



U.S. DEPARTMENT OF  
**ENERGY**

OFFICE OF  
**ENVIRONMENTAL  
MANAGEMENT**

# Salt Waste Processing Facility Baseline Status

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**Savannah River Site Citizens Advisory Board Meeting  
September 22, 2015**

# Purpose

- Fulfill a 2015 Waste Management Committee Work Plan topic
- To brief the Citizens Advisory Board (CAB) on the status of the Salt Waste Processing Facility (SWPF) Project.

# Acronyms

- ARP – Actinide Removal Process
- ASME – American Society of Mechanical Engineers
- CAB – Citizens Advisory Board
- CD-0 – Critical Decision 0, Approve Mission Need
- CD-1 – Critical Decision 1, Approve Alternative Selection and Cost Range
- CD-2 – Critical Decision 2, Approve Performance Baseline and Critical Decision 3A, Approve Limited Construction / Long Lead Procurements
- CD-3 – Critical Decision 3, Approve Start of Construction
- CD-4 – Critical Decision 4, Approve Start of Operations or Project Completion
- DWPF – Defense Waste Processing Facility
- DSS Line – Decontaminated Salt Solution
- LW – Liquid Waste
- MCU – Modular Caustic –Side Cesium Extraction Unit
- NGS – Next Generation Solvent
- ORR – Operation Readiness Review
- SRNL – Savannah River National Laboratory
- SWPF – Salt Waste Processing Facility
- WTL – Waste Transfer Line

# Salt Waste Processing Facility

## This critical facility will:

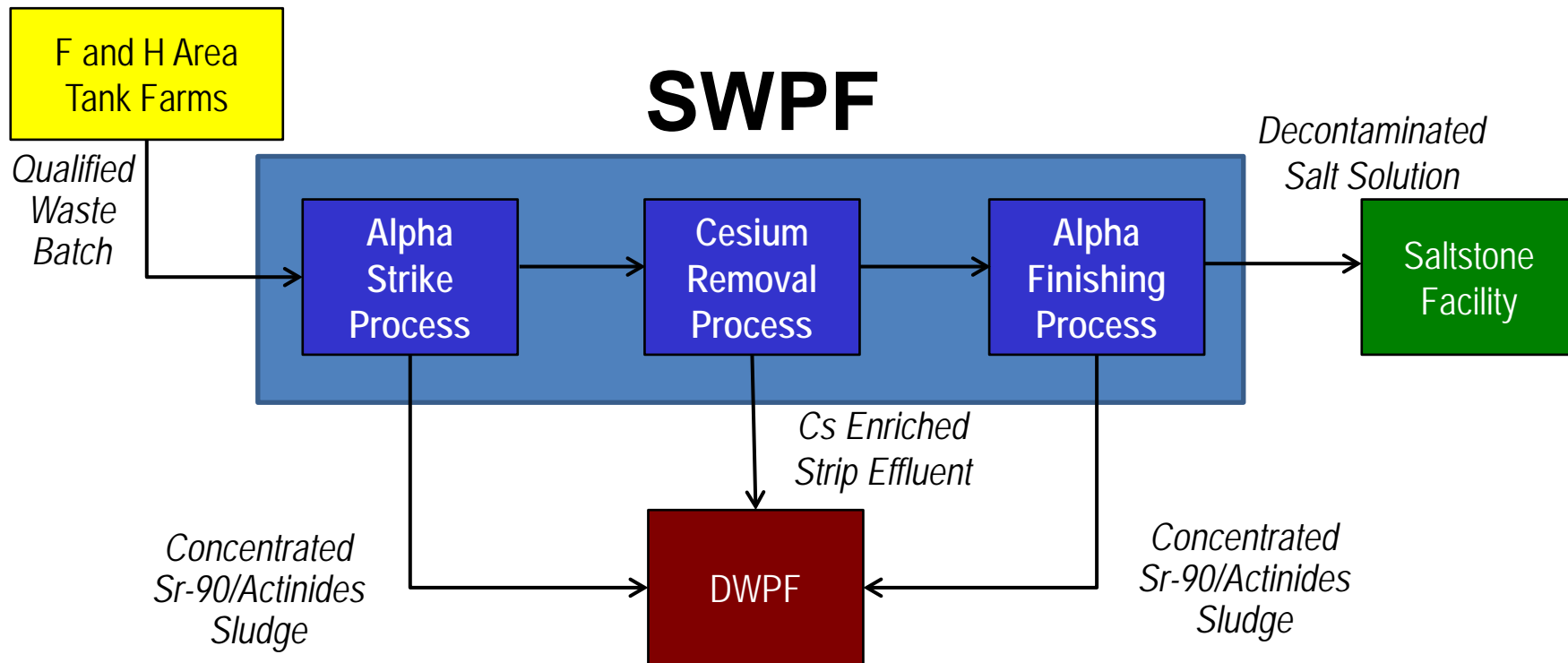
- Reduce radioactive waste volume by safely separating high-activity fraction from low-activity fraction of the radioactive liquid salt waste stored in underground tanks at the Savannah River Site and re-turning high-activity waste fraction for vitrification at the Defense Waste Processing Facility (DWPF).
- Utilize the same radioactive waste removal processes as Interim Salt Processing Facilities (Actinide Removal Process/ Modular Caustic – Side Cesium Extraction Unit (ARP/MCU) – Pilot Facility)
- Process over 90% of Tank Farm liquid radioactive waste
  - 97 million gallons after adding liquid to waste (dissolution) to facilitate processing
- Have a nominal capacity of 7.3 million gallons per year



