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SAVANNAH RIVER REMEDIATION CONTRACT ACCOMPLISHMENTS

Tom Foster
SRR President and Project Manager





- SRR started the contract on July 1, 2009
- 6-year base contract, plus 2-year option, for high-level waste cleanup at SRS ending June 30, 2017
- DOE extended the contract to December 31, 2017, and again to May 31, 2018
 - Current workforce of ~2,200 employees (including subcontractors)
- Focused on Liquid Waste Mission
 - High-hazard operations
 - Managing waste tank space
 - Treating and dispositioning waste
 - Complex Engineering, Procurement, & Construction
 - Closing waste tanks

- **Record-setting worker safety**
 - >6.5 million total project safe work hours - **highest total since contract began**
 - SRR Construction >29 million safe work hours (nearly 19 years)
- **Received the Voluntary Protection Program Star of Excellence for safety each year of contract**
- **Recognition**
 - Received multiple state and national awards each year for safety
 - Voluntary Protection Program Participants Association (VPPPA) Awards:
 - First contractor in DOE complex to have VPPPA National Safety and Health Achievement Award multiple winners in a single year
 - Four consecutive years SRR had a winner
 - DOE 2017 Sustainability Award:
 - Retention basin indicated elevated pH as a result of algae growth in summer months
 - Installed 12-sided “rhombos” that prevent sunlight contact with water inhibiting algae
 - Eliminates the need (and cost) to use well water to reduce the pH
 - Received the American Heart Association Workplace Health Solution Award in 2017

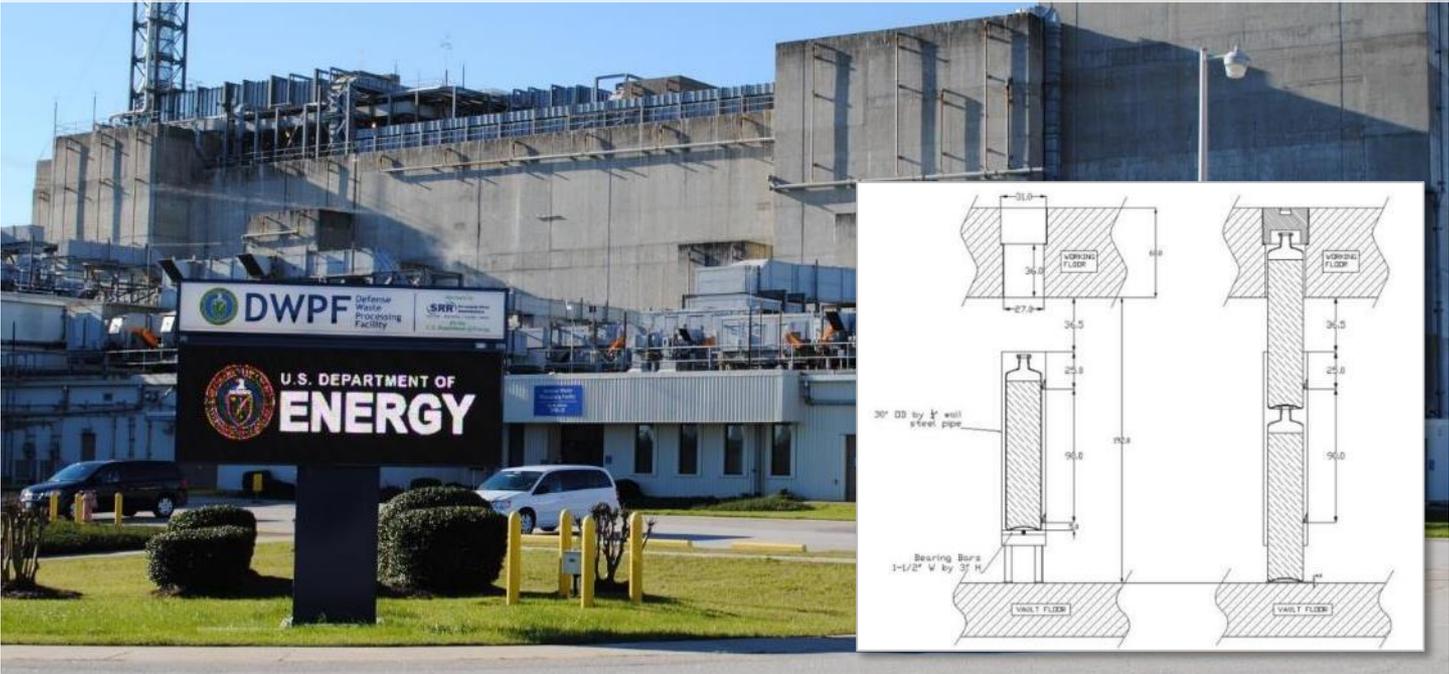


> 2,900 days (the life of the SRR contract) without an Environmental Notice of Violation



