

# Nuclear Waste Program

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## Single-Shell Tank Closure Ecology Perspective

Jim Alzheimer

Washington State Department of Ecology

Single-Shell Tank Engineer

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# Single-Shell Tank System Closure Pieces

- Tank Waste Retrieval
- Closure of each SST under a component closure plan (i.e., Tier 3)
- Closure of all other waste management area (WMA) components
- Mitigation of vadose zone contamination
- Coordination with mitigation of groundwater contamination
- Coordination with other interfacing and WMA closure sites

## Risk Based Retrieval of Single-Shell Tanks

- The current “end of retrieval” criteria are not risk based.
  - The 360 cubic foot or less requirement for 100 Series SSTs, use of three technologies requirement, and the limit of technologies requirement were established for C-Farm because it was not possible to establish risk based criteria at that time.
- The most current analysis results for C-Farm indicate the risk to the groundwater for future releases from the grouted tanks will be less than the risk of contamination already in the vadose zone.
  - These analysis results used best knowledge of tank residual volumes and composition for retrieved tanks and predictions for the few remaining tanks.

# Risk Based Retrieval of Single-Shell Tanks

- Appendix H – “Single Shell Tank Waste Retrieval Criteria Procedure” provides steps to be taken to revise the “end of retrieval” criteria.

## Risk Based Retrieval of Single-Shell Tanks

- The purpose of Appendix I – “Single-Shell Tank System Waste Retrieval and Closure Process” is to “Document the process DOE is required to use to close DOE’s SST system (i.e., the SSTs themselves; and associated ancillary equipment including waste transfer piping, valve pits, vaults, etc.; contaminated soils, and contaminated groundwater) including the retrieval of tank wastes.”
- If the Appendix I Performance Assessment is evaluated prior to retrieval, risk based tank retrieval criteria could be established with closure of other components, and remediation of past releases to the environment, including groundwater contamination.

## Meets Performance Standards

- Closure of any one Single-Shell Tank is part of the closure process for the entire Single-Shell Tank System
- The Single-Shell Tank System includes all SSTs, ancillary equipment such as pipelines and catch tanks, and the contamination in the vadose zone and groundwater
- The closure requirements for any one system component, including each SST, must be established to assure the Performance Standards for the entire SST System and each SST WMA are met. This is part of the Appendix I Performance Assessment process

# Closure Performance Standards



- WAC 173-303-610(2) Closure performance standard. The owner or operator must close the facility in a manner that:
  - (a)(i) Minimizes the need for further maintenance;
  - (ii) Controls, minimizes or eliminates to the extent necessary to protect human health and the environment, post-closure escape of dangerous waste, dangerous constituents, leachate, contaminated runoff, or dangerous waste decomposition products to the ground, surface water, groundwater, or the atmosphere; and
  - (iii) Returns the land to the appearance and use of surrounding land areas to the degree possible given the nature of the previous dangerous waste activity.

# Retrieval Technologies



- While the current retrieval technologies have not always reached the 360 cubic foot end of retrieval criteria, they appear to be capable of removing enough waste to provide adequate protection of human health and the environment **for the tanks retrieved to date.**

## Retrieval Technologies

- There are other tanks to be retrieved that, due to tank conditions and waste properties, may not be adequately retrieved with current technologies
  - A-105 has a bulged bottom and liner tear with extremely hot waste of poorly characterized volume and composition below the liner
  - Air Lift Circulators in AX-Tanks will complicate the retrieval interface for the operators {but we are getting some experience in AY-102}
  - The waste retrieved from C-Farm is not necessarily representative of all other SSTs

## Retrieval Concerns

- Current Retrieval rates are much less than projected to be needed to meet TPA milestones in the future
- Once the 10 A/AX tanks are retrieved, the DST system will not have any capacity to accept waste for any more tanks even with optimal use of the evaporator

## Final Comments

- ORP and WRPS continue to make progress on SST retrievals
- Lessons learned are being applied to the A/AX retrieval system and should provide more reliability
- Retrieval of waste from SSTs is an important part of closure but there are many other important steps remaining
- Ecology is interested in perspective from the Hanford Advisory Board and the Public including tank retrievals and tank farm closure

## Contact Ecology:

Phone: 509-372-7950

Web: [ecy.wa.gov/programs/nwp](http://ecy.wa.gov/programs/nwp)

Email: [Hanford@ecy.wa.gov](mailto:Hanford@ecy.wa.gov)