## PARSONS

Parsons is the contractor for the SWPF project [design, construction, commissioning and operation for one year ]

# SWPF Process

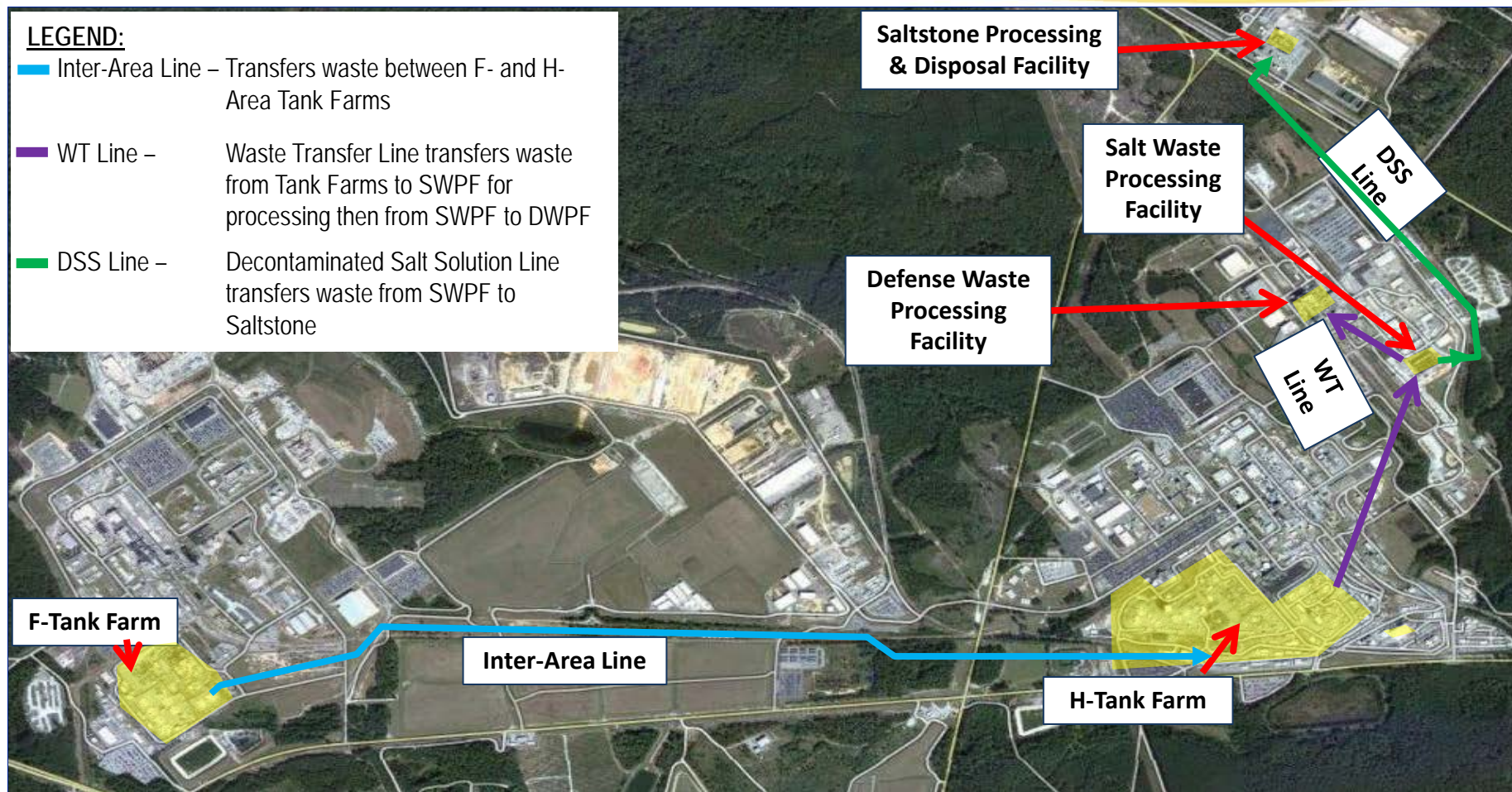




# Savannah River Site Liquid Waste System

## LEGEND:

- Inter-Area Line – Transfers waste between F- and H-Area Tank Farms
- WT Line – Waste Transfer Line transfers waste from Tank Farms to SWPF for processing then from SWPF to DWPF
- DSS Line – Decontaminated Salt Solution Line transfers waste from SWPF to Saltstone



# Waste Transfer Line Installation



April 2014

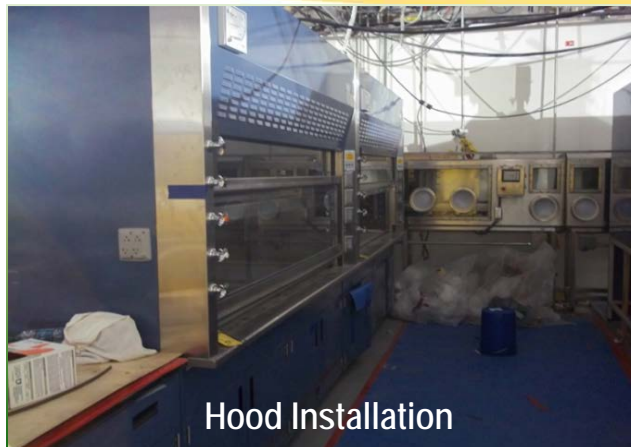


September 2015



# SWPF Laboratory

- SWPF Laboratory provides full capability to support plant operations for both Waste Acceptance compliance and process chemistry control
- Laboratory occupies approximately 8,000 square feet of floor space
- A shielded hot cell with 4 work-stations provides capability for sampling and processing high curie content samples.
- 11 glove-box/radio-hood lines contain analytical equipment for organic, inorganic and radiochemistry analysis needs.
- A fully contained transfer system allows safely moving samples from the hot cell to any the glove-box/radio-hood lines and between lines as needed.
- A co-located repair area is included to maintain hot cell manipulators.