Contract Accomplishments

- Produced more than 1,500 canisters and poured 6 million pounds of radioactive glassified waste at the Defense Waste Processing Facility
- Designed and executed the DWPF Canister Double Stack Project



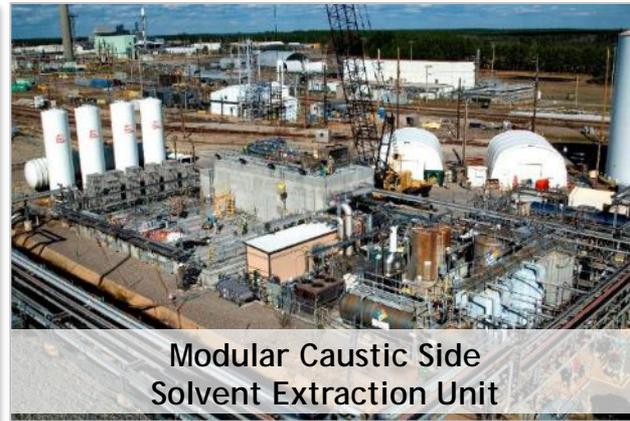
Contract Accomplishments

- Processed more than 6 million gallons of salt waste through interim salt processing facilities known as the Actinide Removal Process/Modular Caustic Side Solvent Extraction Unit
- Implemented Next Generation Solvent into interim waste processing

Piloted and proved the technology for the Salt Waste Processing Facility



Actinide Removal Process



Modular Caustic Side
Solvent Extraction Unit

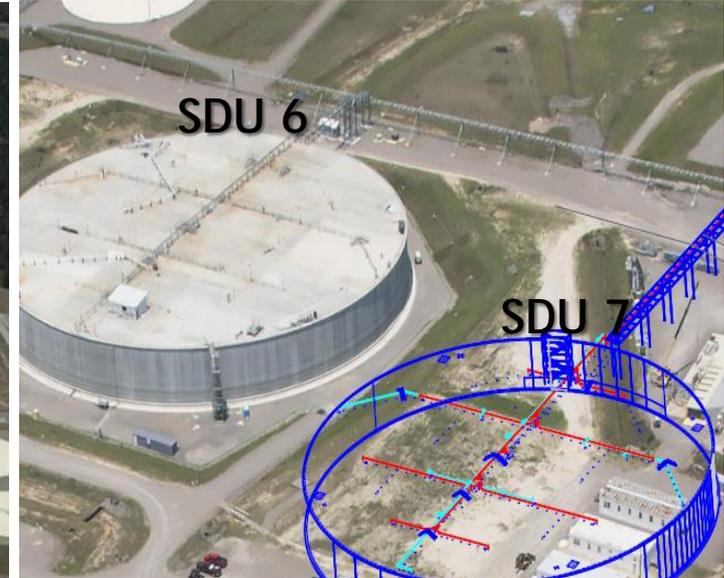
Contract Accomplishments

- Stabilized and disposed of more than 10.9 million gallons of low-level liquid waste through the Saltstone Production Facility (SPF)
Readied SPF to handle huge SWPF throughput increase



Contract Accomplishments

- Designed and built SRS' first mega-volume (32 million gallons) Saltstone Disposal Unit (SDU) from the ground up



Completion of SDU 6 construction, which cost \$120 million, came in 16 months ahead of the target schedule and more than \$25 million under the target cost

- **SDU 6**
 - DOE Environmental Management Project of the Year - Nov. 2017
- **SDU 7**
 - Completed Phase 1 by removing trailers, structures, and yard materials
 - Awarded storm water reroute subcontract to BK All American Company, LLC
 - Completed team review of General Site Prep Design
- **Projected SDU 7 Activities**
 - Mobilize storm water reroute subcontractor
 - Install storm water pipe under active SDU grout line, Jan. 2017
 - Submit CD 2/3 package to DOE, Dec. 2017
 - Issue site prep and cell design, Dec. 2017
- **SDUs 8&9**
 - CD-1 was approved Dec. 2017
- **SDUs 10-12**
 - Developing plan for executing Systems Engineering Evaluation to finalize locations of SDUs 10-12



