

# Salt Waste Processing Overview

**Pamela Marks**

SWPF Federal Project Director

Savannah River Site

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Savannah River Site





# Salt Waste Processing Facility



## This essential facility will:

- Reduce radioactive waste volume requiring vitrification
- Utilize the same actinide and cesium removal unit processes as Interim Salt Processing Facilities (ARP/MCU)
- Process over 90% of Tank Farm liquid radioactive waste (97 Mgal. after dissolution)
- Have a nominal capacity of 6 – 9 million gallons per year

## PARSONS

Parsons is the contractor for the SWPF project  
(design, construct, commission and operate for one year)

Savannah River Site



# Liquid Waste System Today

## Legend:

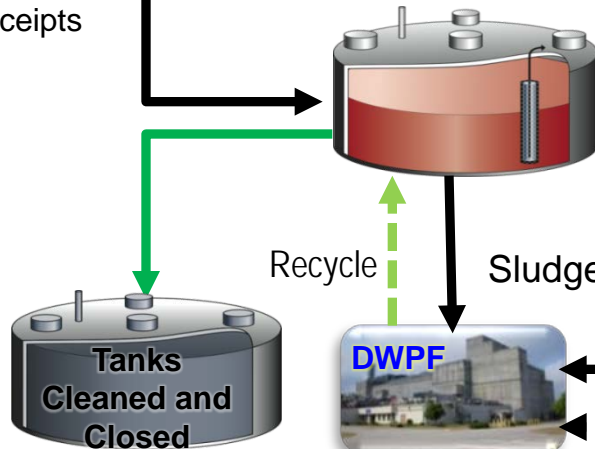
- ARP Actinide Removal Process
- DWPF Defense Waste Processing Facility
- MCU Modular Caustic Side Solvent Extraction Unit
- SWPF Salt Waste Processing Facility

**SWPF**

- ✓ Designed to Process more than 6 millions gallons per year
- ✓ Cs Decontamination factor > 40,000
- ✓ Technology is very mature
- ✓ No open DNFSB issues



