



U.S. DEPARTMENT OF
ENERGY

Solid Waste Management

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Savannah River Site Information Pods

Beaufort High School, Beaufort, S.C.

September 22, 2014

SRS E Area Solid Waste Management Facility

- Located in central region of SRS
- Waste Types Managed
 - Sanitary Waste
 - *Collected / transported to sanitary landfill*
 - Low Level Waste (LLW)
 - *Majority of LLW is disposed onsite in various disposal units*
 - *Disposal unit and method dependent on curie content and waste form*
 - Transuranic (TRU), hazardous and mixed wastes
 - *Stored on site only*
 - *Commercial vendors primarily used for hazardous waste and mixed waste treatment and disposal*
 - *TRU waste disposed at Waste Isolation Pilot Plant in New Mexico*



A Brief History of Legacy TRU at SRS

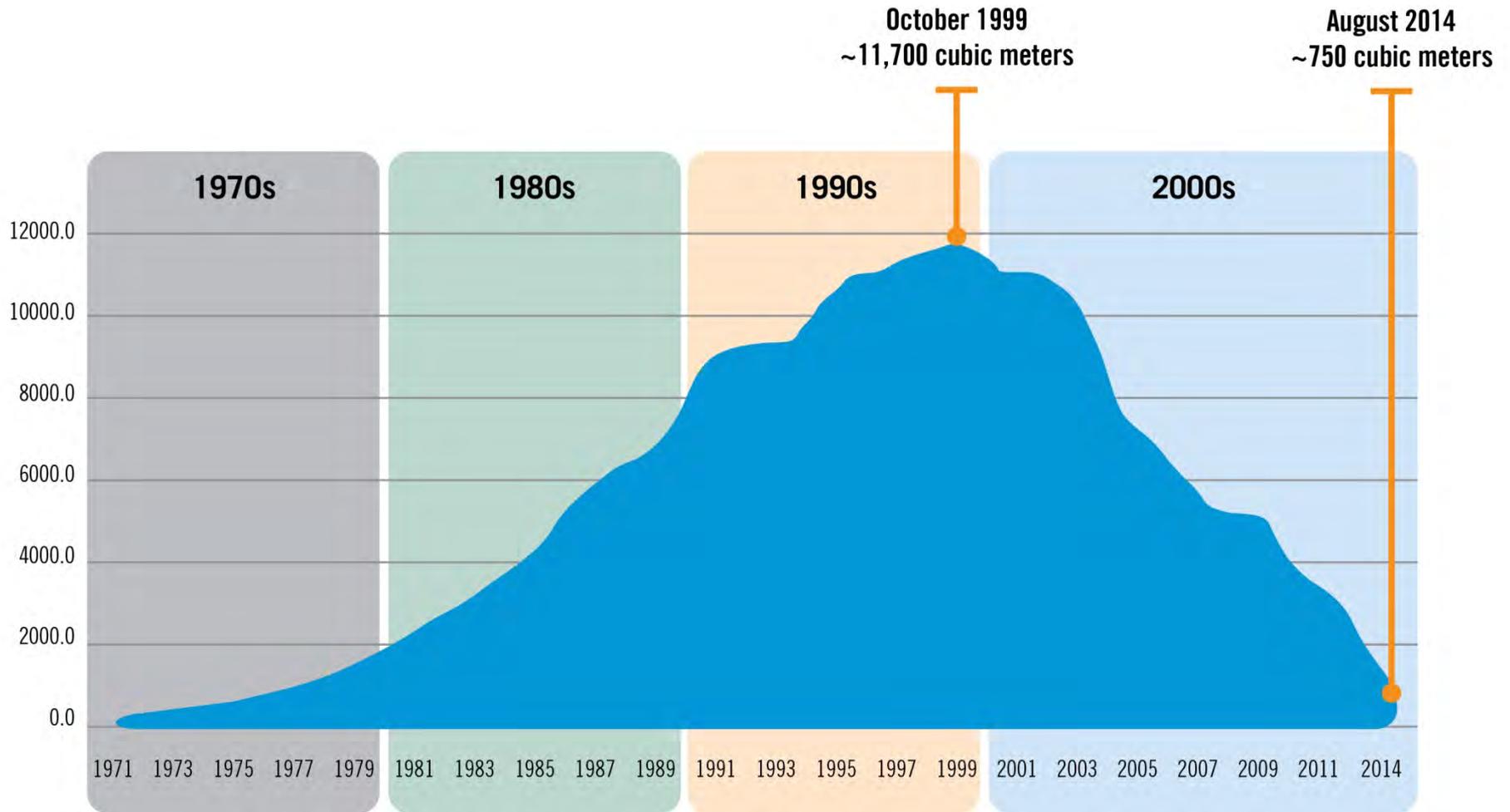
- From the early 1970s to April 2009, 13,750 cubic meters of TRU waste were generated
- Retrieval operations started in 1995
- Much of the waste required remediation and repackaging
- First shipment to Waste Isolation Pilot Plant occurred in May 2001
- Over 1,650 shipments made to date
- An estimate of 120 more shipments will complete legacy program
- About 30 percent of original waste volume stored was characterized as low-level waste for disposal