- **Operationally closed six high-level radioactive waste tanks**
 - Tanks 18 & 19 in 2012
 - Tanks 5 & 6 in 2013
 - Tank 16 in 2015
 - Tank 12 in 2016
- **Continuing broad range of efforts to close the old-style waste tanks per Federal Facility Agreement milestones**



- 2017 Project Management Institute Award for Project Excellence - Tank 12 Closure



- **What the Work Entails**

- Excavation to expose the transfer piping
- Piping modifications to connect SWPF with the liquid waste facilities
- Once the modifications are complete the excavated area will be backfilled

- **The Major Scopes of Work**

- West Transfer Lines
- Tank 49 feed modifications
- DWPF modifications

Completing this work is imperative to SWPF startup





511-S Welding Map

Welding Map

Note: Core welds are identified in the windows. Jacket Welds are identified on the main illustration



Green Filled
 Are complete

Excellence in Project Management: Melter 2

- Over its 14-year lifetime, Melter 2 poured more than 10.4 million pounds of glassified waste, totaling 2,678 canisters



- Melter 2 reached its end of life in February 2017 - about five times longer than its design life



Excellence in Project Management: Melter 2

- Melter 2 is now encased in a 75-ton, one-inch-thick carbon steel storage box in an underground storage vault ~300 yards from DWPF

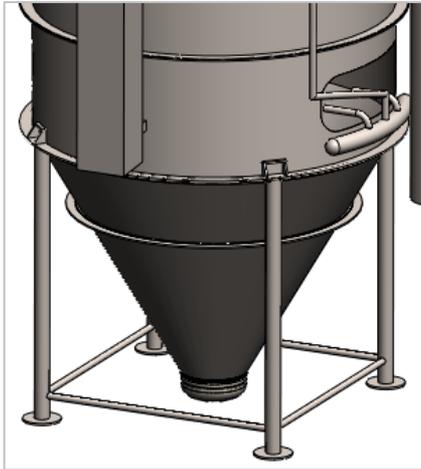


Liquid Waste Outage Significant Scope: Work Only During a Melter Replacement

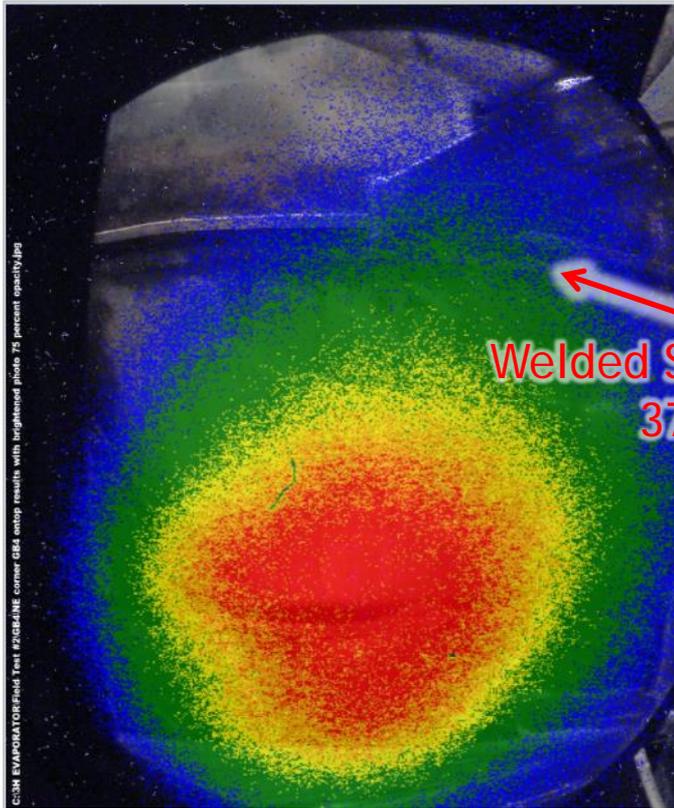
- DWPF Melter Work
 - Cell cover cleanup for Melter 2 exit route
 - Cranes & railroad refurbishment
 - Melter 2 removal
 - Melter 3 installation
 - Melter electrical systems
- DWPF Canyons - Balance of Plant
 - New Lab sample stations
 - Cooling Water System
 - Purge Air Compressors
 - Safety Grade Nitrogen System
 - Shielded Canister Transporter upgrades



