C-105 Retrieval Update

Hanford Advisory Board Tank Waste Committee

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Above: Installation and operation of Extended Reach Sluicing System
Left: Composite photo of C-105 residual waste to be removed
C Farm History

- 1 of 4 original Hanford single-shell tank farms built to support the war effort.
- C Farm has 4, 55,000-gallon tanks and 12, 530,000-gallon tanks. C-105 is one of the larger tanks.
- Constructed and operated from 1943 to the 1980s. Used to store uranium recovery and PUREX process wastes.
- Pumpable liquid wastes were removed as part of the Interim Stabilization Project in the 1990s to reduce the environmental risk associated with aging SSTs.
- Retrieval of the sludge and “hard heel” waste in C Farm began 1998.
- So far 15 of the 16 tanks have been retrieved. C-105 will be the last tank.
C-105 Background

- First phase of retrieval using MARS-V
- Removed 92,000 gallons between June 2014 – September 2015
- Retrieval was slow due to more difficult waste conditions than expected; low waste recovery rates using MARS-V
- Retrieval terminated when a MARS-V end-effector hose ruptured. Cause determined to be end of equipment service life
- System engineering study completed. The decision was made to complete retrieval using sluicing technology with high pressure water and chemical dissolution (caustic)
- Construction of new retrieval system started December 2015; complete in July 2017
C-105 Retrieval Operational Plan

- 30,375 gallons waste remain
- Grab sample obtained and analyzed
- Laboratory testing and modeling indicates difficult-to-retrieve physical/chemical waste form
- Operations start in August 2017
  - Goal is to complete retrieval before winter
Process control plan

**Step 1** – Sluicing Cycle #1 with Supernatant (C-105 – AN-106)

**Step 2** – Hot Water Addition #1, Recirculate, and Transfer to AN-106

**Step 3** – Sluicing Cycle #2 with Supernatant (C-105 – AN-106)

**Step 4** – Caustic Dissolution #1, Recirculate, Add water and Transfer to AN-106

**Step 5** – Hot Water Addition #2 Recirculate, and Transfer to AN-106

**Step 6** - Sluicing Cycle #3 with Supernatant (C-105 – AN-106)

**Step 7** – Decant AN-106 to AP-102

**Step 8** – Caustic Dissolution #2, Recirculation and Transfer to AN-106

**Step 9** – Triple Rinse with Water; Fines Recovery to AN-106
Retrieval System Overview
C-105 Enhanced Leak Detection

- High Resolution Resistivity (HRR) system measures soil resistance changes to detect a potential leak
- C-105 ERSS Retrieval Enhancements
  - Additional data analysis of soil resistance changes
  - Additional leak potential values calculated
  - An additional analysis of a smaller group of electrodes reduces any dampening of leak potential values that might occur if calculations include resistance measurements made away from the suspect area
- Leak potential values reviewed daily
- Retrieval suspended pending further analysis if potential leak identified

Enhanced HRR
• Pre-retrieval communication with Hanford Advisory Board and other stakeholders
• Daily project progress/Industrial Hygiene readings summary
• Environmental Safety & Health updates on abnormal conditions
Questions?