Legacy TRU Storage Over the Years



TRU Waste Stored Volume *(cubic meters)*



TRU Handling, Repacking and Preparation

To prepare legacy waste to be shipped to the Waste Isolation Pilot Plant, the waste was:

- 1 Removed from its container
- 2 Sorted
- 3 Repacked
- 4 Characterized/Certified
- 5 Loaded into shipping containers, such as TRUPACT-II, TRUPACT-III or 72-B containers



Transporting TRU Waste



- Highly-regulated process (safety, health, emergency preparedness, transportation)
- Numerous federal and state government agencies involved
- Requires coordination of Department of Energy sites across the U.S.

Summary

- After almost 20 years, all of the legacy TRU waste at SRS has been remediated, packaged, and characterized for disposal.
- TRU waste generated by ongoing operations is safely and compliantly packaged to ensure certification and disposal at WIPP.

■
TRU Pads 7-13
September 2005



■
TRU Pads 7-13
August 2008





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ENERGY

Waste Management - Liquid Waste

Lawrence T. Ling
Chief of Staff, Savannah River Remediation

SRR-LWP-2014-00043



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Liquid Waste Overview

- The U.S. Department of Energy awarded Savannah River Remediation a six-year base contract, plus a two year option, for high-level waste clean-up
- Contract began July 1, 2009
- Currently about 1,700 employees

Environment and Public Safety

- Protect human health and the environment
- 37 million gallons of high level waste
- 43 operational underground tanks. Two tanks undergoing closure. Six tanks closed total.



Waste Disposition

- Support U.S. government's nuclear nonproliferation agenda = H Canyon
- Remove waste from tanks and stabilize into glass and grout



Clean Up

- Clean the empty tanks
- Close tanks



A Focus on Safety



Industrial Safety



Radiological Safety



Environmental Safety



Chemical Safety

Safety: Perspective/Awards

- Construction forces (legacy and current) accumulated over 26.5 million safe hours
- Voluntary Protection Program Participants Association (VPPPA) Awards, Legacy of Stars, Safety and Health Achievement (second year in a row, only Site in DOE complex to receive this award) and Innovation Award
- American Heart Association Platinum Award (only Company in the Central Savannah River Area awarded)
- Greater than 17 months since last days away injury



Key Work Scopes

- **Tank Farm Operations**

- Continue storing liquid radioactive wastes in a safe and environmentally sound manner
- Remove waste and prepare for salt and sludge treatment

- **Waste Treatment**

- Operate Defense Waste Processing Facility (DWPF) to process sludge and salt streams into a vitrified waste form for future disposal in a licensed Federal Repository
- Operate the Saltstone Processing Facility (SPF) to process low-activity waste for disposal at the Saltstone Disposal Facility (SDF)

- **Tank Closure**

- Close non-compliant tanks meeting the requirements of the Waste Determination (WD) Basis documents and Federal Facility Agreement (FFA) schedules

- **Salt Disposition Integration**

- Install infrastructure to support future operation of Salt Waste Processing Facility (SWPF)



