



U.S. DEPARTMENT OF  
**ENERGY**



## Presentation to the SRS Citizens Advisory Board

### Status of Interim Salt Processing

July 24, 2018

Patricia Suggs  
Sr. Program Manager  
Waste Disposition Programs

# Purpose

---

Provide FY18 update to CAB on Interim Salt Processing,  
also known as the “Actinide Removal Process (ARP) /  
Modular Caustic Side Solvent Extraction Unit (MCU)” and  
progress toward Tank Closure Cesium Removal (TCCR)  
Technology Demonstration

# Agenda

---

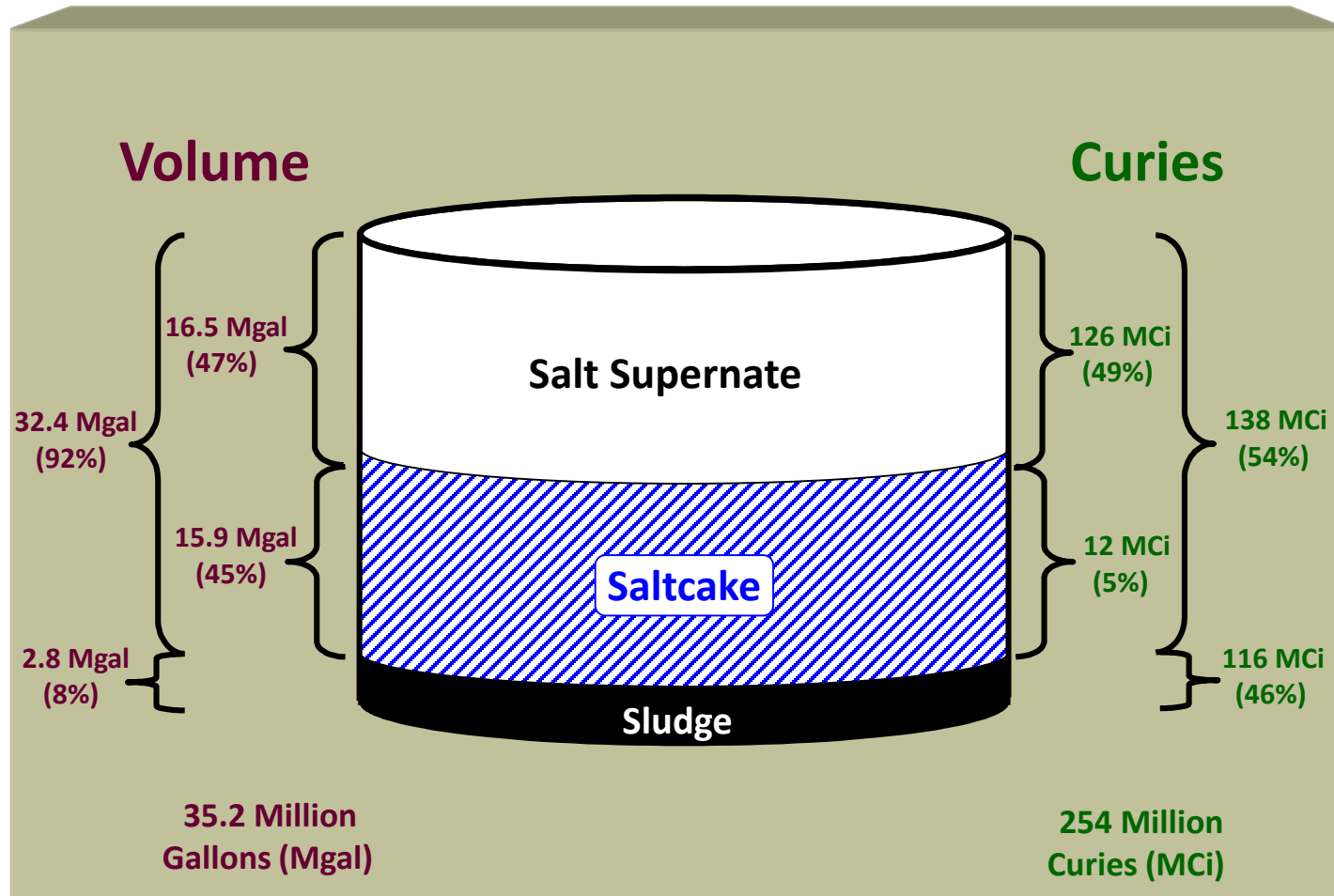
- Acronym List
- Savannah River Site Liquid Waste and Material Flow Path
- ARP/MCU Operational Performance in FY18
- Summary

