



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
**ENVIRONMENTAL
MANAGEMENT**

Tank Waste Risk Reduction at SRS

Past, present and future

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“Liquid waste at SRS is the single greatest environmental risk in South Carolina”

Program focus:

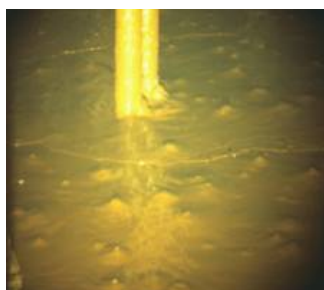
- Safely storing 37 million gallons of radioactive liquid waste
- Operating major nuclear facilities to support H-Canyon missions and to treat and disposition tank waste
 - Operating interim salt waste processing system
 - Vitrifying highly radioactive radionuclides at the Defense Waste Processing Facility (DWPF)
 - Disposing low level residuals in Saltstone Disposal Units (SDUs)
 - Constructing the Salt Waste Processing Facility (SWPF)
- Emptying, cleaning and closing waste tanks



Salt Supernate



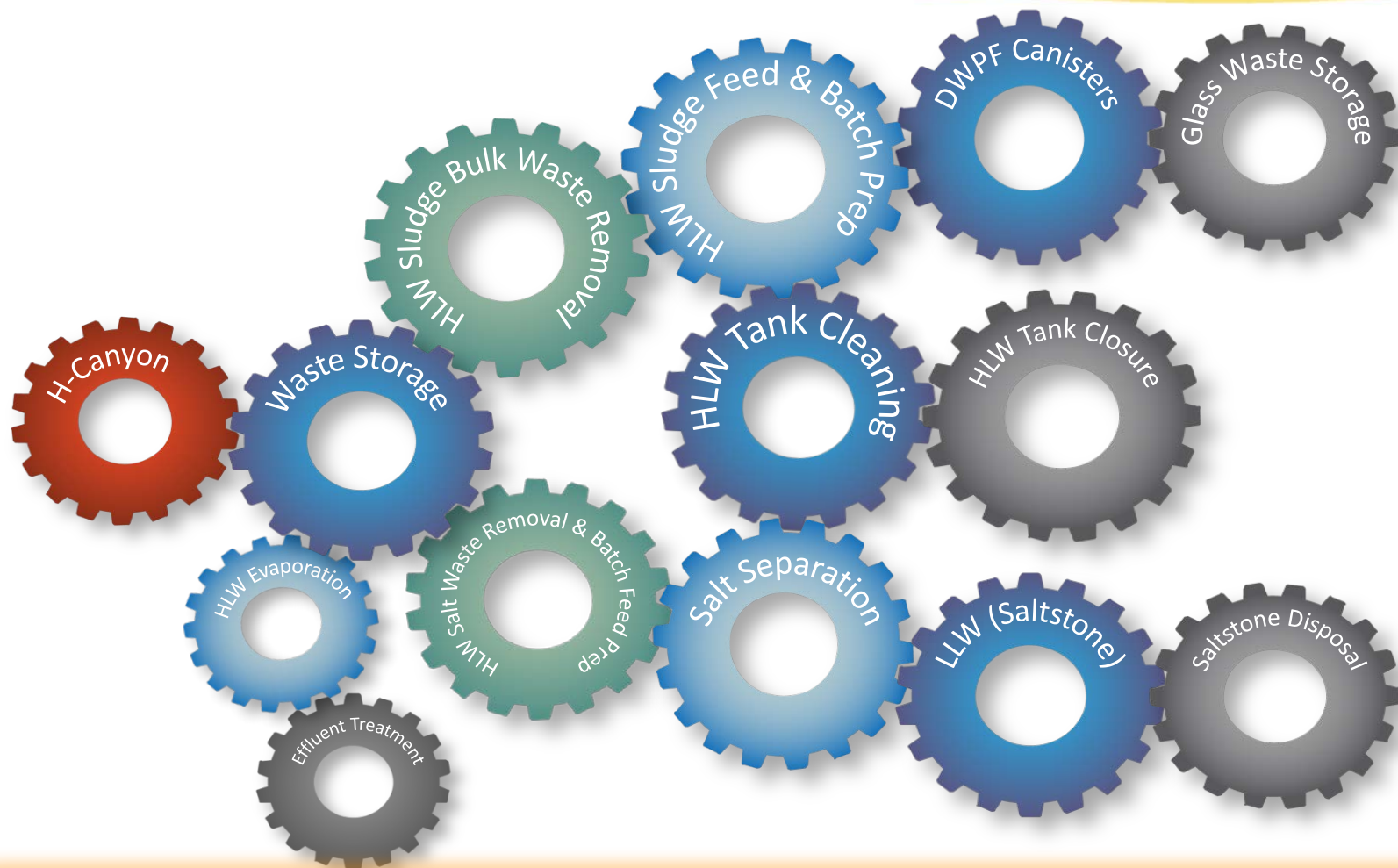
Saltcake



Sludge

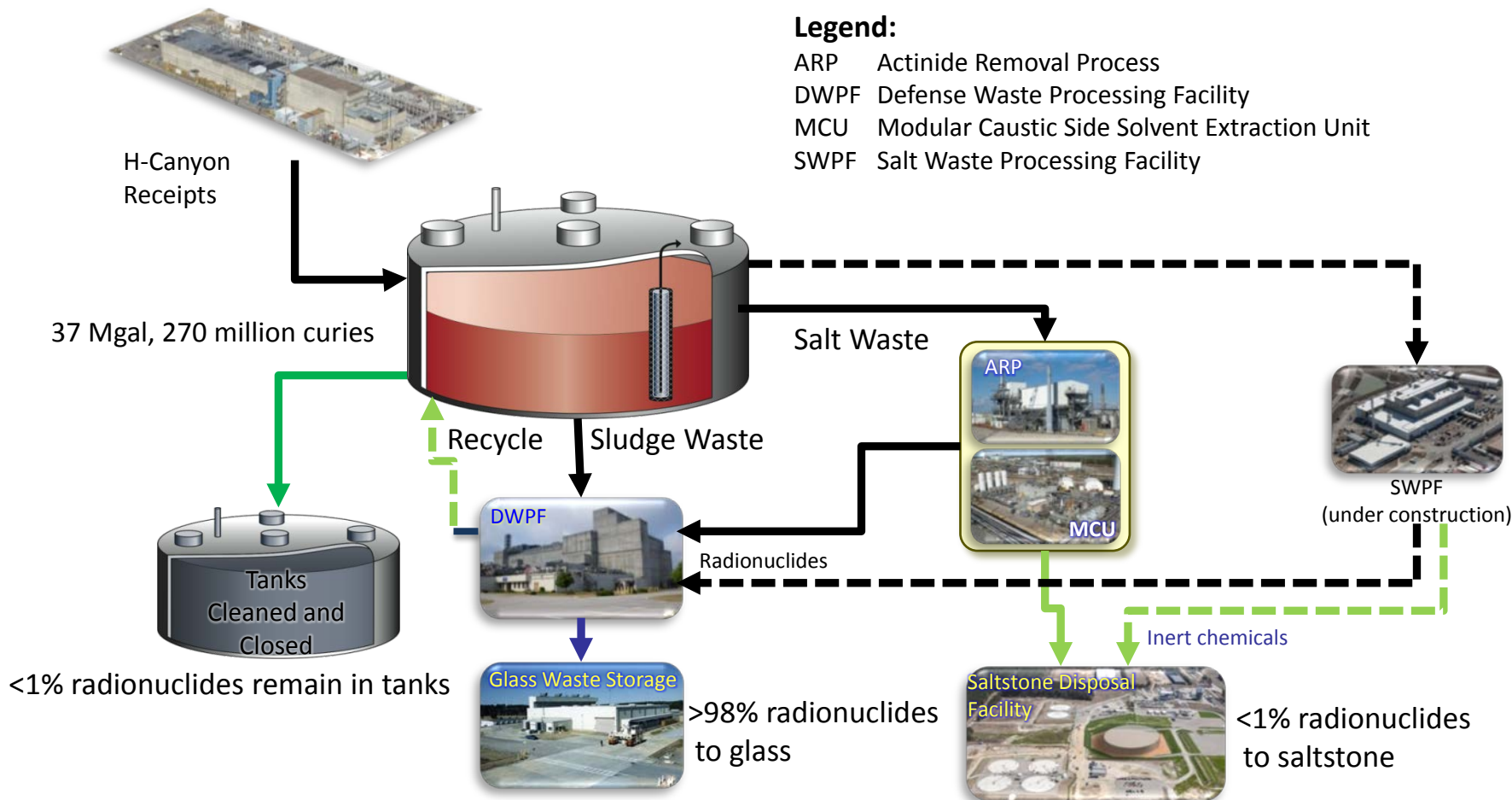
Safely Stored Canisters

Liquid Waste Program Integration



Safe storage, treatment, and disposition of SRS liquid waste requires synchronization of several highly interdependent nuclear facilities and chemical operations