Tank Top - High Level
Waste Tank 16



Workers Lowering
Equipment into Waste Tank



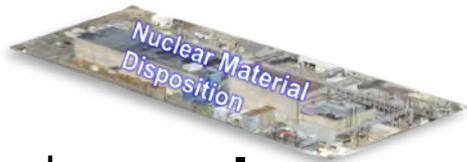
DWPF Canister Pouring
Operations



Effluent Treatment Plant
Control Room



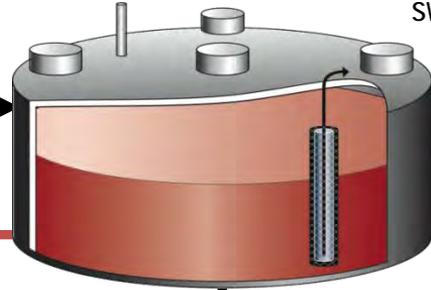
SRS Liquid Waste Program



Legend:
 ARP Actinide Removal Process
 BWRE Bulk Waste Removal Efforts
 DWPF Defense Waste Processing Facility
 MCU Modular Caustic Side Solvent Extraction Unit
 SWPF Salt Waste Processing Facility

Operational Goals
 ✓ Radionuclides to glass
 ✓ Chemicals to Saltstone
 ✓ Tanks closed

Legacy Liquid Waste
 43 tanks, 37 Mgal
 280 MCi



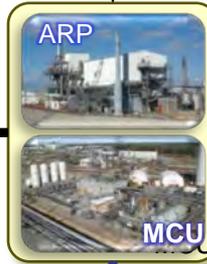
Tanks Cleaned and Closed
 <1% radionuclides remain in tanks

51 Tanks

- 6 grouted & closed
- 2 heel removal complete
- 6 BWRE complete
- 63% empty (old style)
- 20% empty (new style)

Salt waste
 7.3 Mgal treated

Salt Processing



Sludge waste
 3.8 Mgal treated



Radionuclides



>99% radionuclides to glass

Poured 3,861 cans of projected 8,582 53 million curies immobilized in glass

Inert chemicals



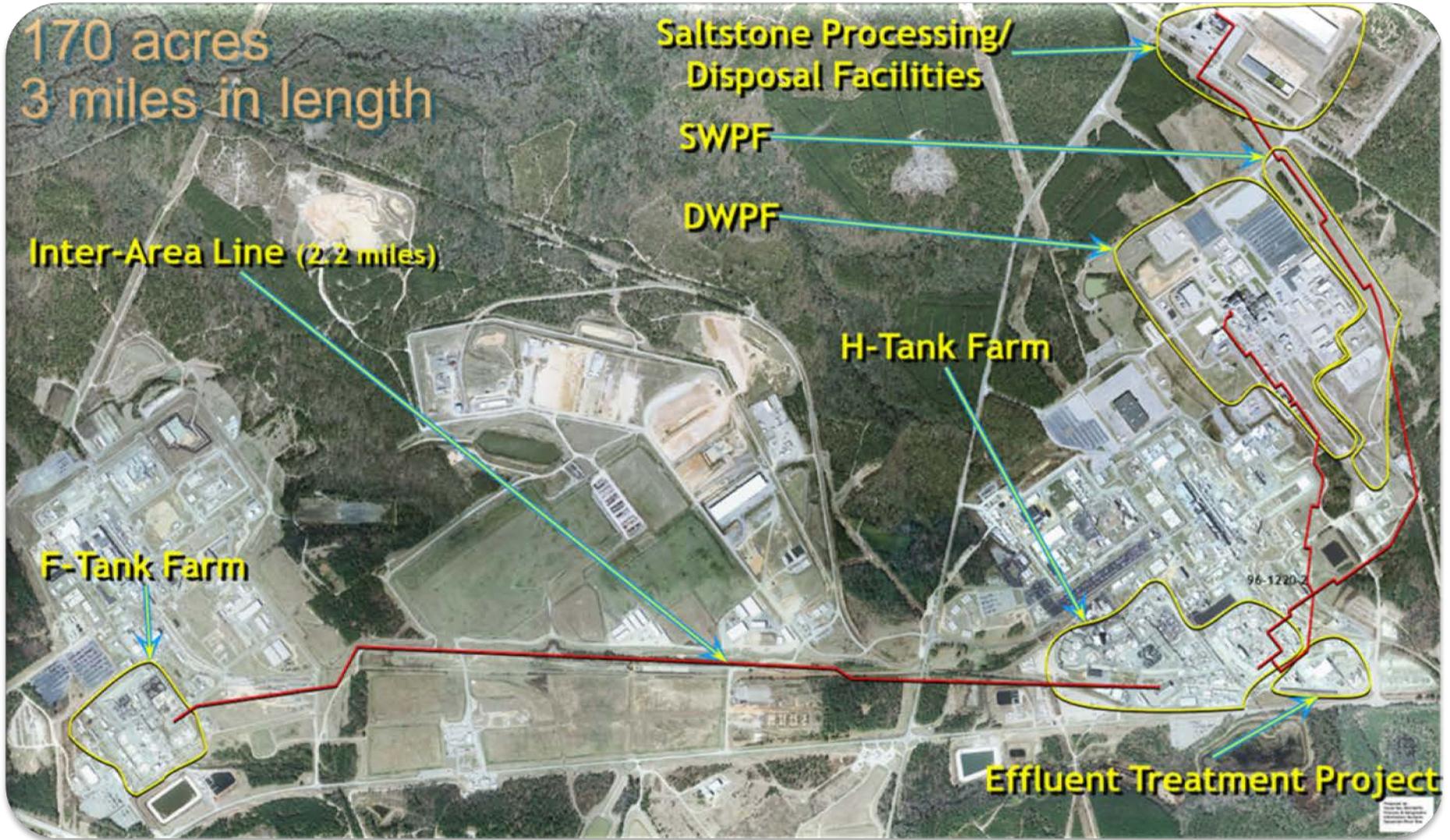
16 Mgal grout dispositioned containing 414 kCi

