SRMC-CWDA-2024-00001

## Waste Tank Closure Process – Initial Stages

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## Acronyms



- ALT Alternate
- CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
- CGCP Consolidated General Closure Plan
- CM Closure Module
- CTS Concentrate Transfer System
- DOE U.S. Department of Energy
- DWPF Defense Waste Processing Facility
- EPA U.S. Environmental Protection Agency
- ESD Explanation of significant Difference
- FCR Final Configuration Report
- FDB F-Area Diversion Box
- FFA Federal Facilities Agreement
- FTF F-Area Tank Farm
- GWSB Glass Waste Storage Building
- HDB H-Area Diversion Box
- HTF H-AreaTank Farm
- LWTRSAPP Liquid Waste Tank Residuals Sampling and Analysis Plan
- LWTRSAPP Liquid Waste Tank Residuals Sampling-Quality Assurance Plan

- MCi millions of curies
- Mgal millions of gallons
- NEPA National Environmental Policy act
- NRC U.S. Nuclear Regulatory Commission
- OU Operable Unit
- pCi/L pico curies per liter
- PCWR Preliminary Cease Waste Removal
- PO Performance Objective
- RCRA Resource Conservation and Recovery Act
- RVW Review
- S&A Sampling and Analysis
- SCDHEC South Carolina Department of Health and Environmental Control
- SDUs Saltstone Disposal Units
- SPF Saltstone Production Facility
- SRMC Savannah River Mission Completion (current Liquid Waste Contractor)
- SRS Savannah River Site
- STD Standard
- SWPF Salt Waste Processing Facility
- WD/I Walkdown/Inspection



Provide an overview of the Savannah River Site (SRS) Liquid Waste tank closure process with a focus on the new Preliminary Cease Waste Removal ("PCWR") Federal Facility Agreement (FFA) milestones.

## **SRS Liquid Waste Program**



- Store, retrieve, process, treat, and dispose of legacy tank waste
- 43 active waste tanks, 33.2 million gallons of radioactive waste
- Four End States
  - Operational Tank Closure (Removal from Service)
  - Vitrified high-level waste canisters in Glass Waste Storage Buildings (GWSBs) 1 & 2
  - Low-level waste in Saltstone Disposal Units (SDUs)
  - Deactivate and flush operating facilities to enable safe setup for decommissioning activities

#### Key processing and treatment facilities

- Defense Waste Processing Facility (DWPF)
- Salt Waste Processing Facility (SWPF)
- Saltstone Production Facility (SPF)

#### Saltstone Disposal Units







## **SRS Composite Inventory**





## Liquid Waste Program



#### **SRS Liquid Waste Facilities**



### SRS Liquid Waste Mission Progress to Date



#### Sludge batches processed:

#### 9 of 19 projected



#### Tanks closed: 8 of 51



#### Salt batches processed: 8 of 102 projected



#### Canisters: 4,400 total of 8,113 projected



2023-12-31

## **Tank Farms**





## **Closure of Tank Farms**



Cleaning/Grouting of Waste Tanks and Ancillary Structures

F-Area Tank Farm Today



#### Tank Closures

- Tanks 17F & 20F operationally closed in 1997
- Tanks 18F & 19F operationally closed in 2012
- Tanks 5F & 6F operationally closed in 2013
- Tank 16H operationally closed in 2015
- Tank 12H operationally closed in 2016



#### **Closure Cap Concept**



### 2022 High Level Waste Tank **Milestones Agreement**

- In December 2022, the U.S. Department of Energy (DOE), South Carolina Department of Health and Environmental Control (SCDHEC), and U.S. Environmental Protection Agency (EPA) signed the 2022 High Level Waste Tank Milestones Agreement, which has since been incorporated into the FFA
  - Updated "Common Values and Goals"
  - Among other things, provides milestone dates for Preliminary Cease Waste Removal (i.e., risk reduction) and new Operational Closure dates for the remaining Type I, II, and IV waste tanks.

