

HANFORD TANKS

status update

Ecology's report on Hanford tank waste retrieval and closure - Fall 2016

Tank closure involves an array of activities such as waste retrievals, soil contamination investigations, performance assessments, and permitting. Visit Ecology's website ecy.wa.gov/programs/nwp for more information.

Progress of C-Farm SST Retrievals

Work is ongoing to move waste from Hanford's single-shell tanks (SSTs) in Waste Management Area C (C-Farm) to double-shell tanks (DSTs). C-Farm is the first of the tank farms slated for waste retrieval and closure.

Retrievals are completed for tank S-112 and all but one of 16 C-Farm tanks. The MARS-V retrieval system for C-105 has failed with 31,000 gal. remaining of the initial 122,000 gal. A new retrieval system using two Enhanced Reach Sluicing System (ERSS) arms is being installed in C-105.

To date, 91 percent of C-Farm waste has been removed (~2.1 million gal. of initial ~2.3 million gal.).

Residual waste volume of retrieved tanks ranges between 227 and 2070 cubic feet (1,698-15,485 gal.). Five tanks have residual volume greater than 400 cubic feet (2,992 gal.).

Once C-Farm retrieval is complete, work will start on retrieving waste from the four AX-Farm tanks (502,000 gal. total volume). Those will be followed by six of the A-Farm tanks (887,000 gal. total volume).

RCRA Facility Investigation (RFI) for C-Farm

Ecology has reviewed the RFI Report for C-Farm and provided comments to the US Department of Energy (USDOE). The RFI addresses only soils. The remedy for groundwater under C-Farm is being addressed in the Field Investigation Report for the 200-BP-5 Operable Unit.

Ecology's position is that the RFI Report for C-Farm needs a summary of groundwater impacts, including identification of any data gaps.

A revised (Final) RFI is due December 30, 2016. The USDOE will submit Corrective Measures Study for C-Farm together with the Final RFI.



Waste inside SST C-102 during retrieval operations in the summer of 2014. Operators work remotely using closed circuit TV monitors like the one seen above.

Corrective Measures Study (CMS) for C-Farm

The C-Farm CMS report is scheduled for submission to Ecology on December 30, 2016. It will evaluate options for corrective measures for vadose zone soils only, but will not evaluate waste remaining in the SST tanks and ancillary equipment.

Environmental impacts from post-retrieval waste volumes remaining in the SSTs, and post-remedial waste volumes remaining in the ancillary equipment, have been evaluated in the Performance Assessment (PA). The results will be incorporated into the Tier 2 Closure Plan for C-Farm. (See page two for explanation of Closure Plans.)

USDOE has determined, in "Clean Closure Practicability Demonstration for the Single-Shell Tanks," that SSTs will be landfill-closed. Ecology will make a landfill closure determination through the permit process, which includes public comment.