<<1% radionuclides to saltstone



SWPF (under construction)

Liquid Waste Operations Overview



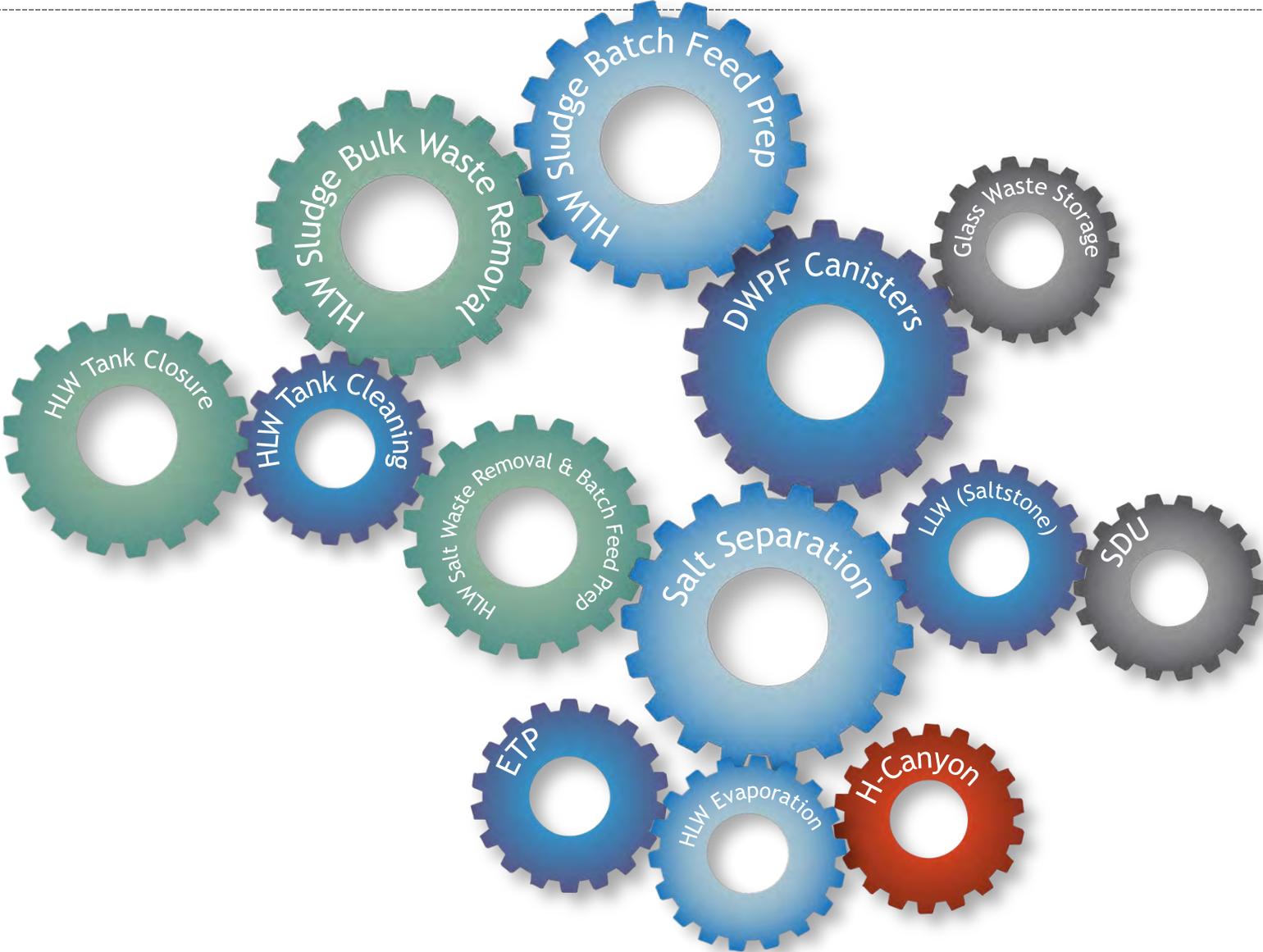
F-Tank Farm & F-Canyon



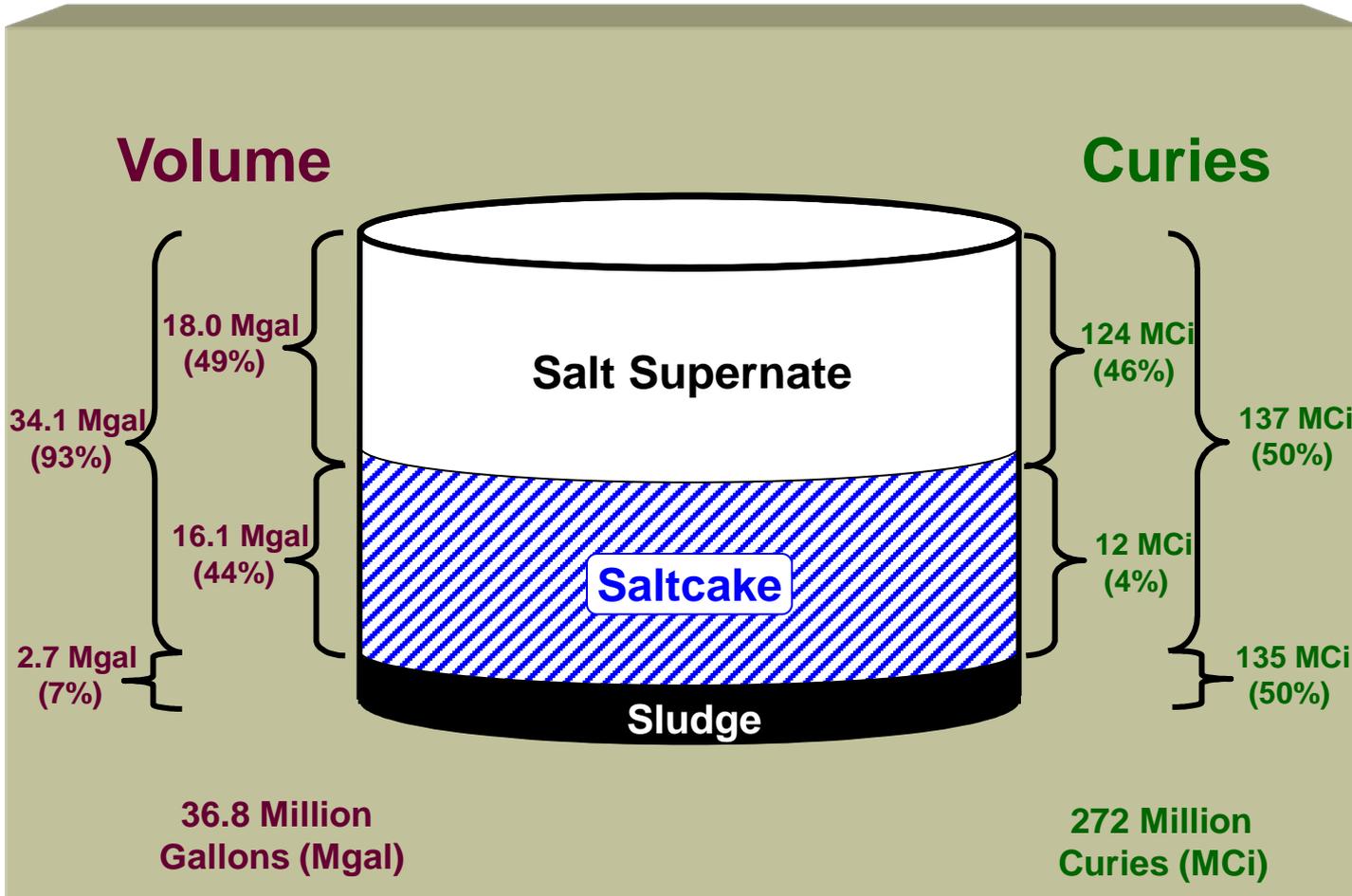
H-Canyon & H-Tank Farm



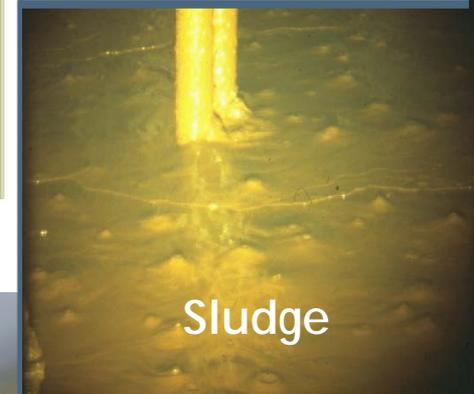
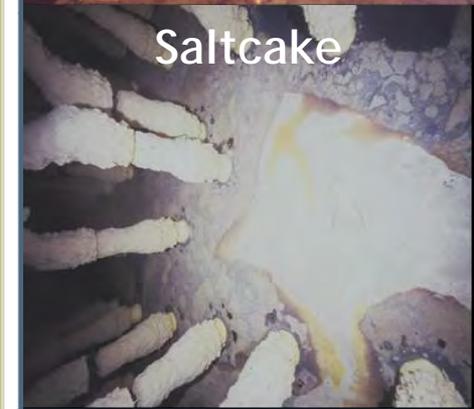
An Integrated System