- 3H Evaporator operations shut down in February 2016 after a leak was detected in the cone-shaped evaporator vessel
- The leaked material was contained in a radiological area inside the stainless steel-lined concrete evaporator cell



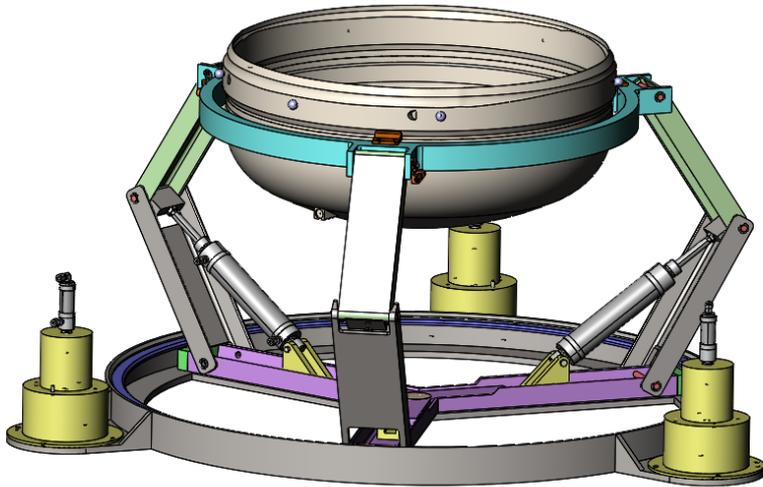


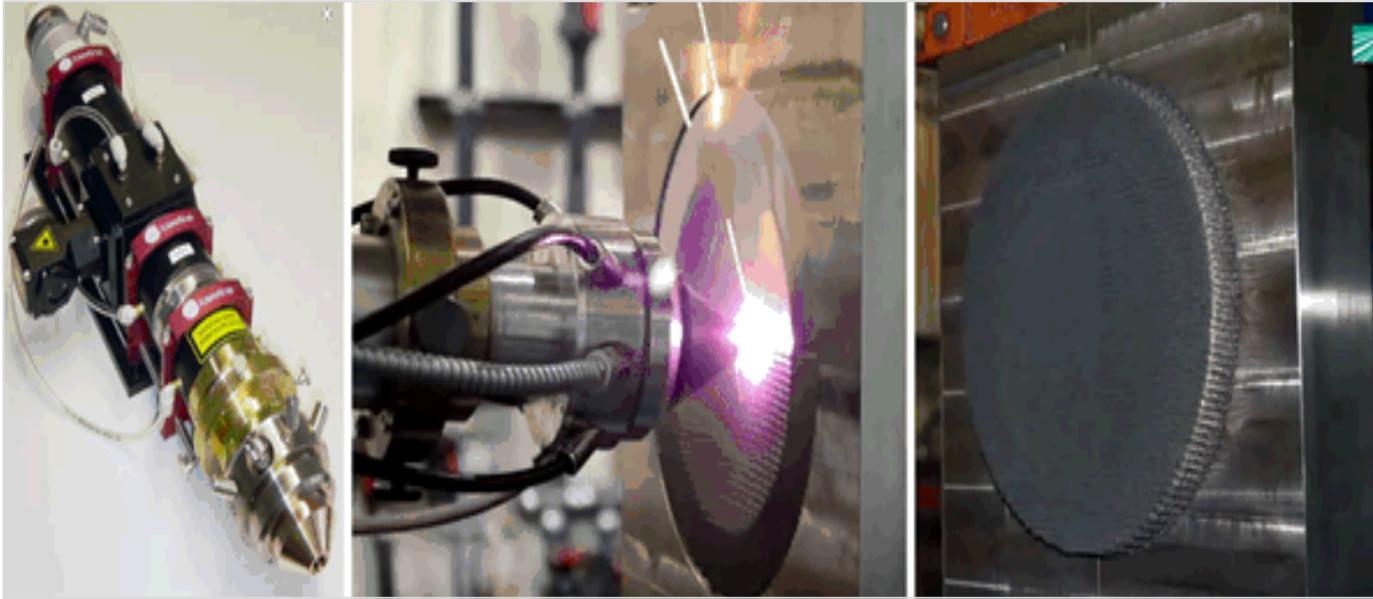


Welded Stiffening Band
37" Level

