the Columbia River
- Plutonium Finishing Plant glove box removal nearing completion
- Completed the cleanout and demolition of B Reactor's 183-B Clearwell support facility, an old water treatment building, in 100 Area
- Removed source of chromium contamination to the Columbia River near Hanford's D Reactor after workers excavated 2.2 million tons of material from waste sites
- Exceeded its annual goal for removing hexavalent chromium from groundwater four months ahead of schedule
- Removed or demolished 8 buildings surrounding the Plutonium Finishing Plant



Construction of K-West Basin Annex for sludge retrieval project



1,082-ton packaged PRTR being transported to ERDF for disposal

Savannah River

- Reduced legacy CH-TRU stored down to 600 cubic meters from over 12,000 cubic meters
- Planning for transfer of lessons learned and equipment for use of TRUPACT-III at other sites
- E-Area Waste Management Facilities continue safe operation
- Continuing production of HLW canisters at the Defense Waste Processing Facility (over 3,700 since 1996)
- Continuing construction of the Salt Waste Processing Facility
- SRNL celebrated 10 years as a national lab



Savannah River

- Completed processing of potentially vulnerable fuel (Sodium Reactor Experiment fuel) in H-Canyon – August 2014
- In accordance with March 2013 Record of Decision, initiated processing of aluminum-clad fuel in H-Canyon – September 2014
 - Generates extra storage capacity in L-Basin to support FRR and DRR receipts
 - Non-proliferation benefits by converting separated HEU to LEU for use in commercial reactors
 - Produce up to 40 MT of LEU



Savannah River

- DOE considering possible acceptance and disposition of German pebbled bed research reactor fuel containing US-origin HEU
- DOE evaluating disposition options for graphite spheres
- After chemical digestion of the graphite:
 - 1) Dissolve, purify and down-blending the HEU to LEU for reuse as a reactor fuel; or
 - 2) Vitrify as high level waste in DWPF; or
 - 3) Separate the uranium, down blend to LEU, solidify and send the uranium as waste to an appropriate uranium disposal site
- Environmental Assessment under preparation in accordance with National Environmental Policy Act (NEPA)

Objective is to convert HEU to a form that it can longer be used as a nuclear weapon or improvised nuclear device



graphite SNF spheres



Recovered Fuel from Digested
Graphite Sphere

Los Alamos

- Following WIPP incidents, DOE made great effort to complete removal of 3706 cubic meters of TRU waste by June 30, 2014, in accord with Framework Agreement



- April 1, initiated shipments to Waste Control Specialists for temporary staging.
- DOE removed nearly 90% of the volume and 93% of the material at risk
- Over 38,000 curies removed from LANL
- Campaign paused in early May following discovery of concerns with LANL nitrate salts
- LANL TRU program paused to allow thorough review of issues and required actions
- Two water towers were demolished in Technical Area 21

Nevada

- Continued soil and groundwater remediation activities -- including characterization and monitoring of underground nuclear test contamination, cleanup of above-ground industrial sites and surface soil contamination
- Nevada National Security Site continues to serve an important cleanup mission as regional disposal facility for DOE LLW/MLLW:
 - FY13 Disposal: 1,099,000 cubic feet
 - FY2014 Forecast: 1,441,000 cubic feet
 - FY2014 to date: 76 percent of forecast (1,091,025 cubic feet through September 7)
- Continuing working group discussions with state of Nevada on unique waste streams



Tank Waste Update

Tank Waste Update

At SRS

- Operated DWPF to produce 125 canisters of vitrified HLW
- Operated ARP/MCU to disposition 800,000 gallons salt waste
- Continued closure activities on Tanks 12 and 16
- Continued construction of SDU 6
- Continued infrastructure upgrades and modifications to support future SWPF start-up

At Idaho

- Work since 2012 has focused on redesign and restart of the facility.
- Safe storage of HLW calcine continues

At Office of River Protection

- Full construction continues for the Low Activity Facility, Balance of Facilities and Analytical Laboratory
- Resolution of technical issues for the Pretreatment and High-Level Waste Facilities
- DOE and Washington State negotiations currently in-progress to amend the WTP and Tank Farm Consent Decree milestones
- Tank Vapors study being implemented by the Savannah River National Laboratory with a draft report due in Fall 2014

