



OFFICE OF
RIVER PROTECTION
United States Department of Energy

System Plan 8

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Presented by: **WTP Startup, Commissioning & Integration**

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The Tank Farms A 200 Area Aerial Overview

200 West Area

200 East Area

Effluent Treatment
Facility Ponds

Waste Treatment and
Immobilization Plant

- Single-Shell Tank Farm
- Double-Shell Tank Farm





- DOE issued the first System Plan on its own initiative in August 2002
 - Five revisions were issued between 2003-2010
- Issuance of system plans every three years became a regulatory requirement when TPA Milestone M-062-40 was created during the Consent Decree and TPA modification negotiations that became effective on October 25, 2010.
- System Plans 6-8 under the TPA were completed in 2011, 2014 & 2017.





- A System Plan is a document used to describe a group of possible technical solutions to complete the Office of River Protection's mission.
- The System Plan projects a baseline case that uses the known assumptions and plans to project what is expected to happen.
- System Plan also looks at other “what-if” scenarios to assist in future planning and decision-making.
- System Plan 8 is a planning document – not a decision or budget document.



Per the TPA milestone, each system plan must address:

- Certain overall requirements
- Tank waste treatment
- Supplemental treatment
- Tank waste retrieval
- Contingency planning

System Plans are developed every three years based upon scenarios developed by Ecology and DOE one year in advance.

- System Plan 8 is based on computer modeling that provides rough cost-and-schedule estimates for a set of technical scenarios for completing the River Protection Project mission.
- The scenarios analyzed in System Plan 8 include a baseline case and 10 other scenarios jointly selected by DOE and Ecology in 2016.
- A joint working group from ORP, Ecology and WRPS coordinated the Plan's scenarios, assumptions and modeling approach.
- The modeling results project a cost increase of approximately \$62 billion (unescalated) and a schedule increase of approximately 19 years.
- DOE believes further analysis is needed that focuses on how the assumptions and conditions interact with one another to impact the costs and the hypothetical completion dates of the RPP mission.

- **Revised or new assumptions**
 - Incorporation of DFLAW
 - Start dates align with milestones in Amended Consent Decree
 - Retrievals based on updated data from C-Farm performance
 - No constraints placed on completion dates

- **Assumptions consistent with prior plans**
 - Does not account for delays associated with tank vapors
 - Reflects an approach that does not factor in anticipated budgetary constraints
 - WTP operates at 70 percent availability
 - HLW mission is the critical path
 - Assumed supplemental treatment adequate to keep HLW as critical path, i.e., black box.

- **Scenario 1 – Baseline Case**
 - Objective – Evaluate the mission as currently planned, including DFLAW
- **Scenario 2 – Early Direct-Feed High-Level Waste**
 - Objective – Evaluate the impacts of including early Direct-Feed High-Level Waste (DFHLW) prior to startup of the WTP Pretreatment (PT) Facility
- **Scenario 3 – Early Direct-Feed High-Level Waste with no WTP PT Facility**
 - Objective – Evaluate the impacts of eliminating the WTP PT facility and Low-Activity Waste supplemental treatment
- **Scenario 4 – Risk-informed single-shell tank retrievals**
 - Objective – Evaluate the impacts of retrieving 98% of remaining single-shell tank waste radioactivity (Ci) without retrieving all of the SSTs
- **Scenario 5 – Accelerated tank retrieval completion**
 - Objective – Determine the number of new double-shell tanks and when they would be needed to complete all SST retrievals by June 2047
- **Scenario 6 – TPA compliant**
 - Objective – Calculate the required retrieval/treatment capacities that would be needed to meet current TPA milestones for retrieving all SST waste (12/31/2040) and treating all tank waste (12/31/2047)



- **Scenario 7 – Reduced waste throughput**
 - Objective – Evaluate the impacts of lower-than-anticipated waste retrieval and treatment rates
- **Scenario 8 – Early U Farm retrievals**
 - Objective – Evaluate retrieving U-Farm SSTs after A/AX farms (instead of S/SX farms)
- **Scenario 9 – Offsite effluent treatment**
 - Objective – Evaluate the opportunity to treat and dispose LAW vitrification and LAW supplemental treatment effluents offsite
- **Scenario 10 – Tank retrieval contingency**
 - Objective – Determine the number of new DSTs and when they would be needed to maintain the baseline case retrieval completion date (12/2056) assuming a 5-year delay to DFLAW and WTP
- **Scenario 11 – Direct-Feed High-Level Waste with liquids-only WTP Pretreatment Facility**
 - Objective – Evaluate the impacts of DFHLW with liquids-only WTP PT facility





- Mission duration is primarily driven by WTP Pretreatment and High-Level Waste vitrification throughput
- Escalated lifecycle cost is primarily driven by treatment mission duration
- All scenarios exceed an escalated annual cost of \$2B by 2030



Scenario	Complete all SST Retrievals	Complete Treatment	Forecast Unescalated Lifecycle Cost
1 - Baseline Case	12/2056	11/2063	\$111B
2 - Early DFHLW	8/2053	8/2058	\$104B
3 - Early HLW without PT	12/2064	11/2126	\$151B
4 - Risk Informed Retrievals	10/2050	7/2061	\$103B
5 - Early Retrieval Completion	9/2046	3/2064	\$117B
6 - TPA Compliant	12/2040	12/2047	n/a
7 - Reduced Throughput	3/2074	3/2081	\$148B
8 - Early U Farm Retrieval	6/2055	5/2064	\$112B
9 - Offsite Effluent	12/2055	5/2063	\$110B
10 - Retrieval Contingency	11/2055	12/2068	\$116B
11 - DFHLW w/ Liquids only PT	8/2062	9/2079	\$136B

- Information included in System Plan 8 will help aid discussions with Ecology and other stakeholders regarding improved approaches for conducting ORP's mission.
- DOE is planning to examine the modeling approach used to prepare System Plan 8, as well as the underlying algorithms and assumptions used. Ecology and EPA will be invited to participate in this effort.
- DOE is working to identify opportunities in the near-term that could significantly reduce cost and schedule.
- DOE is committed to maintaining a sense of urgency in Hanford cleanup while making safe and efficient progress and serving as a good steward of taxpayer resources.



Questions?

The Hanford Reach
White Bluffs Overlooking the Columbia River