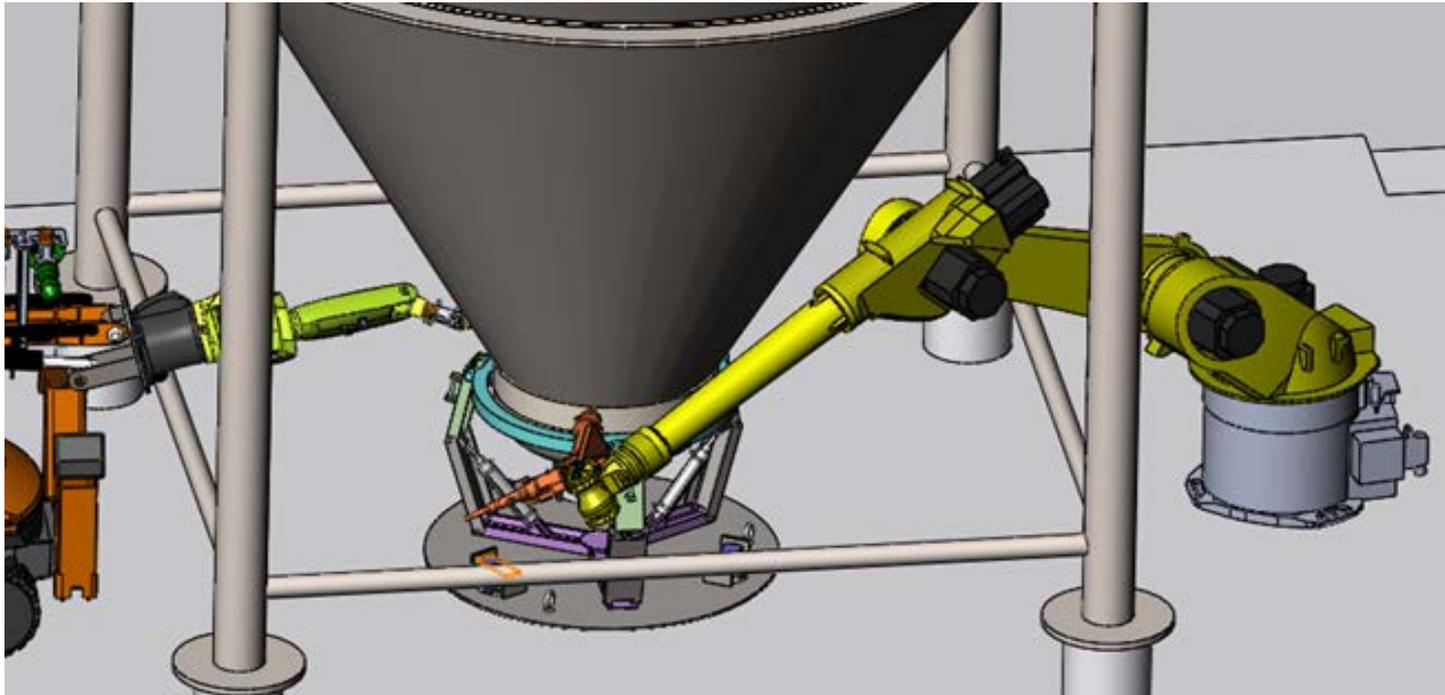


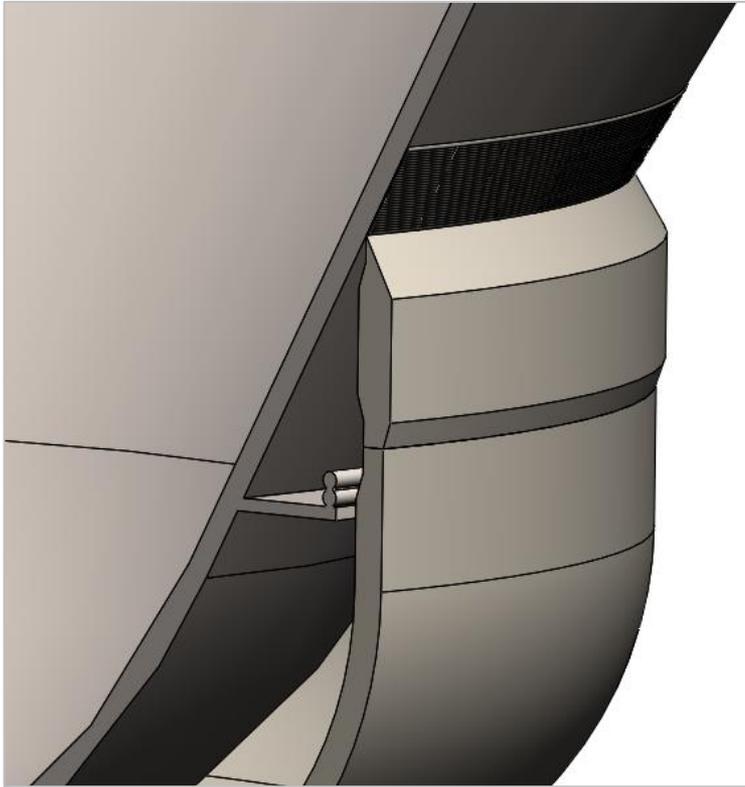
- Cap designed, produced, and tested





- The KUKA robotic arm holding the powder injection laser was controlled by robot operators outside of the cell to weld a cap to the bottom of the conical vessel





- The cap welded to the 3H Evaporator vessel successfully passed a weld quality inspection and a water test with no leaks detected
