Cost Savings Initiatives (CSI) Process And System Plan Revision 17 Results

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Project Integration and Planning
Savannah River Remediation

March 27, 2012
• To fulfill Savannah River Site Citizens Advisory Board 2012 Waste Management Committee Work Plan topic
• Liquid Waste Process Overview
• Cost Savings Initiative
• System Plan Rev. 17 Status
• System Plan Rev. 17 Inputs & Assumptions
• System Plan Rev. 17 Results
• Summary
Liquid Waste System

- **DOE Complex Legacy Materials**
- **Savannah River & other Spent Fuel**
- **H Canyon**
  - **H Tank Farm**
  - **F Tank Farm**
    - **Empty Tanks -> Closure**
- **Salt Solution**
- **Aluminum Dissolution**
- **Sludge Washing**
- **ARP/MCU**
- **SWPF**
- **At-Tank Treatment SCIX**
- **Salt Processing**
- **Saltstone**
- **DSS**
- **Disposal**
- **GWSBs**
- **Canisters**
- **DWPF - Defense Waste Processing Facility**
- **GWSB - Glass Waste Storage Building**
- **ARP - Actinide Removal Process**
- **MCU - Modular Caustic Side Solvent Extraction Unit**
- **SWPF - Salt Waste Processing Facility**
- **DSS - Decontaminated Salt Solution**
- **SCIX - Small Column Ion Exchange**
- **SDUs - Salt Disposition Units**
- **NGS - Next-generation Solvent**
Regulatory Drivers

• Federal Facilities Agreement
  - Requires the 22 remaining old-style tanks to be operationally closed by the end of FY2022

• Site Treatment Plan (STP)
  - Requires “removal of the backlogged and currently generated waste inventory by 2028”
Projected Life Cycle

- Previous SRS Baseline
  - Federal Facilities Agreement commitment for closure of old style tanks
  - STP commitment for completion of waste removal

- System Plan Revision 16 (Max Life Cycle Acceleration)
  - Salt Waste Processing Facility Startup
  - Old-Style Tank Closures Complete
  - All Waste Removal Complete
  - All Tank Closures Complete
SRR Funding Profile

Note that GWSB# 3 not included in the funding profile

<table>
<thead>
<tr>
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<th>FY12</th>
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<td>$759</td>
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Note that GWSB# 3 not included in the funding profile
• All Liquid Waste activities are placed on an Integrated Priority List
• In the past, the funding line would be moved up or down the list to match the funding allocation
  – everything below the line was cut
• This would have impacted:
  – waste removal to provide feed to Defense Waste Processing Facility
  – tank closures
  – preparations for Salt Waste Processing Facility startup
• A new approach was needed
  – that can be executed with high confidence
  – without reliance on new technologies or regulatory relief
Reinvention Process

4 Step Plan

1. Scope and Price the Just in Time (JIT) Compliant Case
   - eliminate everything that is not needed to support regulatory commitments, employee development and safety
   - schedule what remains on a Just in Time basis

2. Add new scope and pricing not in the current contract

3. Compare JIT Compliant Case cost to expected funding

4. Priority Add Backs (PABs)
   - Use unallocated funding to “buy back” program acceleration or to reduce programmatic risk

JIT Compliant Case + PABs = Recommended Case

• New technologies will be pursued, but treated as opportunities
Scope to meet regulatory requirements JIT

1. Surveillance and Maintenance

2. Immobilize sludge to meet the STP & FFA JIT
   - adjust canister production to finish Sep 2028 which is an average of 275 cans/year with melter outages
   - adjust GWSB #3 schedule to match canister production

3. Immobilize salt to meet the STP & FFA JIT
   - Rely on SWPF (Small Column Ion Exchange not needed for JIT)

4. Close tanks to meet the FFA JIT
   - defer tank closures so that the FFA is met JIT in FY2022

5. Receive waste from other site missions
Priority Add Back Guide

- Mega SDUs and Control Room Consolidation (Investments with Return on Investment of < 3-4 years)
- Mature Tank 48 alternative treatment technology
- Accelerate closure of old-style sludge tanks (unrestrained by SWPF)
- Deploy Small Column Ion Exchange to reduce SWPF risk (late start, low throughput)
- Accelerate DWPF to finish Dec 2026 (275 > 320 cans/yr)
- Additional acceleration of tank closures as increased salt processing allows
- Start Tank 48 chemical destruction field modifications
- Life Cycle acceleration per LWSP rev. 16
• Replace current Salt Disposal Units (SDUs) design with a Mega-SDU design
• Each Mega-SDU will provide disposal capacity equivalent to approximately 10 previously planned SDU cells.
• Benefit
  – Reduces project costs associated with construction installation materials and schedules
• Cost savings
  – ~$97M from FY12-FY17
  – ~$487M lifecycle
• Combines 4 separate control rooms into one Consolidated Control Room