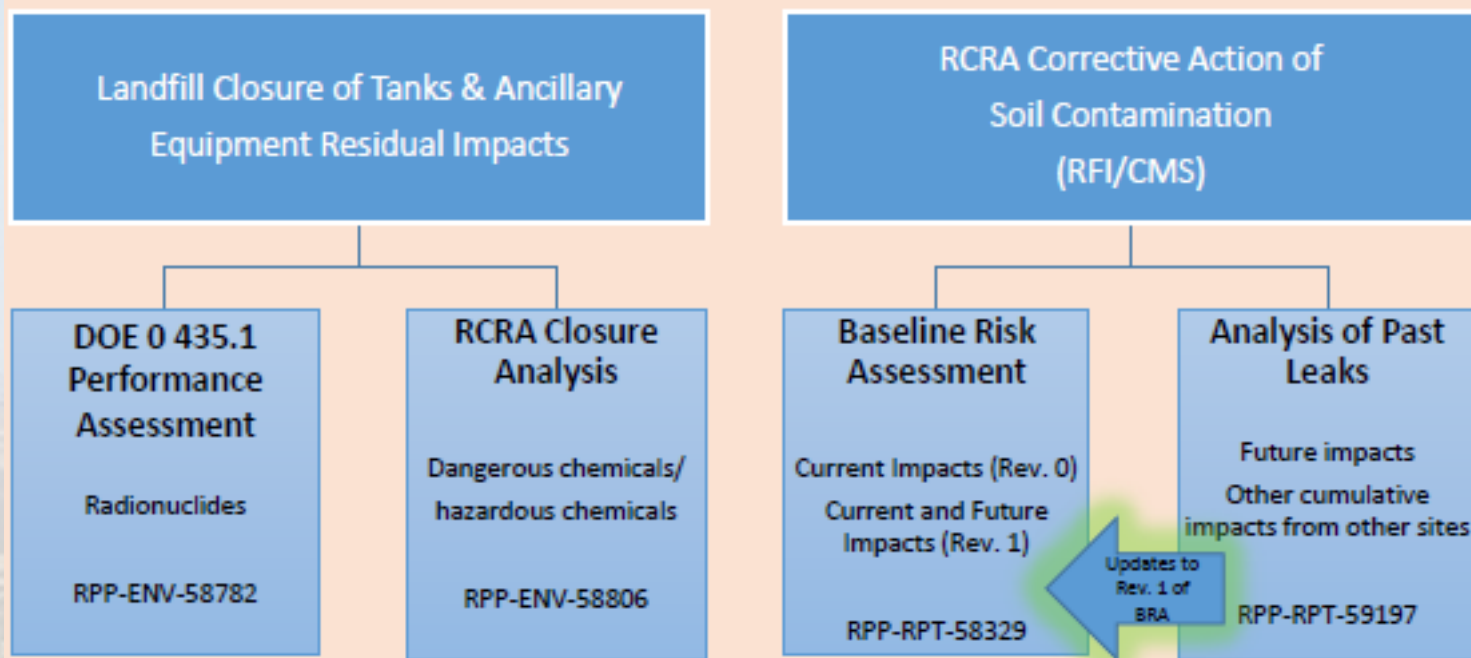
Performance Assessment (PA)

USDOE submitted the TPA Appendix I PA (IPA) to Ecology for review in October 2016. The IPA consists of four volumes. Figure “HFFACO Appendix I Performance Assessment (IPA),” below, provides a summary of the four IPA volumes and their functions within the IPA. Two of the volumes, DOE O 435.1 Performance Assessment for radionuclides, and RCRA Closure Analysis for chemicals and hazardous chemicals, evaluate tank and ancillary equipment residuals. The other two volumes evaluate impacts of contaminants present in vadose zone soils. These volumes are a Baseline Risk Assessment for current and future impacts assuming no action to mitigate existing contamination in vadose zone soils, and an Analysis of Past Leaks which includes future impacts from vadose zone contaminants and cumulative impacts from other sites.

USDOE expects to have the IPA available to the public in the first quarter of 2017.

Also in October 2016, the Waste Incidental to Reprocessing report was sent to USDOE Headquarters (Washington D.C.) for Nuclear Regulatory Commission review.

HFFACO Appendix I Performance Assessment (IPA)



SST Tier 1, 2, and 3 Closure Plans

Closure plans for the SSTs are defined in Tri-Party Agreement Appendix I and include Tier 1, 2, and 3 closure plans. These plans will be part of the Hanford Sitewide Permit. See Figure “Tier 1, 2, and 3 Closure Plans” on page 3.

Tier 1

Tier 1 is a “Framework Plan” that explains how USDOE intends to meet regulatory requirements pertaining to closure of all tank farms (WAC 173-303-610). Ecology is reviewing the Tier 1 Closure Plan for the SST System for completeness.