- Performed by SRR and subcontractor AREVA
- Operations restarted on December 13



3H Evaporator New Leak Sites

- Two new smaller leak sites above the cap were detected on the 3H Evaporator after restarting the vessel



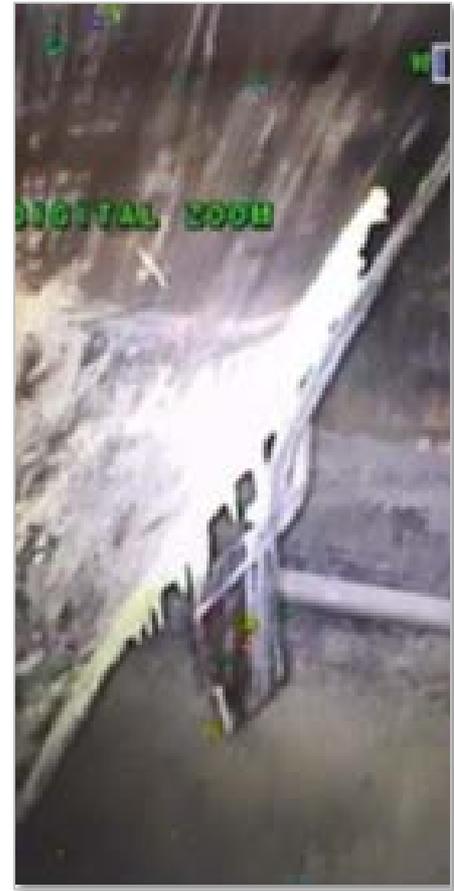
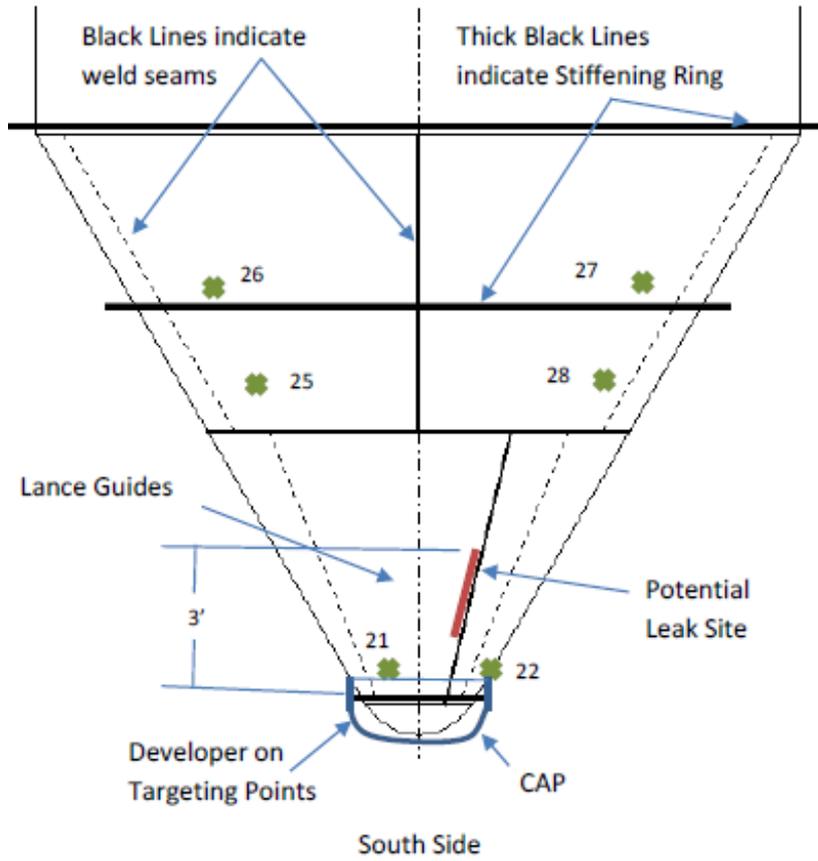
Leak Site #1