H-Canyon Receipts



Recycle

Salt Waste

Sludge Waste

Radionuclides



**SWPF**  
(under construction)



Glass Waste Storage



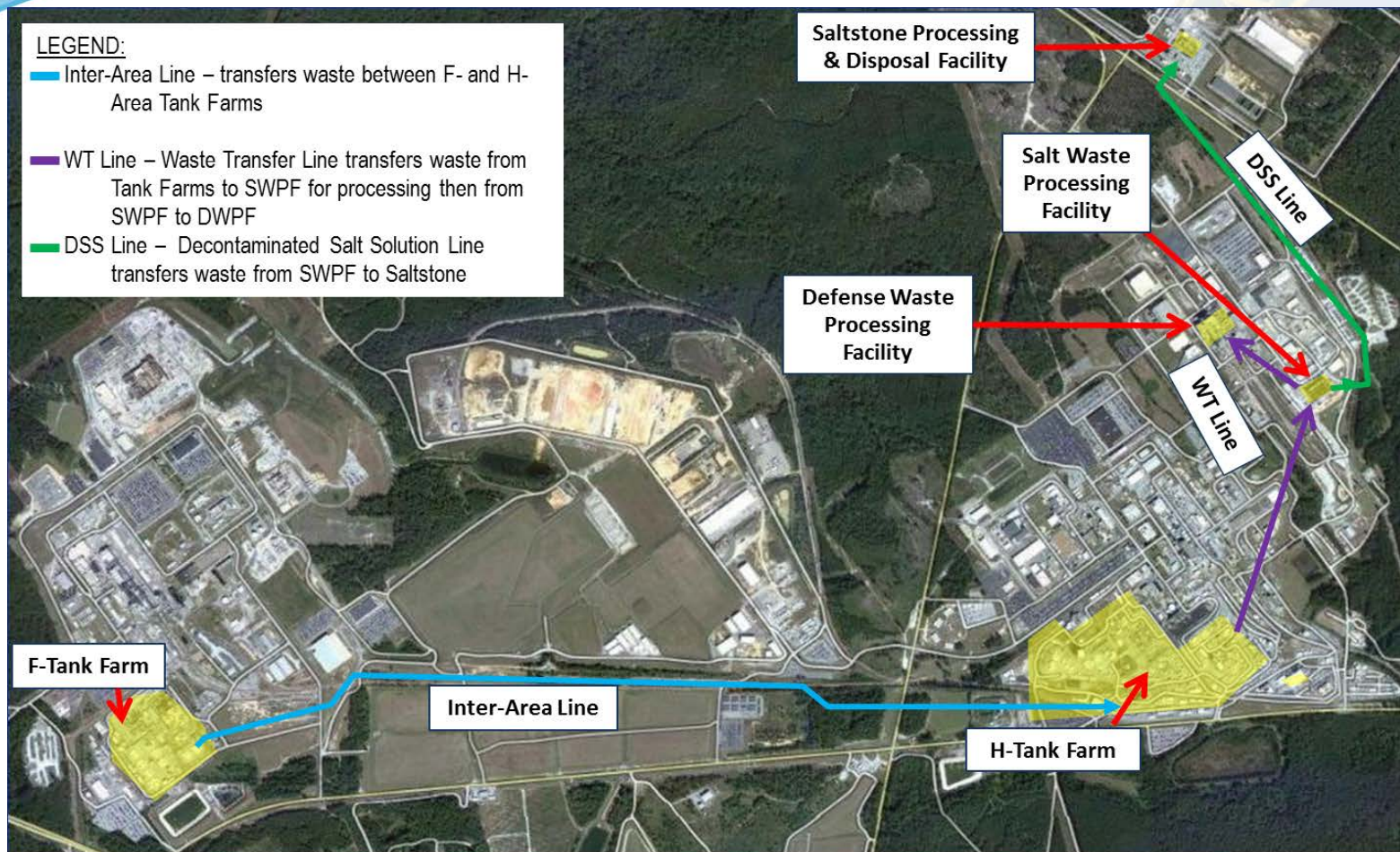
Saltstone Disposal Facility



Inert chemicals

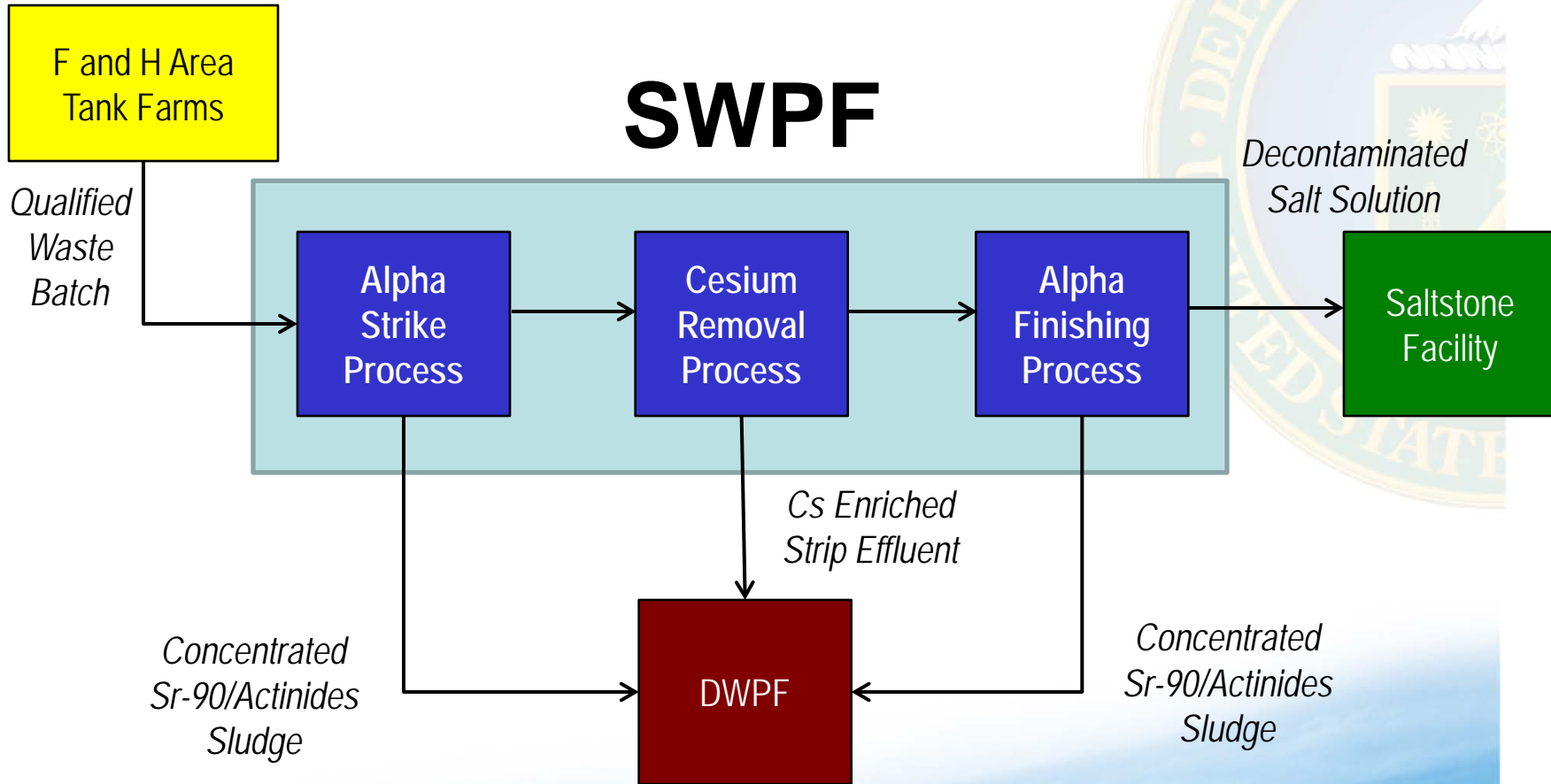