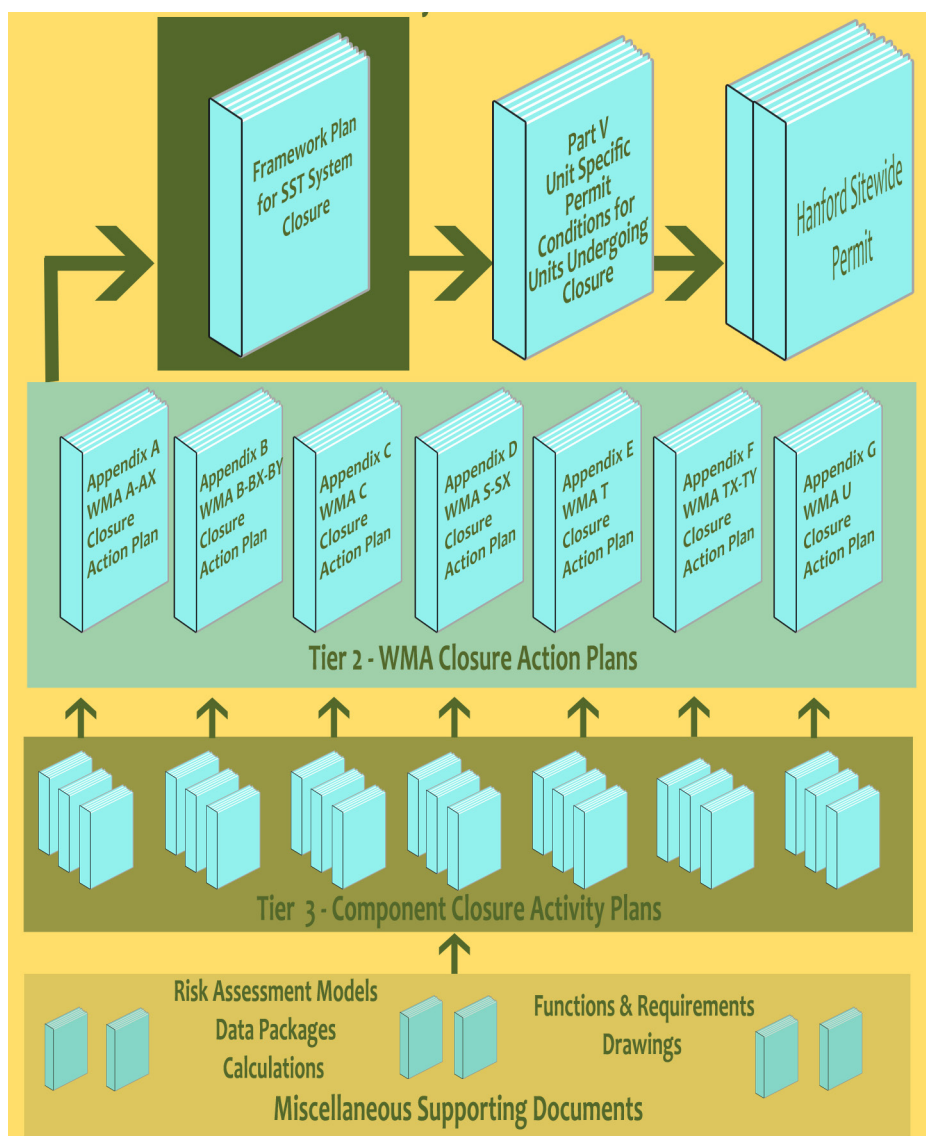
Tier 2

Tier 2 Closure Plans will be developed for each of the WMAs to document how closure requirements specific to each WMA will be met.

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Tier 1, 2, and 3 Closure Plans

Continued from page 2



Environmental impacts from any post-retrieval waste volumes remaining in the SSTs and any post-remedial waste volumes remaining in the ancillary equipment at WMA C are evaluated in the PA, and the results will be incorporated into the Tier 2 Closure Plan for C-Farm.