SRS Composite Inventory



Inventory values as of 2014-06-30



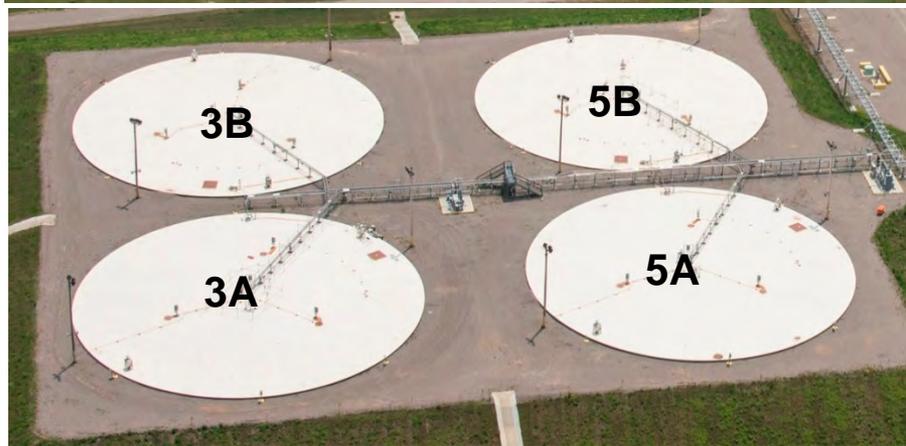
Salt Processing

Saltstone Disposal Units (SDUs)-2, 3, 5 & 6 as of August 07, 2014



SDU Status

SDU-2A & 2B were filled in early August 2014



- Started filling SDU-5B in August 2014
- Current plan is to fill Unit 5B and then start filling 5A.
- Dimension 150' diameter X 22" high
- Capacity ~2.3M gallons

SDU-6 Construction Continues

- Design is based on commercial water storage tanks
- Dimensions are 375' diameter X 43' high
- Capacity ~30M gallons



- First Core Wall is complete
- 9 of 10 floor sections are complete
- 5 Roof Columns are poured