# Waste Transfers





# SWPF Process





# Salt Waste Processing Facility

## Design Basis Requirements Summary

- Hazard Category-2 Non-Reactor Nuclear Facility
- Design Life of 40 Years
- Design Processing Throughput ~ 7.3 Million Gallons per Year
- Hot Commissioning and 1 Year of Operations

## Construction Quantities

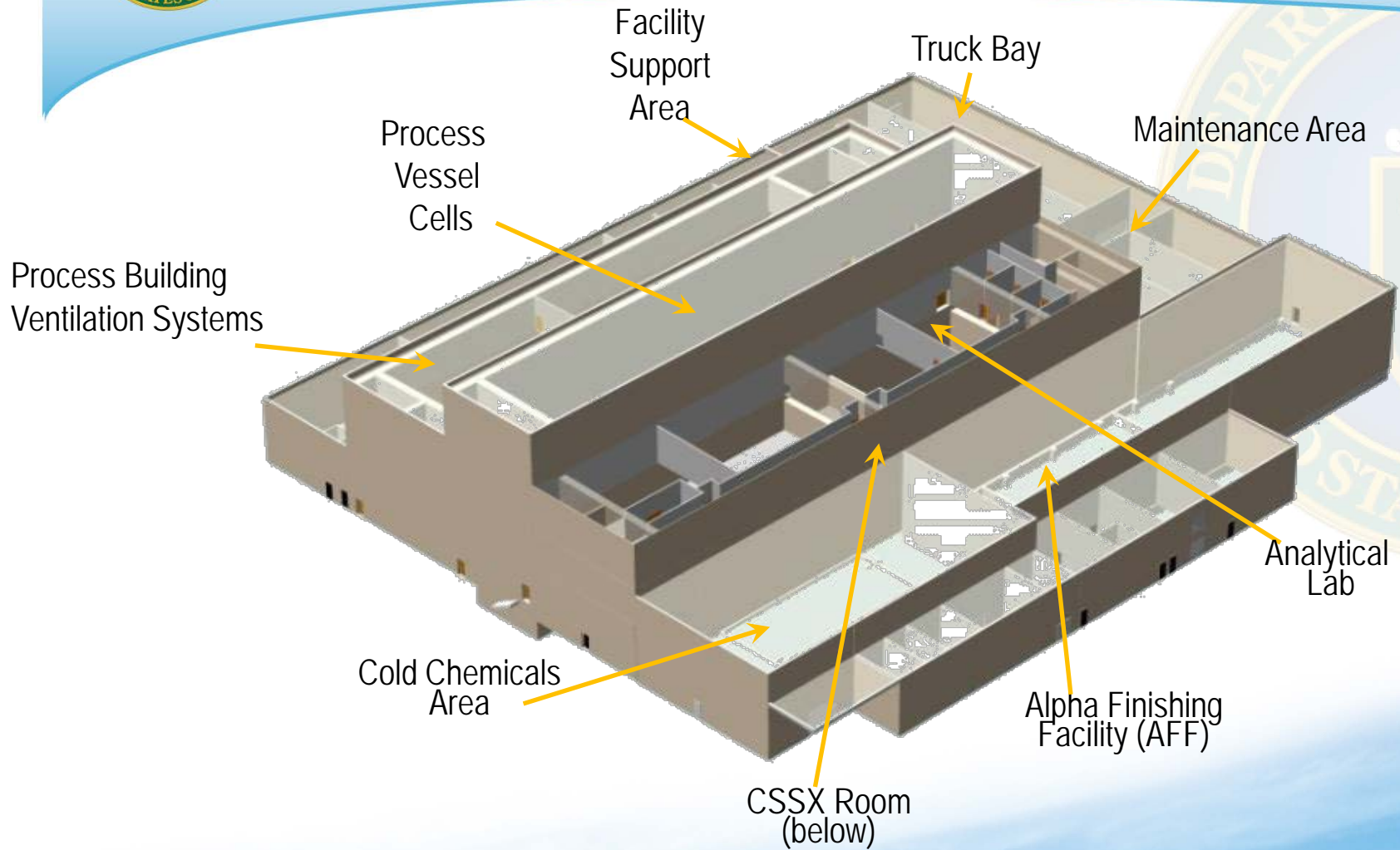
- 114 Vessels, Tanks, HXs, Filters, Engineered Items
- Concrete: 45,600 yd<sup>3</sup>
- Structural Rebar and Steel: 5,500 tons
- Conduit: 115,000 linear feet
- Wire and Cable: 690,000 linear feet
- Piping: 120,000 linear feet
- 4,600 valves