USDOE plans to issue the Tier 2 Closure Plan for C-Farm in the Spring of 2017. However, the schedule for Tier 2 and Tier 3 closure plans is currently in dispute.

Tier 3

Tier 3 Closure Plans, or “Component Closure Activity Plans,” will be developed for ancillary equipment or other components at each WMA.

242-A Evaporator

The 242-A Evaporator is integral to increasing space in Hanford DSTs by decreasing liquid volumes.

The most recent evaporator campaign (EC) EC-05 was completed in April 2016. It resulted in a net waste volume reduction of 0.046 million gallons (after equipment and line flushes and water additions). About 2.4 million gallons of DST space has been recovered altogether since the restart in 2014.

The campaigns completed since the restart are summarized in the table “Evaporator Campaigns”. Another campaign is expected to begin in March 2017.

An integrity assessment of 242-A Evaporator by an independent qualified registered professional engineer is planned during Fiscal Year (FY) 2017.

Evaporator Campaigns

Evaporator Runs (Campaign)	Net Waste Volume Reduction (millions of gallons)
September 2014 - 13-01	0.791
May 2015 - EC-01	0.381
July 2015 - EC-02	0.384
September 2015 - EC-03	0.375
April 2016 – EC-04	0.258
April 2016 – EC-05	0.046
TOTAL	2.235 (~2.4)
EC-06 (scheduled for March 2017)	Estimated 0.221

Double-Shell Tanks (DSTs)

There are 28 DSTs at the Hanford Site. The following DST integrity assessment activities were completed in FY 2016:

- Enhanced annulus video inspections were completed for tanks AN-101, AN-103, AN-104, AN-105, AN-106, AW-103, AW-106, SY-101, SY-102, and SY-103.
- Ultrasonic testing of the primary tank wall and secondary containment floor were completed for tanks AN-105 and AW-103.
- The 2016 DST Integrity Assessment Report was issued.

Work Planned in FY 2017 includes:

- Additional enhanced video inspections are planned for tanks AZ-101, AZ-102, AW-105, AN-102, AN-107, AP-101, AP-107, and AY-101.
- Ultrasonic testing is planned for tanks AY-101, AN-106, and AZ-101.
- Modifications are planned to the DSTs for Direct Feed Low Activity Waste vitrification. Tank waste will be treated first in the Low Activity Waste Pretreatment System (LAWPS) to remove solids and radioactive cesium, and then sent to the Low Activity Waste facility (LAW) for vitrification. New transfer lines are being installed between the DSTs and LAWPS, and between LAWPS and LAW.



Hanford's Waste Treatment Plant (WTP) complex in October of 2016. A March court order set hard deadlines for the completion and operation of the three main components of the WTP:

- A plant designed to treat low-activity waste, must begin treatment by 2022.
- A Pretreatment Facility to separate Hanford's tank waste into low-activity and high-level waste streams is required to start operations by December 31, 2031.
- The High-level Waste Facility must begin treatment by June 30, 2032.

AY-102 Recovery Project

Tank AY-102 was the first of the 28 DSTs constructed at the Hanford Site. In 2012, waste was observed to have leaked from the primary (inner) tank to the secondary (outer) tank space – also known as the annulus.

Under the terms of the AY-102 Settlement Agreement, waste is to be removed from AY-102 by March 2017. The AY-102 Recovery Project was established to retrieve waste from AY-102 and transfer it to sound DSTs.

Pumping of waste from AY-102 started on March 3, 2016, by pumping liquid supernatant to AW-105, followed by sludge retrieval to AP-102. Altogether, 95 percent of the waste volume has been removed from AY-102 to date.

Work is underway to remove the remaining waste from AY-102. Four extended reach sluicers have been installed and tested. Activities to support future retrieval activities are ongoing.

The overall project is on schedule to complete waste retrieval by March 2017, in accordance with the terms of the Settlement Agreement.

***To date, 95% of waste
has been
removed from
DST AY-102.***



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