Key Liquid Waste Facilities



Defense Waste Processing Facility

- World's largest vitrification plant
- Entire 37 million gallons of waste awaiting disposition has about 270 million Ci of radioactivity
- Almost all radioactivity from waste dispositioned via DWPF – over 50 million Ci to date
- Over 3,700 canisters filled since 1996



Interim Storage of Canisters

- DWPF Glass Waste Storage Buildings (GWSB)
 - *Seismically qualified underground concrete vaults*
 - *Designed for safe interim storage*
- Approaching capacity of existing storage
 - *GWSB 1 is full (contains 2,244 canisters)*
 - *GWSB 2 contains ~1,460 canisters (2,340 capacity)*
- Modular storage concept being considered for remaining cans
 - *Targeting operational readiness by 2018*



Saltstone Processing Facility

- Vast majority of waste volume from tanks – but little radioactivity – left in SC
- Curies left in SC are treated for disposal at the Saltstone Processing Facility
 - Salt solution stabilized by mixing with cement, flyash and slag
 - Resulting grout mixture mechanically pumped into concrete Saltstone Disposal Units (SDUs)
- Safely processed over 7 Mgal of low-level radioactive liquid salt wastes to date containing approximately 400 KCi of radioactivity



Saltstone Disposal Facility

- Engineered low level waste disposal facility
- Grout is non-leaching and has low water permeability
- Initial 12-cell rectangular vault (Vault 4) filled
- Saltstone Disposal Unit (SDU) -2 – modern watertight design – now full
- SDU 3 and 5 completed and being filled
- Currently constructing 3rd generation SDU-6






Interim Salt Processing Facilities



Centrifugal Contactor Bank



Modular Caustic Side
Solvent Extraction Unit
(MCU)



Actinide Removal
Process (ARP)

- Actinide Removal Process/Modular Caustic Side Solvent Extraction Unit operational since 2008
- Remove actinides, Strontium and Cesium (Cs-137) from salt waste
- Nominal capacity 1.5 Mgal/yr
- Over 4 million gallons treated to date
- Decontamination and throughput exceed initial expectations
- Completed service life extension program
- Completed installation of Next Generation Cesium Solvent
- Providing operating experience for SWPF startup and initial operations



Salt Waste Processing Facility



Constructed by Parsons

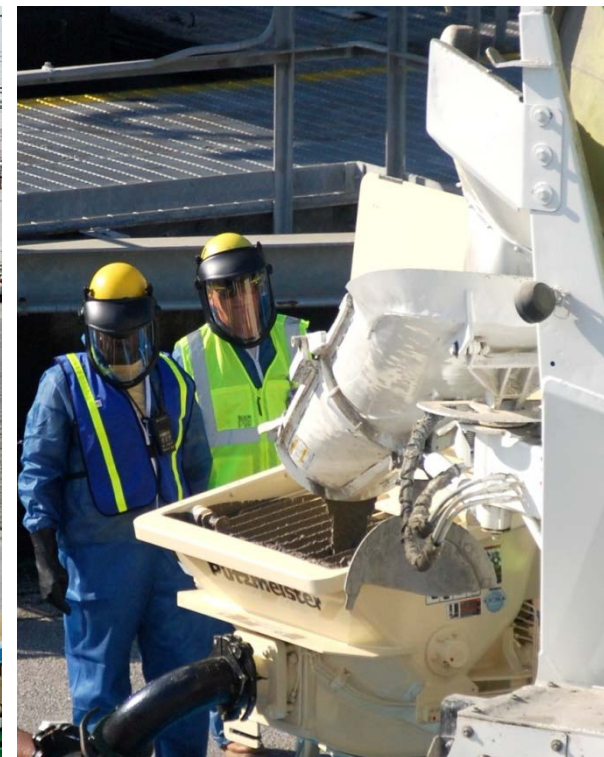
This critical facility will:

- Reduce radioactive waste volume requiring vitrification
- Utilize the same actinide and cesium removal unit processes as Interim Salt Processing Facilities
- Ultimately process over 90% of Tank Farm liquid radioactive waste

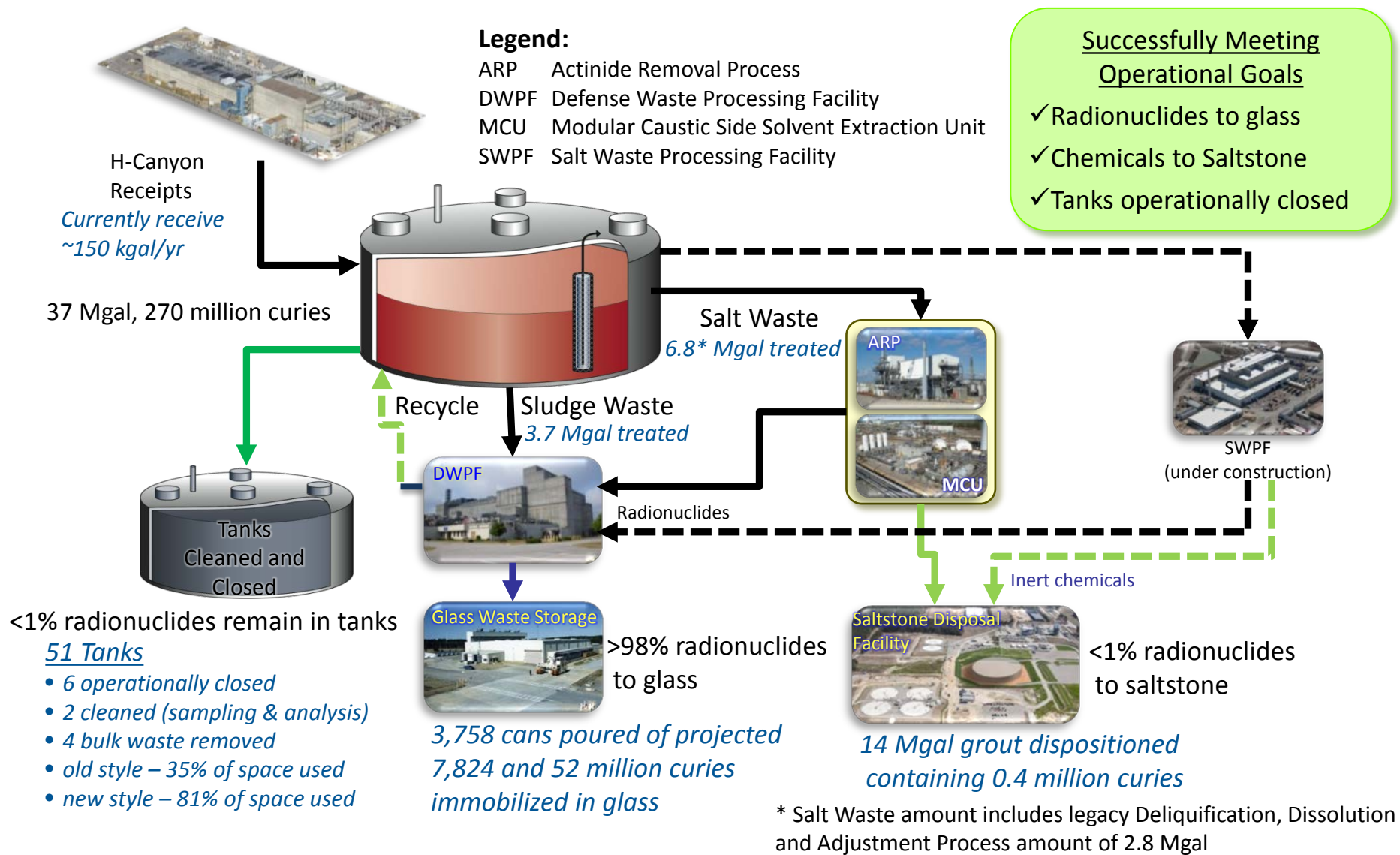


Tank Closure

- All tanks will be emptied of waste, cleaned and closed
- Removal and closure of 24 “Old Style” tanks driven by Federal Facility Agreement (FFA)
- Tanks 17 and 20 closed in 1997
- Tanks 18 and 19 were closed in 2012
 - Working with regulators and stakeholders, completed ahead of FFA milestone
- Tanks 5 and 6 were closed in Dec 2013
 - well ahead of 2015 FFA milestone



Pouring grout into SRS waste tanks (April 2012)




SRS Liquid Waste Program – Challenges

- Delays in construction of SWPF have adversely impacted ability to meet regulatory commitments
 - *Tank waste removal and closure milestones identified in the SRS FFA*
 - *Striving to meet FFA milestone to close Tanks 12 and 16 in 2015*
 - *Removing and treating salt waste is key to meeting future FFA milestones*
 - *SRS currently ahead of schedule, but all out year milestones are at risk*
- Reduced program funding expectation limits opportunities to mitigate delays
 - *Will seek opportunities to deploy beneficial new technologies*
 - *Next Generation Cesium Solvent (currently being deployed in MCU)*
 - *Small Column Ion Exchange (additional funding required)*