Record Production Last Year

Defense Waste
Processing Facility



- DWPF: 40 canisters produced in August, most ever in one month since startup in 1996
- ARP/MCU processed 1.3 million gallons of salt waste for the year, most ever since startup in 2008
- Saltstone facilities: 2 million gallons processed during the year, most ever since startup in 1990

Saltstone Facility



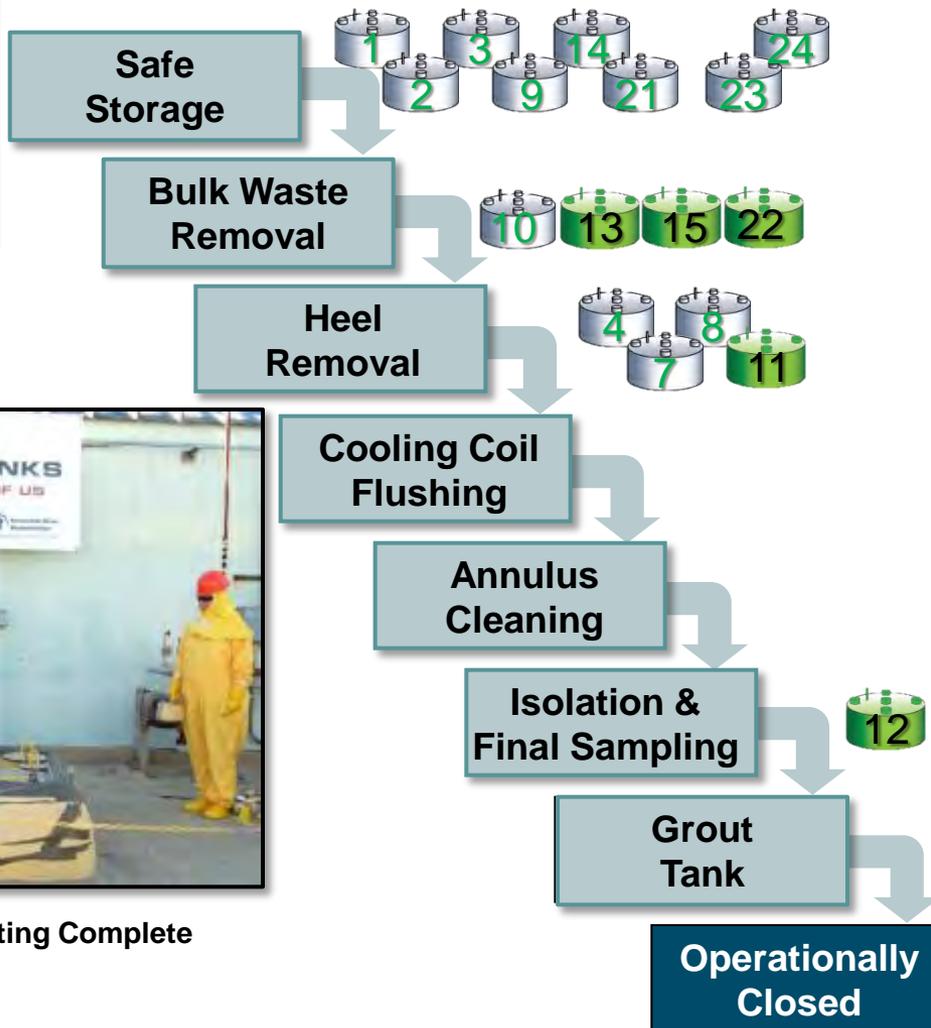
Actinide Removal Process (ARP)
& Modular Caustic Side Solvent Extraction Unit (MCU)



Tank Closure Progress

6 tanks operationally closed

6 more active in the closure sequence



- Active Tank Status**
- 13 — Hub Tank
 - 15 — BWR (sludge) development
 - 22 — BWR (sludge) mix & transfer
 - 11 — Receiving pumps from Tank 12
 - 12 — Sampling preparations
 - 16 — Samples being analyzed & grout preparations

LEAN efficiencies allow progress recovery



Tank 5 and 6 Grouting Complete

Tank Closure



Conclusion

- We continue to perform safely
 - Focus on safety has been excellent
- Sharing our technology and our people across the DOE Complex for cost-savings
- Operations are proceeding as planned, and progress is being made
- Waste treatment and tank closure work reduces the risk for all of us