# Acronyms

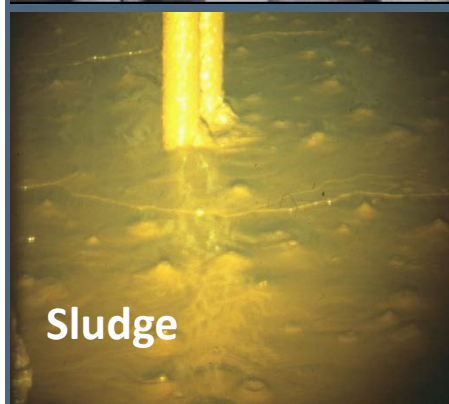
---

ARP	Actinide Removal Process
CSSX	Caustic Side Solvent Extraction
DF	Decontamination Factor
DSS	Decontaminated Salt Solution
DWPF	Defense Waste Processing Facility
GWSB	Glass Waste Storage Building
MCU	Modular Caustic Side Solvent Extraction Unit
MST	MonoSodium Titanate
NGS	Next Generation Solvent
SRNL	Savannah River Nuclear Laboratory
SRR	Savannah River Remediation
SRS	Savannah River Site
SWPF	Salt Waste Processing Facility
TCCR	Tank Closure Cesium Removal

# Salt Waste to be Processed

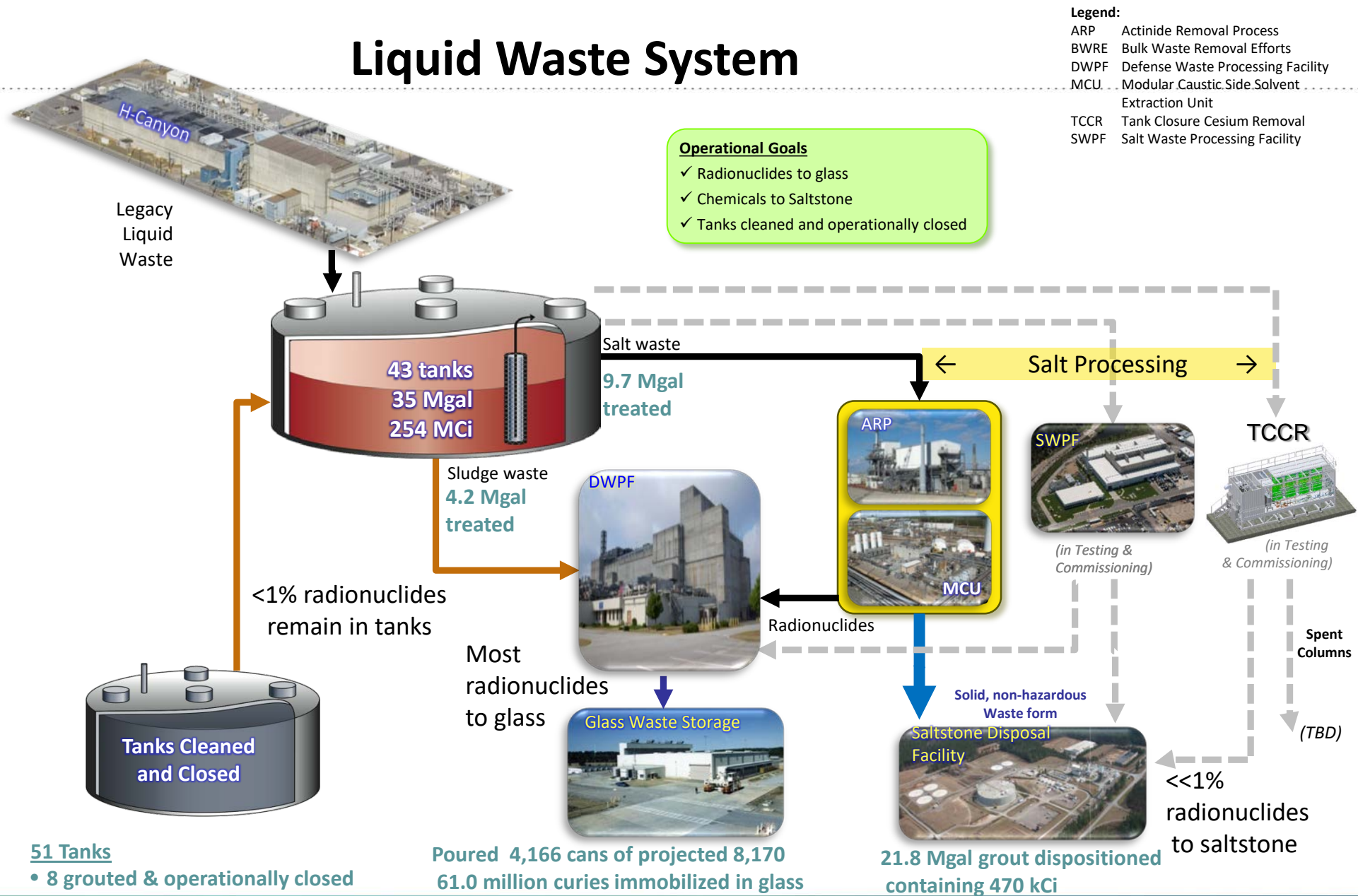


Inventory values as of 2018-05-31



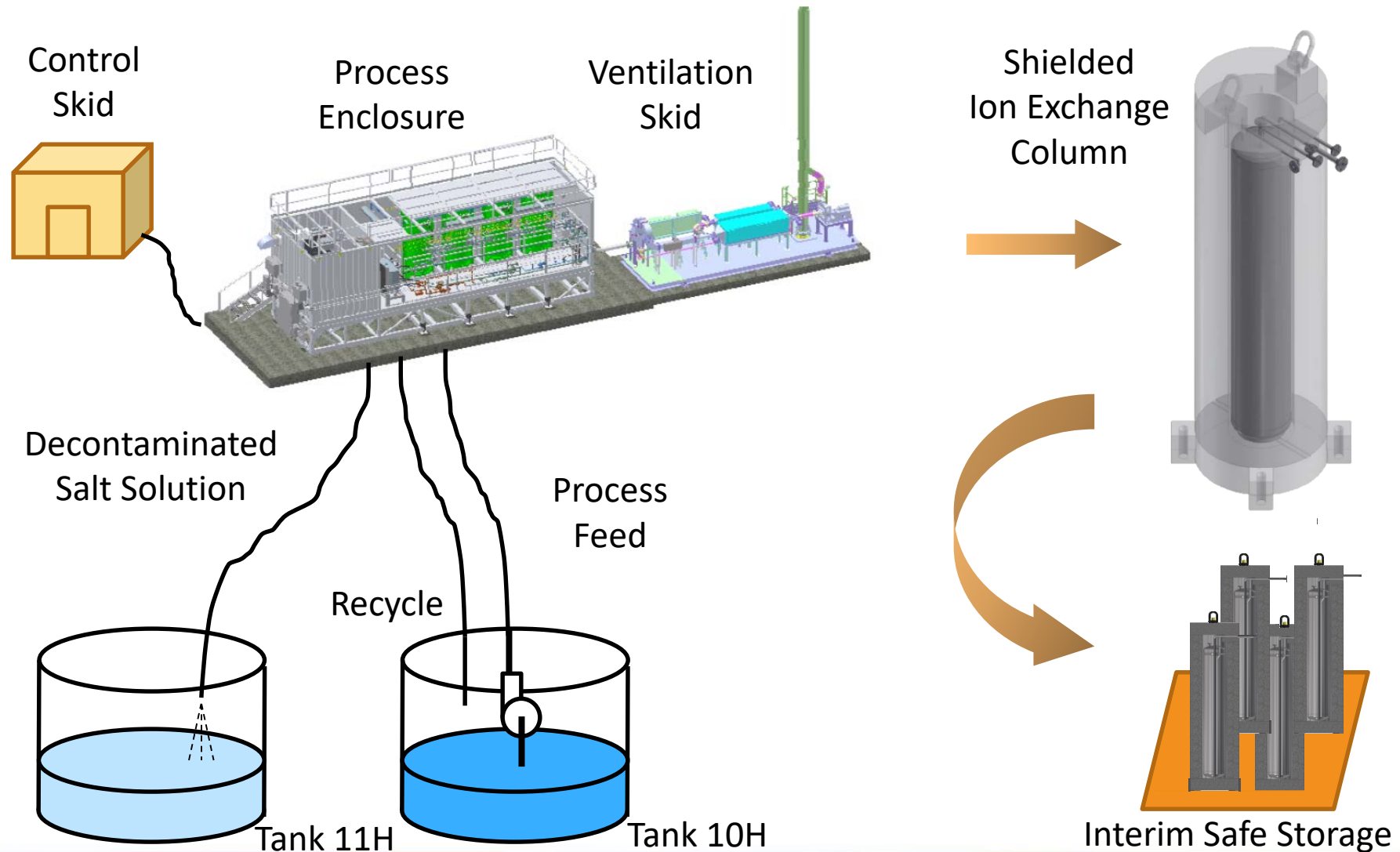


# Liquid Waste System



2018-05-31

# TCCR Process Overview

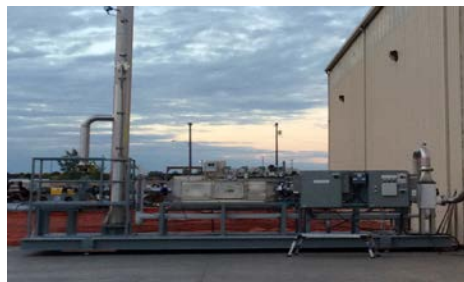




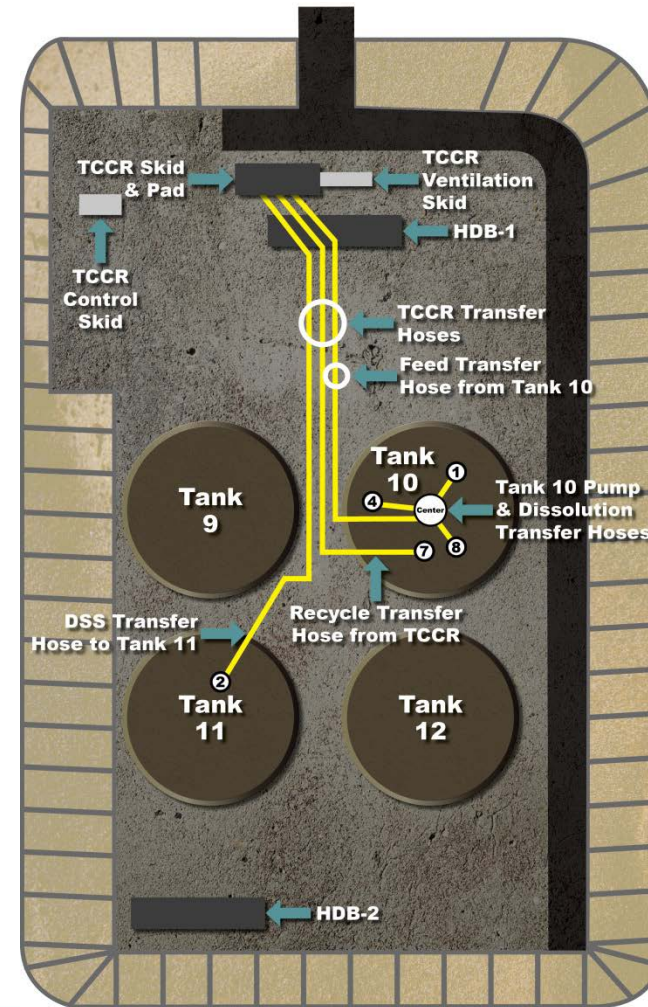
**Control Skid**



**Process Enclosure**



**Ventilation Skid**

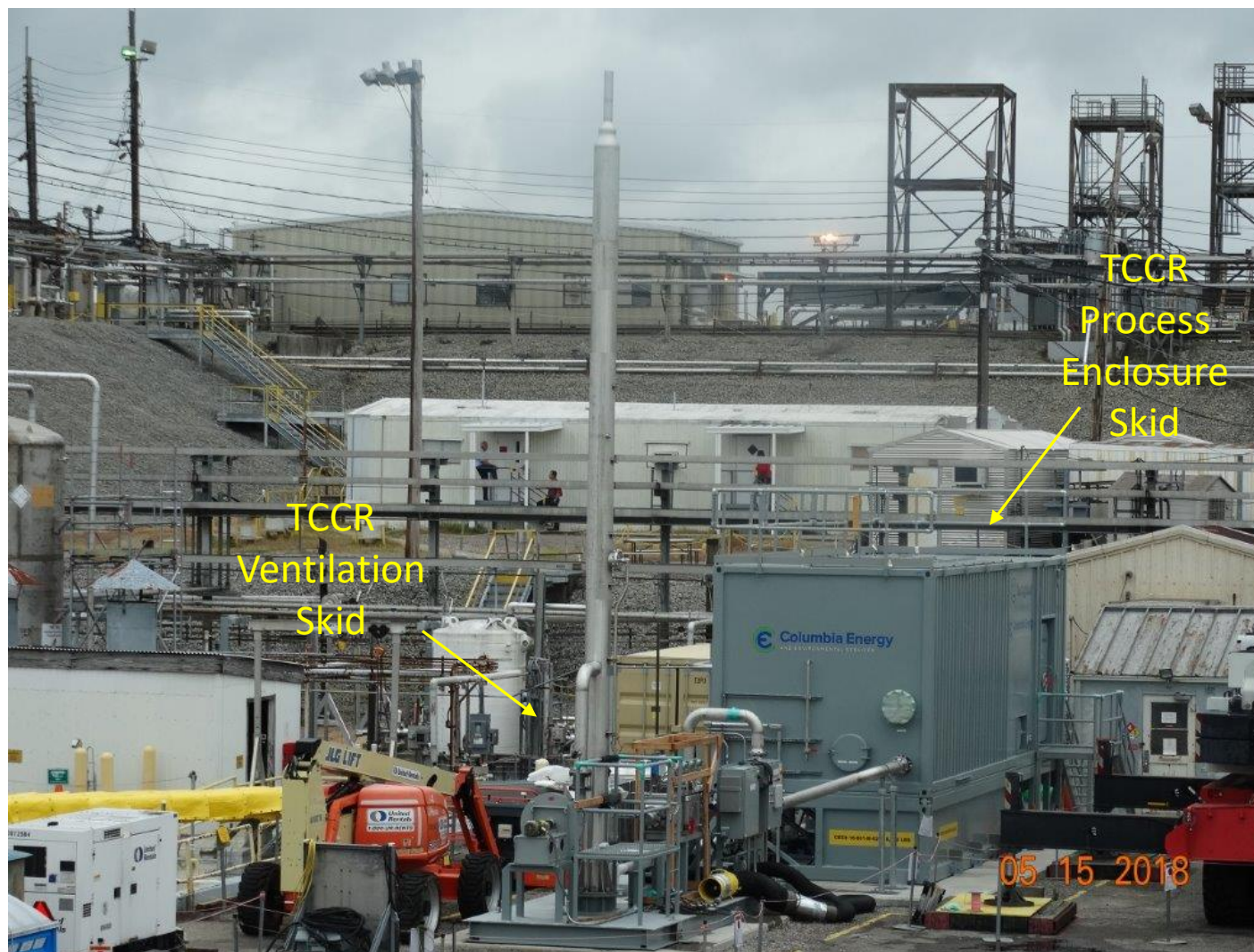






TCCR  
Process  
Control  
Skid

04 10 2018



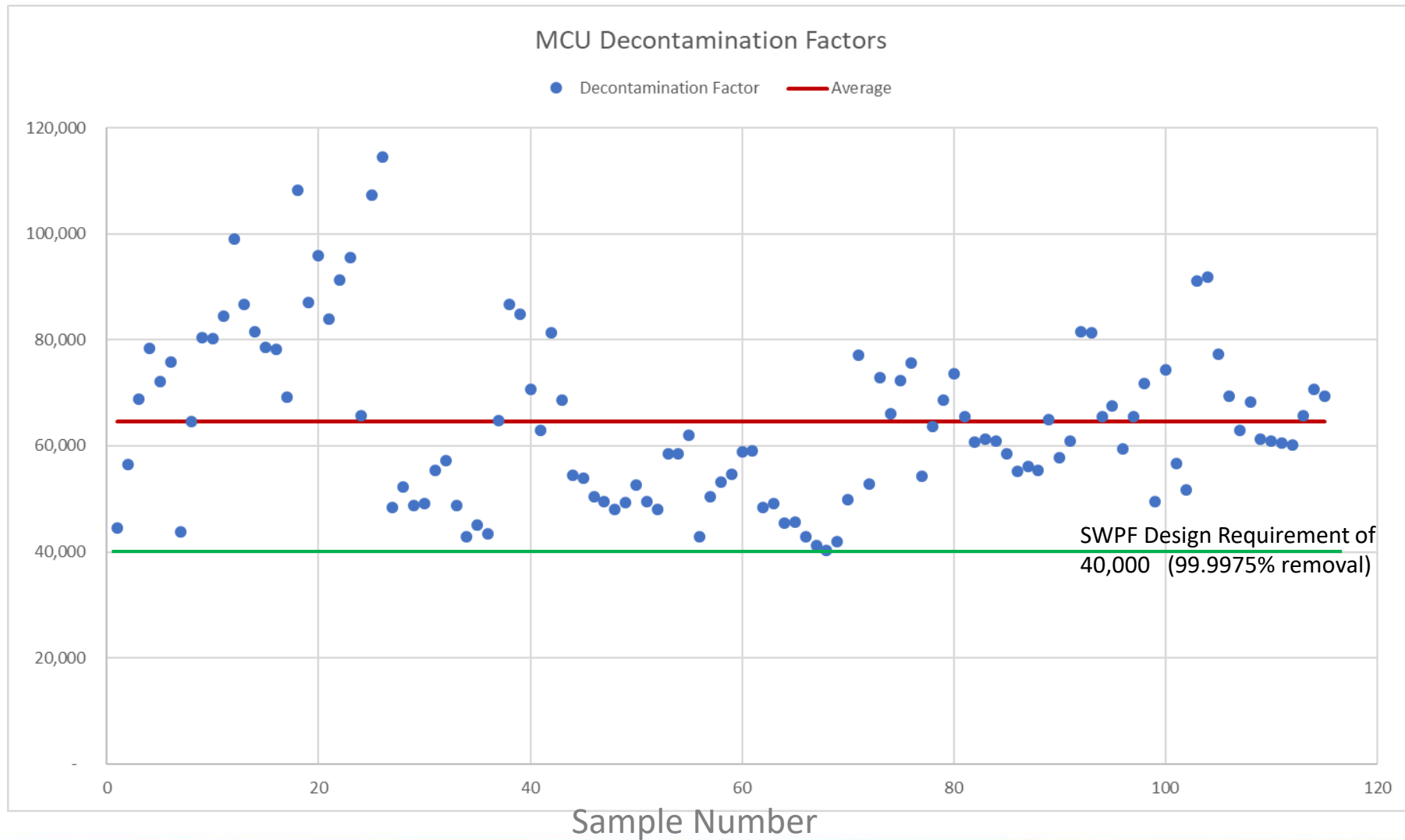


