THE HANFORD SITE

System Plan 9

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November 18, 2020

Introduction

- Objective of the briefing
  - Provide an introduction to System Plan 9
- What is being briefed?
  - High-level briefing of System Plan 9
  - Location of System Plan 9 document
- What do we want the Hanford Advisory Board to do with this information?
  - Data is relevant in continued policy-level discussions regarding potential alternatives to safely increase efficiency in tank waste treatment

System Plan 9

- System Plan 9 evaluates the current baseline approach for executing Hanford's tank waste retrieval, treatment and disposition mission, as well as four alternative scenarios.
- Tri-Party Agreement milestone M-062-40 requires DOE to submit a system plan to Ecology by Oct. 31 every three years. DOE requested, and was granted, a two-week extension on submitting the system plan to Ecology and System Plan 9 was sent to Ecology on Nov. 13.
- System Plan 9 is available on the Hanford Administrative Records website (https://pdw.hanford.gov/) using the search term "AR-04287."

Scenarios in This Revision - #1

Scenario 1, Baseline Case

- Forecast the River Protection Project mission using current baseline plans and assumptions and (1) derive estimated retrieval and treatment completion dates using input dates from the Amended Consent Decree (2016), and (2) assess the ability to comply with the Amended Consent Decree and the Tri-Party Agreement.
- Scenario 1B is a sensitivity case built on Scenario 1, in which U Farm single-shell tank (SST) retrievals occurred before S/SX Farm, and the treatment facility total operating efficiency was reduced from 70% to 50%. It provides a baseline scenario that uses the same throughput assumption as the alternative scenarios, making it useful for comparisons.

Scenarios in This Revision - #2

Scenario 2, Treatment-Favored Direct-Feed Low-Activity Waste/Direct-Feed High-Level Waste with Early Characterization in Double-Shell Tanks

- Modifies Scenario 1 by using the double-shell tanks (DSTs) for high-level waste (HLW) feed characterization, coupled with a new HLW feed preparation facility (HFPF) for preparing the waste for direct feed into the HLW vitrification (immobilization in glass) facility. This scenario also includes the addition of two new evaporators coupled with full-mission direct-feed low-activity waste (DFLAW) for low-activity waste treatment, and prioritizes treating waste over retrieving SSTs.

Scenarios in This Revision - #3 & #4

Scenario 3, Treatment-Favored DFLAW / Direct-Feed HLW with Independent HLW Sampling and Pre-Treatment Facility

- Modifies Scenario 2 by performing HLW feed preparation in a larger HFPF, rather than in the DSTs.

Scenario 4, Retrieval-Favored DFLAW / Direct-Feed HLW with Early Characterization in DSTs and Add New DSTs

- Modifies Scenario 2 by prioritizing SST retrievals over waste treatment and constructing new DSTs as needed to maintain the SST retrieval completion schedule as per Scenario 1, to determine what would be required to execute a direct-feed HLW scenario without affecting SST retrievals.

Scenarios in This Revision - #5

Scenario 5, Periodic DST Failures

- Evaluate the effects and challenges of five DSTs leaking and being removed from service. In this scenario, one DST will be declared leaking every five years (starting in 2025). Following the leak declaration, the DST is retrieved and removed from service for the remainder of the mission.
- This scenario also demonstrates it is possible, from a tank space management perspective, to retrieve leaking DSTs at various points in the mission in approximately 1 year or less while still maintaining the required emergency pumping space.

Results of Scenario 1

- This scenario shows retrieval of waste from all SSTs will be completed by 2061 and all tank waste treatment will be completed by 2066 at a life-cycle cost of $107 billion (unescalated) / $192 billion (escalated).
- When compared with results of the System Plan 8 baseline scenario, this scenario predicts a slightly longer life-cycle schedule (by three years) and slightly reduced life-cycle cost ($3 billion [unescalated] less).