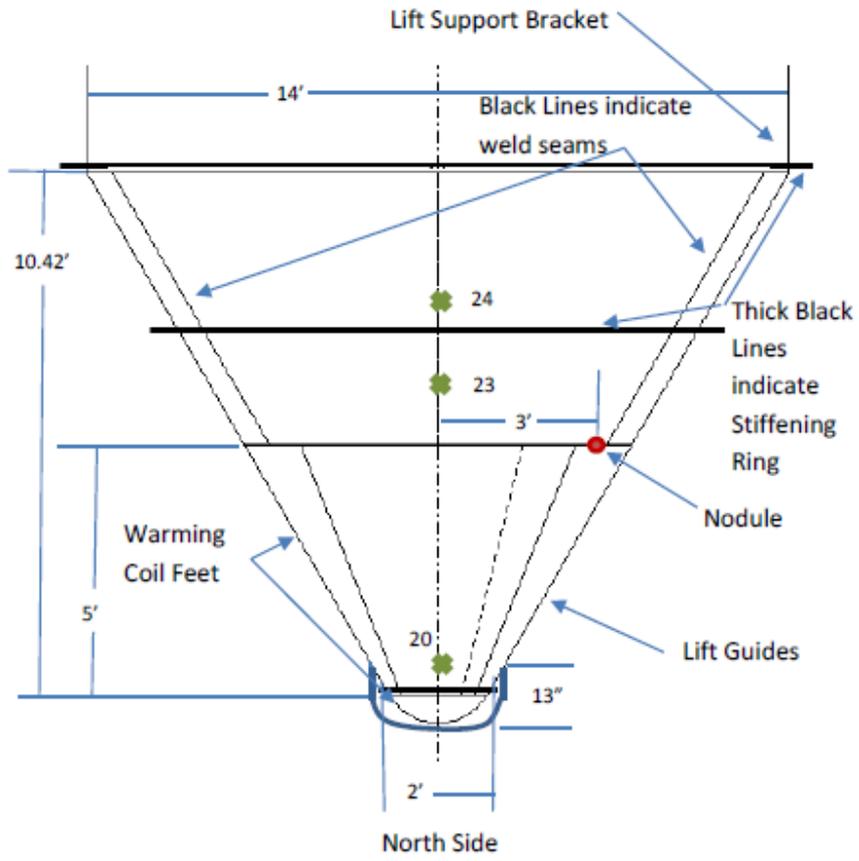
Leak Site #2



3H Evaporator New Leak Sites: Leak Site #1

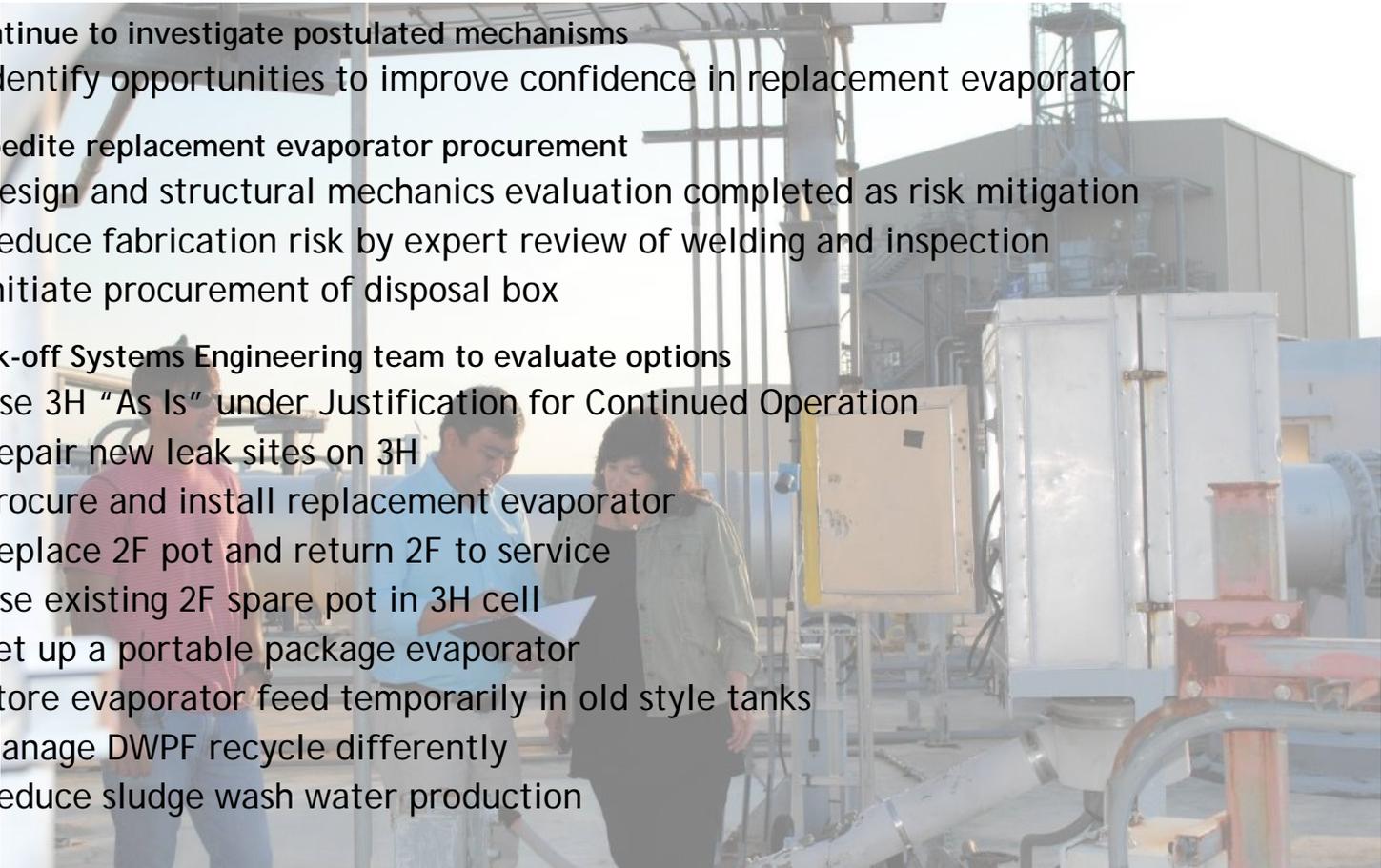


3H Evaporator New Leak Sites: Leak Site #2



3H Evaporator Path Forward

- Continue to investigate postulated mechanisms
 - Identify opportunities to improve confidence in replacement evaporator
- Expedite replacement evaporator procurement
 - Design and structural mechanics evaluation completed as risk mitigation
 - Reduce fabrication risk by expert review of welding and inspection
 - Initiate procurement of disposal box
- Kick-off Systems Engineering team to evaluate options
 - Use 3H "As Is" under Justification for Continued Operation
 - Repair new leak sites on 3H
 - Procure and install replacement evaporator
 - Replace 2F pot and return 2F to service
 - Use existing 2F spare pot in 3H cell
 - Set up a portable package evaporator
 - Store evaporator feed temporarily in old style tanks
 - Manage DWPF recycle differently
 - Reduce sludge wash water production



- First canister poured in December with new melter
- By March: All required safety basis documentation complete/full operations begin
- Readying the program for success
- Stage is set for successful new contract implementation



These advancements have and will continue to accelerate the liquid waste mission