# Process Outline: ARP/MCU

- Provide Operational Experience for the Salt Processing Program:
  - Process Chemistry
  - Equipment Reliability
  - Operational/Maintenance Experience and Lessons Learned
  - Next Generation Solvent implemented into operations in FY14
- Process Salt Solution for Disposal:
  - If needed to meet Saltstone acceptance criteria, adsorb actinides/strontium onto MST
  - Clarify feed by filtration in the Actinide Removal Process (ARP)
  - Remove Cesium with the Modular Caustic Side Solvent Extraction Unit (MCU)
  - Send radionuclides to DWPF for inclusion into borosilicate glass
  - Send Decontaminated Salt Solution to Saltstone for low activity waste grout treatment



# Historical 2016 Average Decontamination Factor (Cs in/Cs out)for Cs 137 Prior to extended outage for DWPF Melter Replacement (Excludes Start-Ups)





# Salt Processing Performance

---

- Detailed process and equipment monitoring is performed during process operations for early detection and resolution of process or equipment problems. This information is used to develop reliability and process improvements for both planned and unplanned outages.
- During the DWPF melter replacement outage, extensive preventive maintenance, corrective maintenance and improvement modifications were performed at MCU to ensure continued reliable operations.
- ARP/MCU will be maintained to operate until the final tie-ins for SWPF operations.
- After suspension of operations for final SWPF tie-ins, ARP/MCU will be maintained in a state of readiness to return to service during the initial 6 months of SWPF operations.