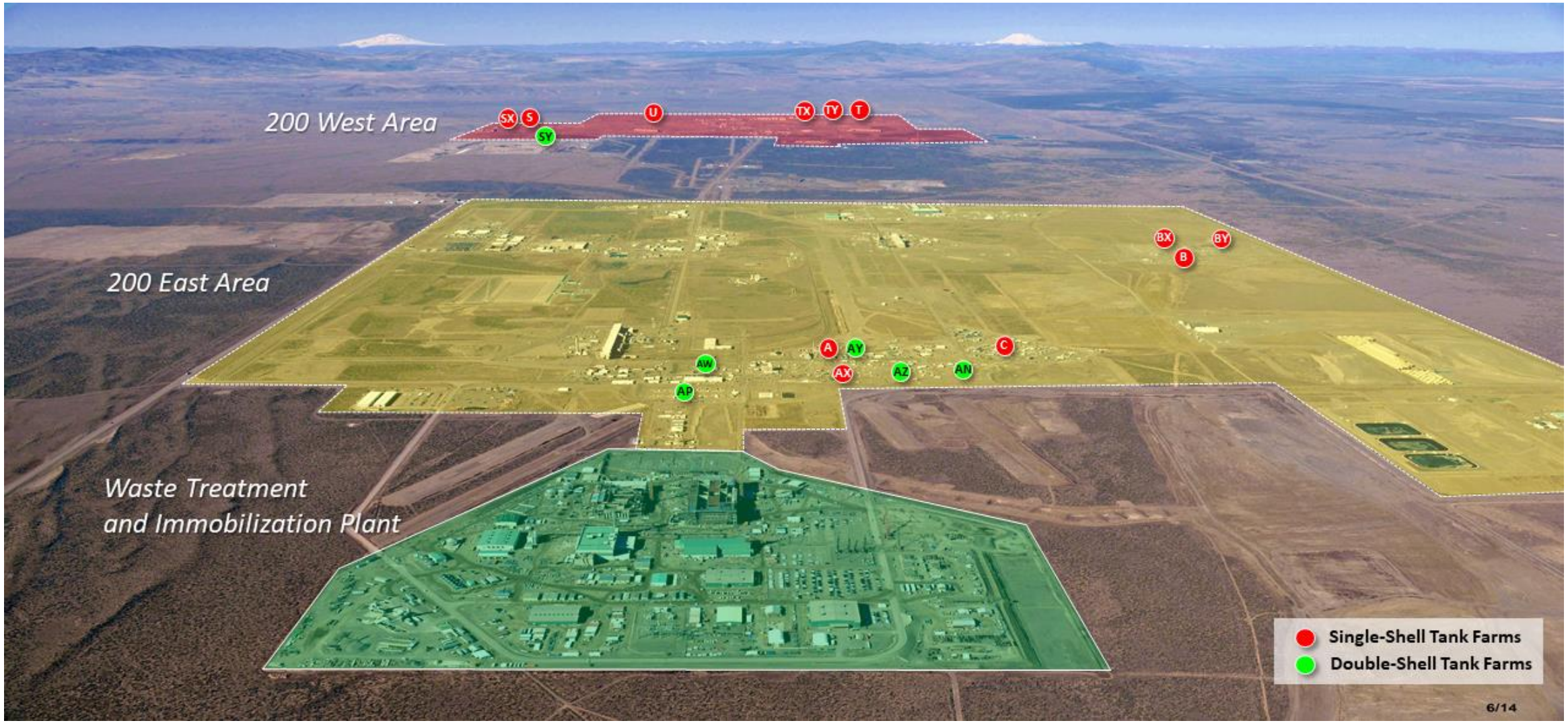
Results of Scenarios 2-5

- None of these scenarios showed a substantial improvement on the cost and schedule projections of Scenario 1.
- System Plan 9 does not restrict costs to current budget levels; substantial budget increases will be required to achieve the schedules forecasted in any of the scenarios, including Scenario 1.
- There is no cost and schedule benefit to building new DSTs.
- There are options besides completing construction of the pretreatment facility at the Waste Treatment and Immobilization Plant that can be effective in pretreating waste for the HLW facility with little schedule effect.
- In addition to vitrification, treating low-activity waste using grout is a technically-viable option that modeling shows is cost-effective and compatible with the baseline schedule.

Summary

- System Plan 9 is not a decision document; it provide tools that can be helpful in identifying mission needs, bottlenecks, risks, and opportunities.
- The results of the scenarios are generally considered to be optimistic, because they do not account for potential future risks or upsets (e.g., natural disasters, funding shortfalls)
- Key System Plan 9 takeaways:
  - Building new tanks does not offer mission benefits
  - Tank waste treatment is the best approach to tank space management
  - Supplemental treatment other than vitrification offers substantial cost and schedule benefits

Questions?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