• Benefits
  – Improved safety environment
  – Enhanced conduct of operations and command/control
  – Simplified communications
  – Consolidate and standardize operator interface
  – Integrated computer system

• Cost savings
  – ~$21M for FY12-FY17
  – ~$54M lifecycle
Projected Life Cycle Savings at Expected Funding

Previous SRS Baseline

Federal Facilities Agreement commitment for closure of old style tanks

STP commitment for completion of waste removal

System Plan Revision 16 (Max Life Cycle Acceleration)

System Plan Revision 17 (Current Expected Funding)

Salt Waste Processing Facility Startup
Old-Style Tank Closures Complete
All Waste Removal Complete
All Tank Closures Complete
The Recommended Strategy supports:

- FFA compliance
- STP compliance
  - All salt and sludge processed by 2026
- Major portion of Life Cycle Cost savings preserved
  - 4 years at $2B
- Maintains the option for further Life Cycle acceleration with additional investment
Approved by SRR and DOE
System Plan Rev. 17 assumptions are aligned to meet the Federal Facility Agreements for waste removal and tank closure commitments and the Site Treatment Plan commitment for completion of waste processing

- **Process salt waste**
  - Operate Interim Salt Processing (ARP/MCU) to provide needed tank space and support Salt Waste Processing Facility (SWPF) Operations
  - Provide feed to SWPF & Small Column Ion Exchange (SCIX)
  - Start up and operate SWPF & SCIX

- **Reduce lifecycle cost and schedule for sludge processing**
  - Optimize Defense Waste Processing Facility (DWPF) processing efficiency (waste loading, process improvement, etc.)
  - Deploy technology for reducing sludge mass – aluminum removal

- **Close tanks**
  - Deploy technologies for tank cleaning – chemical, mechanical and annulus
  - Gain regulatory approval – Section 3116 and State

- **Support H-Canyon nuclear materials disposition operations**
• Changes are driven by:
  – Advances in Technology
  – Change in Sequencing
  – Acceleration Opportunities
  – Cost Savings Opportunities
  – Funding Adjustments
• ARP/MCU
  – The ARP and MCU facilities will shutdown prior to the startup of SWPF allowing for SWPF tie-ins

• Small Column Ion Exchange (SCIX)
  – Rescheduled based on funding to September 2018

• Salt Waste Processing Facility (SWPF)
  – Start-up October 2014
  – Processing rates increased through implementation of next generation solvent
• Saltstone Processing Facility
  – Processing supports ARP/MCU operations and is increased with SWPF startup

• DWPF will implement productivity enhancements during the SWPF tie-in outage
  – Modifications support increased influents from SWPF acceleration

• DWPF melter replacement occurs during the SWPF tie-in outage and then every 6 years
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<th>Key Milestone</th>
<th>Revision 16</th>
<th>Rev. 17</th>
<th>FFA/STP Commitment</th>
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<td>Date when all Type I, II, and IV tanks are closed</td>
<td>2018</td>
<td>2022</td>
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<td>DWPF processing complete</td>
<td>2024</td>
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<td>December 2015</td>
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<td>Initiate SWPF Processing</td>
<td>July 2014</td>
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<td>–Salt Solution Processed via DDA only</td>
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<td>27 Mgal</td>
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<td>Total number of Saltstone Disposal Units</td>
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* Higher capacity “Mega” SDUs
### Closure Summary

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- **Rev 16**
- **Rev 17**
- **FFA Commitment**
Summary

• The System Plan documents current operating strategy of the SRS Liquid Waste System
• System Plan Rev. 17 assumptions are aligned to meet the Federal Facility Agreements (FFA) for waste removal and tank closure commitments and the Site Treatment Plan (STP) commitment for completion of waste processing
• System Plan Revision 17 forecasts compliance with FFA and STP commitments