Hood Installation



Laboratory Gloveboxes



# SWPF Construction Progress

Room 311 with Bridge Crane 101



SWPF Filter Loading Dock



HEPA Filters in Central Processing Area



Compressor Building

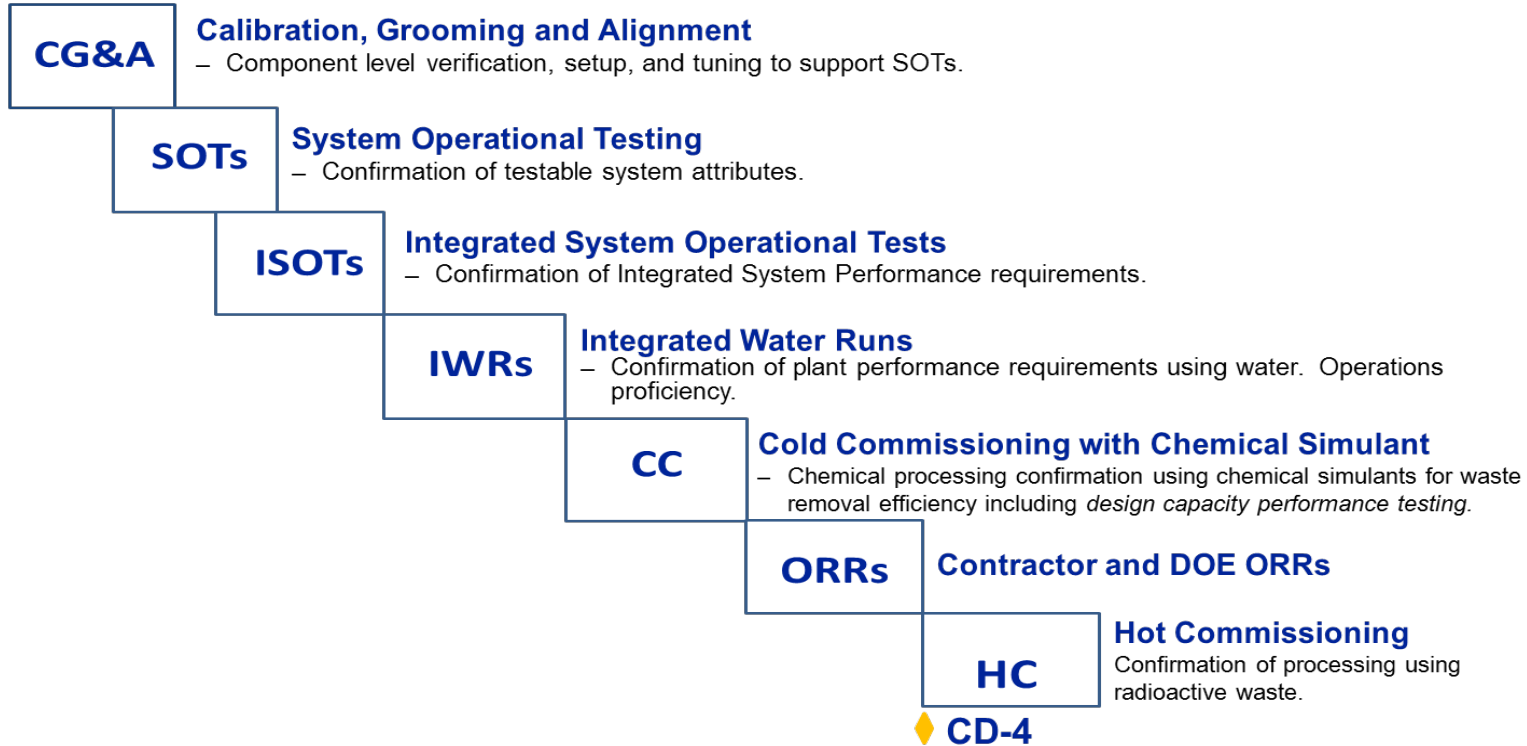


# Technology Center Laboratory Expansion



# SWPF Testing Activities

## ◆ System Turnover





# Liquid Waste Scope Required to Start SWPF

## Blend and Feed

- Provide raw salt solution (RSS) feed for SWPF
- Equip one existing tank with blending capability
- Equip one existing tank as the SWPF Feed Tank
- Provides transfer piping for RSS transfers to SWPF



## Laboratory Waste Handling

- Improve method to remove higher curie waste and material from DWPF Lab
- Approved design input documents and issued Preliminary Material Handling Diagram
- Performed waste characterization calculation for future waste



## East (ETL) and West (WTL) Transfer Lines

- Tie-ins of new underground SWPF piping to existing Liquid Waste piping
- ETL tie-in to provide path from SWPF to H-Tank Farm (HTF)
- WTL tie-ins provide path between SWPF, HTF, and DWPF
- Significant outage to execute scope
- Soil borings completed



## DWPF Modifications

- Allow receipt of high activity effluent streams from SWPF
- Expanding glass composition to support MST Strikes at SWPF Complete Consolidated Hazards and Documented Safety Analyses
- Temperature interlock and automated shut off of key equipment within 511-S



- Construction Completion
  - System Turnovers from Construction to Testing
  - Declaration and Acceptance of Construction Completion
- Preparations to initiate System Testing / Commissioning
  - Development and Approval of System Test Procedures
  - Management Self Assessment to ensure Readiness to Test
  - Operations Staffing / Training
- Alignment of DOE Oversight for Testing and Commissioning



# Looking to the Future

- High degree of technical confidence
- Maintain safety, cost and schedule performance
- Integrate NGS and High Sodium processing to enhance throughput
- Optimize facility operability
- Maintain integration with the Liquid Waste Program
- Minimize Liquid Waste lifecycle costs – full solution to SRS Tank Closure



Testing on Full-Scale Equipment at  
Technology Center in Aiken



## The SRS is poised for success with a complete Liquid Waste solution path

- *DOE-SR* has established a sound and integrated clean-up strategy
- *SRR* has demonstrated the capability to clean and close tanks, prepare and make glass at high capacity, and safely prepare and transfer waste feeds
- *SRNL* has supported success through technology innovation, technology deployment and operations optimization
- *Parsons* is ready to deliver the technically mature and high capacity SWPF that is the keystone to the next major DOE-EM clean-up success