Integrated Waste Treatment Unit

- The Facility is going through thermal start up using simulant testing
- Completed steam reformer (DMR) bed fluidization and operability of the off-gas system using superheated steam, including heat-up of mercury adsorbers
- Completed operability of the product handling system, including canister filling operations
- The facility is preparing to introduce water and waste simulant to complete simulant testing (plugged waste feed nozzles caused delays - repairs completed)



Salt Waste Processing Facility



- SWPF construction is 76% complete
- New baseline approved by Deputy Secretary in August 2014
 - Total Project Cost: \$2.3 billion
 - Construction complete: December 2016
 - Start of operations (CD-4):
 - November 2018 (Early)
 - January 2021 (Late)

Office of River Protection: Construction Continues at the Waste Treatment Plant

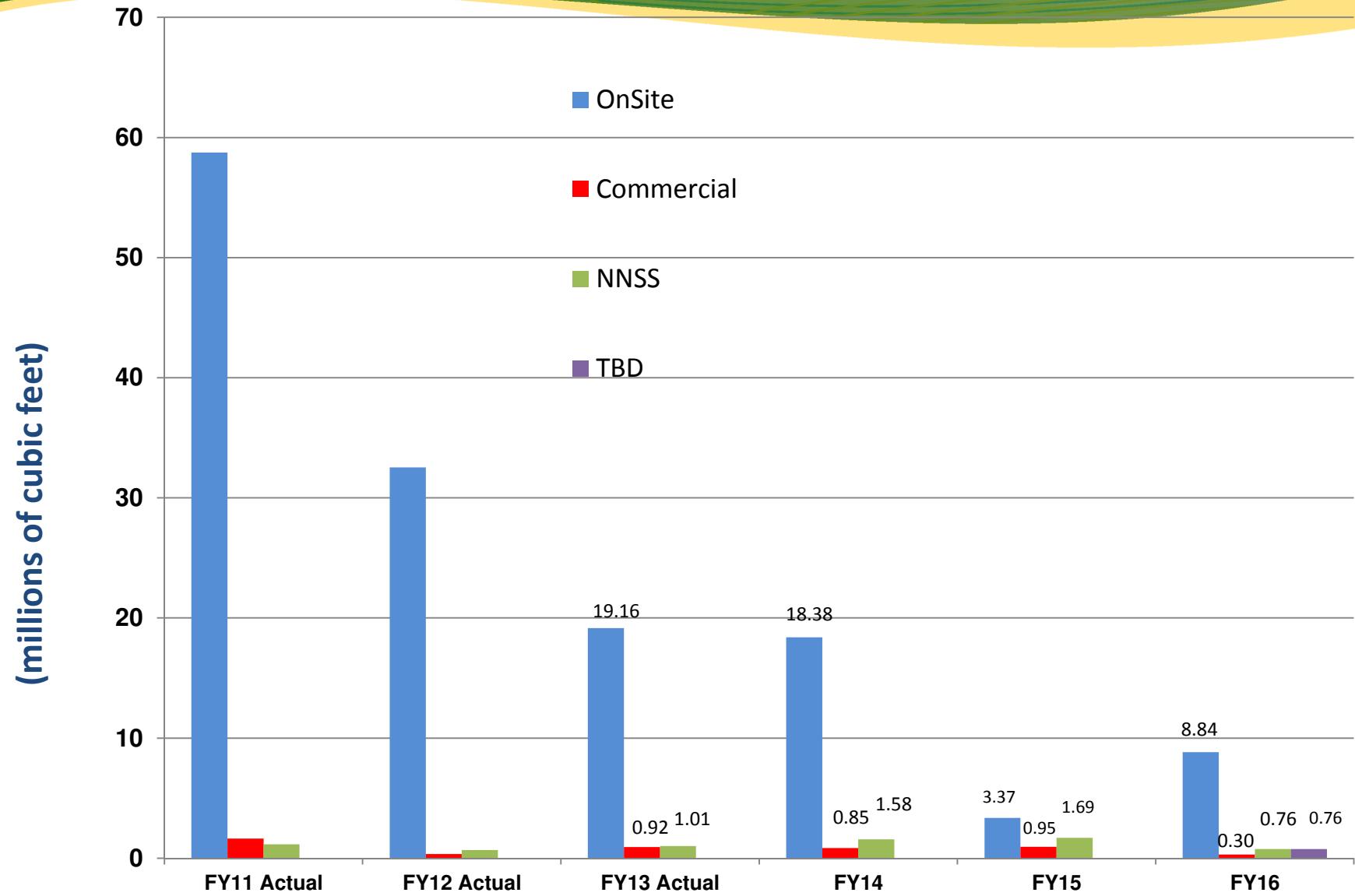


- FY2015 Planned work includes continuation of full construction of the Low Activity Waste Facility, Balance of Plant Facilities and Laboratory
- Resolution of technical issues