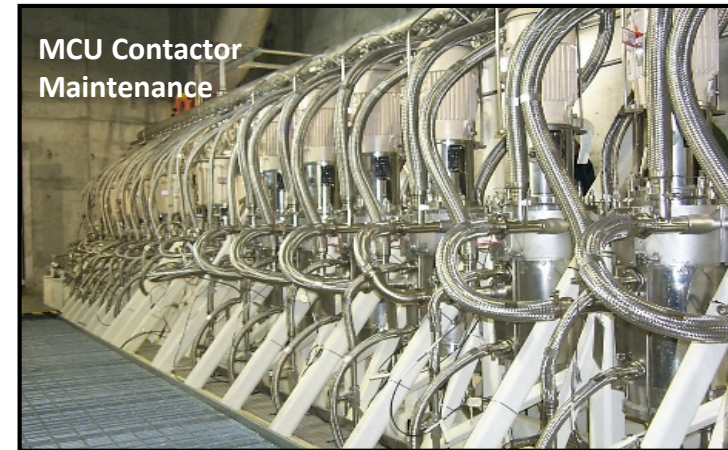
# Outage Activities

During the melter replacement outage three Extraction Contactors were pre-emptively replaced based on gathered vibration and performance data, to ensure long term reliability .

- The extraction contactors are the V-10, larger contactors.

- It is within the Extraction Contactor bank where the cesium laden waste is mixed with the solvent and cesium is extracted from the salt waste stream.

Additionally, during the outage, MCU ventilation modifications were implemented to increase the system availability and reduce worker radiological exposure.

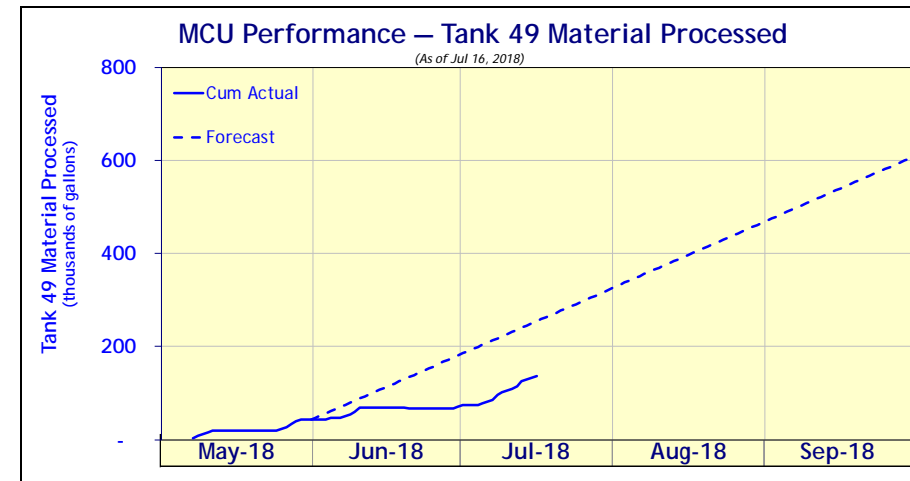


# 2018 Interim Salt Processing Performance

- ARP/MCU Operations were suspended 1/10/17 due to an unanticipated outage (end of life of the DWPF Melter):
  - Reliability and exposure improvements were completed during the unplanned outage period to ensure reliable operations upon restart.
- ~2M gallons of Qualified Salt Feed available for processing.
- On 5/22/18 ARP/MCU successfully resumed operations and has processed more than 137,000 gallons this year-to-date.
- FY18/19 has challenging production goal of 1.4 Mgal in a 10-month production period



**July 2018 — over 7 million gallons processed since startup in 2008**



# Summary

---

- The ARP/MCU process continues to provide successful salt processing since start-up in April 2008:
  - Supports space management in the tank farms, to enable continued DWPF vitrification operations
  - Helps bridge the gap until the Salt Waste Processing Facility starts up
  - Provides valuable process, equipment and operational experience for the Salt Processing Program
  - Helps reduce the lifecycle of the Salt Processing Program