1	evel Waste Tank Milestones Agr	reement		
In December 20, 2022, the office (SN), the South Carol Inited States Environment avannah River Stie (SRS) F intered into in November 1 with the avceptions of Para appendix L (Incorporated b and Milestones Agreemen e incorporated into the FF ctions are consistent with loads, included as Attachm vaste and Icking tanks wit	Attachment A SRS Liquid Waste Program Common Values and Goals (2022 – 2037)			
clusion of FFA Milestones	VALUES	rogress, an Schedule for Remaining Non-Compliant Tanks		
The Parties agree to incl A Appendix L, except for ppendix L, incorporated in	<ol> <li>Maintain transparency w on program progress, an</li> <li>Ensure DOE's strategy as</li> </ol>			
aragraphs 9.b and 18 from aragraph 9.b states, "The I ank, DOE shall involve SCD	SCDHEC permitting proc 3. Maximize the amount of ultimate disposal out of	Milestone Date	Preliminary Cease Waste Removal	Operational Closure
rocesses to explain the act	dicanase onposar buy or		(# of Tanks)	(# of Tanks)
eps. DOE shall consider a xt stage. These interaction	<ol><li>Limit disposal of curies of</li></ol>	12/31/2023	0	0
agreed to by the particip	achievable.	12/31/2024	1	0
este removal to be compl cumentation to SCDHEC	GOALS (in priority order)	12/31/2025	3	0
moval activities may ceas	1. Reduce risk to the enviro	12/31/2026	2	0
ragraph 18 states, " In co	of the liquid waste progr	12/31/2027	2	0
rvice due by March 9 <sup>th</sup> of e status of bulk waste and	2. 2. 4	12/31/2028	0	3
erm Performance Assessm	<ol> <li>Reduce operational and tanks.</li> </ol>	12/31/2029	2	0
osure of groups of tanks is	in the second second second	12/31/2030	1	2
agan National Defense A	<ol> <li>Reduce operational and program total life cycle.</li> </ol>	12/31/2031	0	3
and the second se	program menter.	12/31/2032	0	1
and the second se		12/31/2032	0	2
and the second	4. Complete waste remova	10/01/0000		2
a second s	with a risk-based priority	12/31/2033		16
and the second	with a risk-based priority followed by remainder o	12/31/2034	1	0
and the second se	with a risk-based priority		1	0
and the second	with a risk-based priority followed by remainder o	12/31/2034		un .
eagan National Defense A	with a risk-based priority followed by remainder o	12/31/2034 12/31/2035	1	0



## **Tank Closure Process (Previous)**





## **Tank Closure Process (Current)**





## **Pathway to Closure**





#### SRS Tank Closure Regulatory Roadmap

## **Pathway to Closure**





#### SRS Tank Closure Regulatory Roadmap

### **Pathway to Closure**





### **Preliminary Cease Waste Removal**





#### Legend:

- ALT Alternate CM Closure Module
- DHEC South Carolina Department of Health and Environmental Control
- DOE U.S. Department of Energy
- EPA U.S. Environmental Protection Agency
- S&A Sampling and Analysis
- STD Standard

The three agencies agree that, based upon the described qualitative assessment, there is reasonable assurance that performance objectives will be met, and it is appropriate to suspend waste removal activities and enter the Sampling and Analysis phase of the tank closure process.

### **Performance Objectives / Demonstration**



#### Consolidated General Closure Plan

- Performance Objectives
  - The State Primary Drinking Water Regulations for radionuclides (i.e., 4 mrem/yr beta-gamma dose, 15 pCi/L total alpha concentration, and 5 pCi/L total Ra-228 + Ra-226)
  - The State Primary Drinking Water Regulations for nonradiological inorganic constituents.
- In addition, demonstration that it is not technically practicable, from an engineering perspective, to continue waste removal activities
  - Diminished effectiveness of technology used
  - Not practicable to deploy alternate technology

## **FFA Commitments/Tank Status**





9 (10

12 3:4 🜉

(13)

15

17

HDB2

14

HDB7

38 39 40 41

48 49

50 (51

INOT TO SCALE

(43)

242-16H (2H) Evaporator

System

(42)

31 30

242-18H

New CTS

Legend

242-3H Old CTS

242-H (1H)

System

Evaporato

Type I Storage Tank

Type II Storage Tank

Type III Storage Tank

Type IIIA Storage Tank

Tank Farm Boundary

Pump Pit

Catch Tank Evaporator System Encloses Area of Same

Diversion BoxCTS Pump Pit

29

HDB4

22 21

24 23

HDB8-

HDB3

#### Status of non-compliant tanks

- Eight (8) closed
  - Tanks 5F, 6F, 17F-20F, 12H and 16H
- Three (3) w/ongoing waste removal
   Tanks 9H, 10H and 15H
- Five (5) w/ongoing field modifications
   Tanks 2F, 3F, 4F, 11H and 14H
- One (1) w/design activities initiated
   *Tank 1F*
- Seven (7) supporting waste removal and processing (e.g., hub tank, recycle receipt)
   *Tanks 7F, 8F, 13H and 21H-24H*



Milestone Date	Preliminary Cease Waste Removal	Operational Closure (№ of Tanks)	
	(№ of Tanks)		
12/31/2023			
12/31/2024	1		
12/31/2025	3	,a	
12/31/2026	2	-	
12/31/2027	2	-	
12/31/2028	-	3	
12/31/2029	2	-2	
12/31/2030	1	2	
12/31/2031	-	3	
12/31/2032	-	1	
12/31/2033		2	
12/31/2034	1		
12/31/2035	1	<u>_</u> 20	
12/31/2036	1	1	
12/31/2037	2	4	

Schadula for Ramaining Non-Compliant Tanks









# **Questions** ?