LLW/MLLW Update

Complex-wide LLW/MLLW Disposal

0.76



Disposal Forecast at NNSS FY 2014 (cubic feet)

Generator Site	Received 9/07/14	FY 2014 Forecast
Portsmouth GDP (OH)	446,000	532,000
Oak Ridge Reservation (TN)	201,000	239,000
Oak Ridge NNSA/Y-12 (TN)	164,000	151,000
Los Alamos National Lab (NM)	2,000	156,000
Idaho Site (ID)	78,000	72,000
Livermore Nat'l Lab (CA)	35,000	37,000
Paducah GDP (KY)	20,000	46,000
NNSA/Nuclear Fuel Services (TN)	80,000	79,000
Onsite NNSS (NV)	11,000	19,000
Savannah River (SC)		2,000
West Valley (NY)		12,000
All other sites	<u>54,000</u>	<u>96,000</u>
Total	1,091,000	1,441,000

- This forecast supports operational planning
- Some of the volume included within this forecasts may be dispositioned at other facilities

Commercial Disposal Options

- DOE policy supports consideration of commercial disposition options in addition to DOE options, when compliant, cost effective, and in the best interest of the U.S. government
- **EnergySolutions (Clive, Utah)**
 - Accepts Class A LLW and MLLW; 11e(2); NORM
 - Offers rail access, onsite treatment, and favorable bulk waste handling and disposal
- **Waste Control Specialists LLC (Andrews County, Texas)**
 - Multiple disposal facilities/licenses
 - Hazardous/exempt; 11e(2); NORM
 - Texas Compact Class A, B and C LLW – non-DOE waste
 - Federal Waste Facility Class A, B, and C LLW/MLLW – DOE waste
 - Offers onsite rail access, onsite treatment and storage capabilities

Waste Control Specialists

- 8/28/14 – TCEQ gave final approval for a major amendment to WCS' radioactive waste disposal license
- Expands the licensed disposal capacity at the WCS facility to nine million cubic feet (from 2.39 million)
- Authorizes the disposal of depleted uranium in both the Federal and Compact Waste Facilities



Flexibility must be preserved

- While we provide our sites flexibility and authority within our policy to make treatment and disposal decisions, we monitor the details of the project plans to maintain a national, complex-wide sense of the system.
- We consider exercising all available options at sufficient rates to ensure we don't lose alternatives
- Again, we have a fiscal responsibility to make use of investments that have been incurred. If we cannot, we have an obligation to consider whether revisions to site plans are warranted.

Waste Disposition Map Planning

Disposition Map Planning

- EM SSAB requested dispositions maps similar to ones presented at two national Waste Disposition workshops
- EM responded to the Chairs' March 4, 2014 recommendation on the graphic representation of waste disposition paths.
- Working group has been established to develop plan and initial maps
- Six –month work plan with goal to share proposed maps in SSAB Chairs Meeting in Spring 2015

Planned Disposition Map Content

- Maps will include West Valley, Savannah River, Oak Ridge, Portsmouth, Paducah, Los Alamos, Idaho, and Hanford
- Will include waste types generated – transuranic waste (TRU), high level waste (HLW), low level waste (LLW), mixed low level waste (MLLW), and spent nuclear Fuel (SNF)
- Will include:
 - types of wastes generated on the site
 - incoming waste streams other generator sites;
 - out-going wastes
 - on-site treatment
 - off-site treatment including location
 - on-site disposal
 - off-site disposal including location (NNSS or commercial)
 - TBD disposal (e.g. GDP D&D volumes)
- **SSAB feedback encouraged!**

In Closing...

- EM has made considerable progress, but significant programmatic challenges and scope remain.
- Safe and urgent recovery of the WIPP facility is a significant priority for DOE.
- Experience has proven that an optimized waste management system is vital to ensure environmental cleanup can continue
 - Continued integration and flexibility are critical
 - Financial and economic factors present real constraints
 - Pending and contemplated regulatory changes will also have impact
- Through partnership with regulators, tribes, stakeholders and industry, we have the ability to mitigate many of the impacts associated with upset conditions.