## Physical Design Summary

- 34 Acre J-Area Site Adjacent to SRS S-Area
- Facility Size: 83,300 ft<sup>2</sup>
- Reinforced Concrete - 8 foot thick Base Mat for Central Processing Area (NPH Category PC-3)

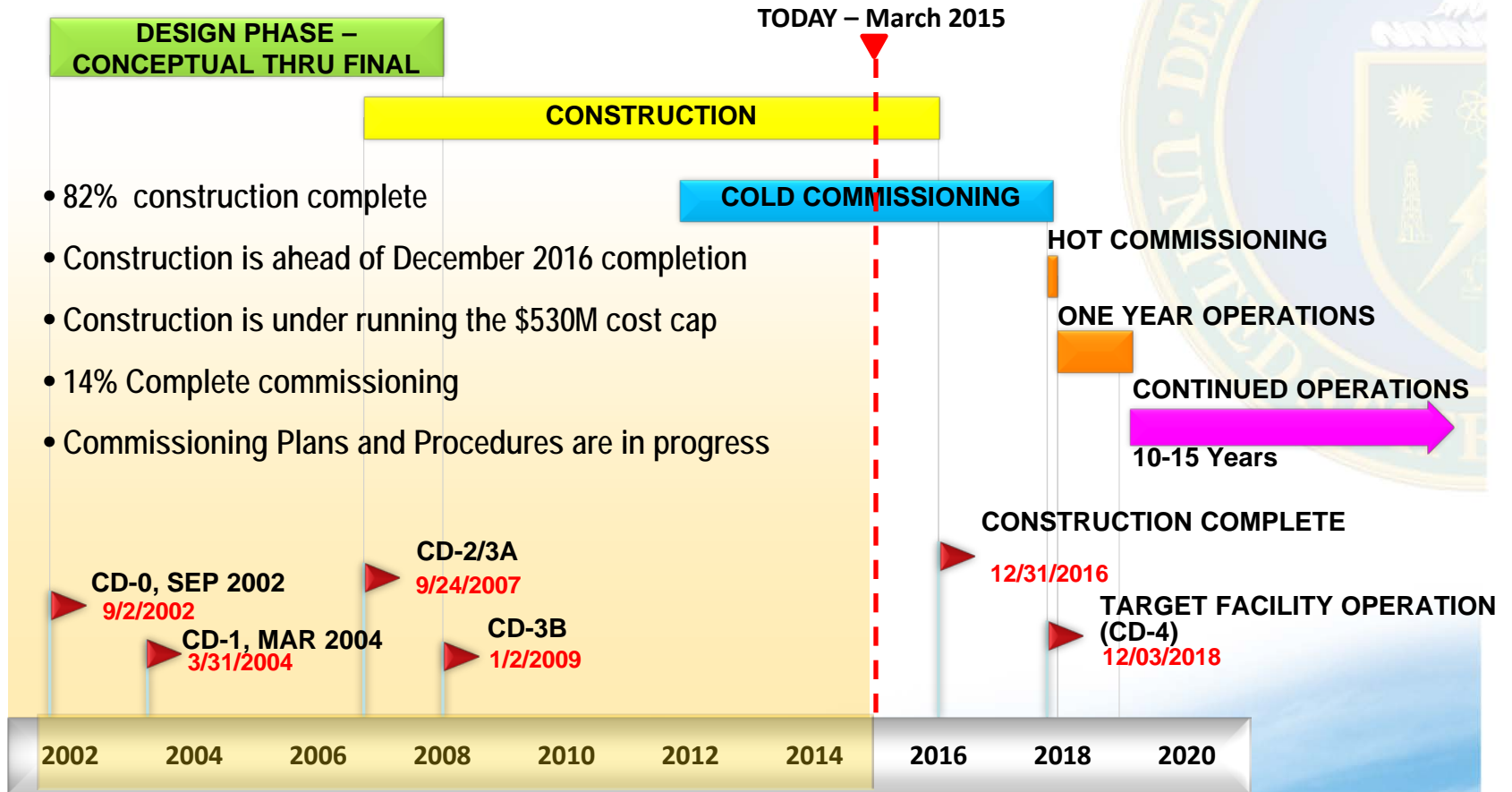


# SWPF Process Building Layout





# SWPF Project Milestones







# Commissioning Program

MSA-1

MSA-2

Cold

MSA-3

CD-4

System Testing  
(Water)

Commissioning  
(Chemical)

Contractor ORR /  
DOE ORR

Hot  
Commissioning

- Conduct of Testing
- Conduct of Operations/Procedures
- Cognizant System Engr. Program
- Configuration Management
- Quality Assurance
- Maintenance
- Work Planning and Control
- Industrial Safety, Environmental Protection

- Chemical Safety/Industrial Hygiene
- Fire Protection
- Training and Qualification
- Waste Management
- Performance Testing (with simulants)

- Emergency Management
- Nuclear Safety  
(DSA/TSR/SER)
- Radiation Protection

- Performance Testing
- Radioactive Shielding
- Removal Efficiency
- Waste Acceptance Criteria
- Environmental Testing



# Cold Commissioning Performance

- Demonstrate the ability to process at a throughput rate of 7.3 million gallons per year.
- Demonstrate integrated operability of the facility and plant systems using non-radioactive waste simulants and process chemicals (including MST and actual solvent).
- Demonstrate the ability to produce waste products that are within the established limits of the Waste Acceptance Criteria (WAC) and/or Documented Safety Analysis (DSA) of the receiving facilities (i.e., Defense Waste Processing Facility and Saltstone Facility).
- Successful Cold Commissioning - tests will be conducted during Cold Commissioning to validate compliance:
  - *Chemical sampling to assess product compliance*
  - *Peak throughput performance testing*
  - *Other Cold Commissioning Performance Testing (off-normal conditions, non-routine operations, maintenance, and environmental testing)*



# Hot Commissioning Performance Verification

- Hot Commissioning is planned to commence in 2019.
- Demonstrate SWPF is ready to commence unrestricted hot operations.
- All aspects of integrated facility operation will be demonstrated including radioactive waste feed receipt from the Low Point Pump Pit, and waste product transfer to the Saltstone Processing Facility (SPF) and the Defense Waste Processing Facility (DWPF).
- All products and secondary wastes shall be analyzed to confirm operation within the WAC of the receiving facility.
- Hot Commissioning Testing will be performed to verify those aspects of plant design that could not be fully verified in cold commissioning (e.g., shielding, actinide removal, and environmental testing).



## SWPF Interface Integration

- SWPF is a key element of an integrated and successful Liquid Waste Program.
- Integration between SWPF and key Liquid Waste System interfaces for feed and effluent is critical to the success of the DOE-SR clean-up mission.
- Key Interface Challenges include:
  - Accurate and agile system planning
  - Synchronization of site and project schedules
  - Support of site SWPF feed preparation pre-requisite activities
  - Support of disposal vaults for SWPF effluent
  - High capacity salt processing pre-treatment with no technical issues