 - *Opportunities for additional system efficiency are limited*
 - *Must guard against tendency to drastically reduce infrastructure preservation and maintenance spending to fund program milestone progress*
 - *Shifting planning priority toward timely system readiness for SWPF operation*

Effects of Reality - FFA Commitments

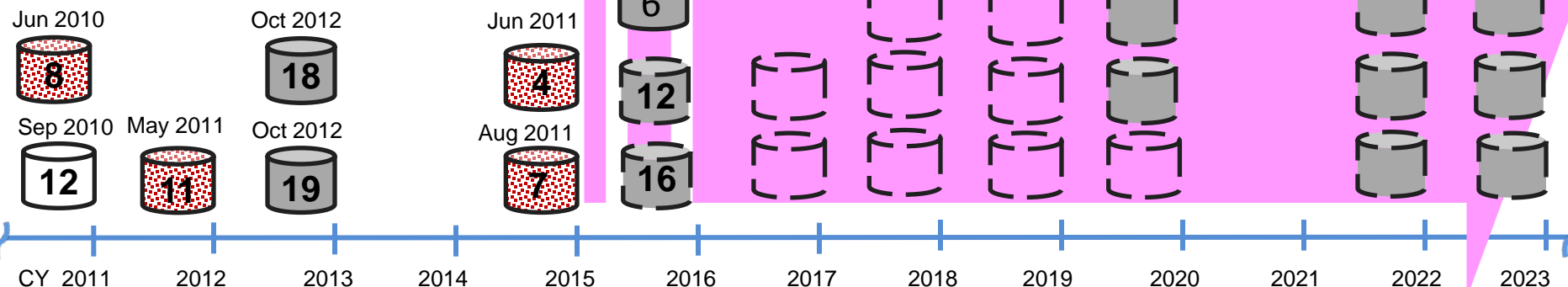
 Bulk Waste Removal (BWR) Milestone
  Reuse after BWR complete

 Closure Milestone

 BWR Completed

 Closed

At Risk



SWPF Delay

SRS Liquid Waste Program – Future Focus

- Tank waste cleanup mission remains a top EM priority, but the pace of progress must slow to match reduced available funding
 - *Will work with South Carolina Department of Health and Environmental Control and US Environmental Protection Agency to address future regulatory milestones*
 - *Will seek additional efficiencies and sharing of expertise to re-accelerate pace*
- SRS will continue to treat and disposition salt and sludge waste to reduce environmental risk
 - *Continue to operate DWPF and interim salt treatment facilities*
 - *Reduce risk*
 - *Maintain space for safe operations*
 - *Focus on system readiness for SWPF operations*
 - *Complete critical infrastructure improvements*
 - *Make space for preparing feed*
 - *Qualify feed in preparation for startup*
- Will continue to support critical H-Canyon missions



Questions?

