OFFICE OF
RIVER PROTECTION
United States Department of Energy

Hanford Advisory Board

U.S. Department of Energy, Office of River Protection
Agency Update

Presented by: Jonathan (JD) Dowell, Deputy Manager

February 5, 2015

Fiscal Year 2014 and 2015 Budget Overview

Project Baseline Summary	Project Baseline Summary Title	Fiscal Year (FY) 2014 Omnibus Budget ($ in 000s)	FY 2015 President's Budget ($ in 000s)	FY 2015 Omnibus Budget ($ in 000s)	FY 2016 President's Budget ($ in 000s)
ORP-0014	Radioactive Liquid Tank Waste Stabilization and Disposition	$520,216	$522,000	$522,000	$649,000
ORP-0014	15-D-409, Low-Activity Waste Pretreatment System	$0	$23,000	$23,000	$75,000
Subtotal	**Radioactive Liquid Tank Waste Stabilization and Disposition**	**$520,216**	**$545,000**	**$545,000**	**$724,000**
ORP-0060	Waste Treatment and Immobilization Plant (WTP) – Subprojects A-D	$510,000	$575,000	$563,000	$595,000
ORP-0060	WTP – Subproject E	$180,000	$115,000	$104,000	$95,000
Subtotal	**Major Construction – WTP**	**$690,000**	**$690,000**	**$667,000**	**$690,000**
Total – ORP	**Office of River Protection (ORP) Funding Summary**	**$1,210,216**	**$1,235,000**	**$1,212,000**	**$1,414,000**

The Tank Farms
A 200 Area Aerial Overview
200 West Area
200 East Area
SX
S
U
TX
TY
T
SY
BX
BY
B
C
AW
A
AY
AX
AZ
AN
AP
Waste Treatment and Immobilization Plant
Single-Shell Tank Farm
Double-Shell Tank Farm

Single-Shell Tank Waste Retrieval in C Farm

RETRIEVAL TECHNOLOGIES

Mobile Arm Retrieval System Sluicing (MARS-S)

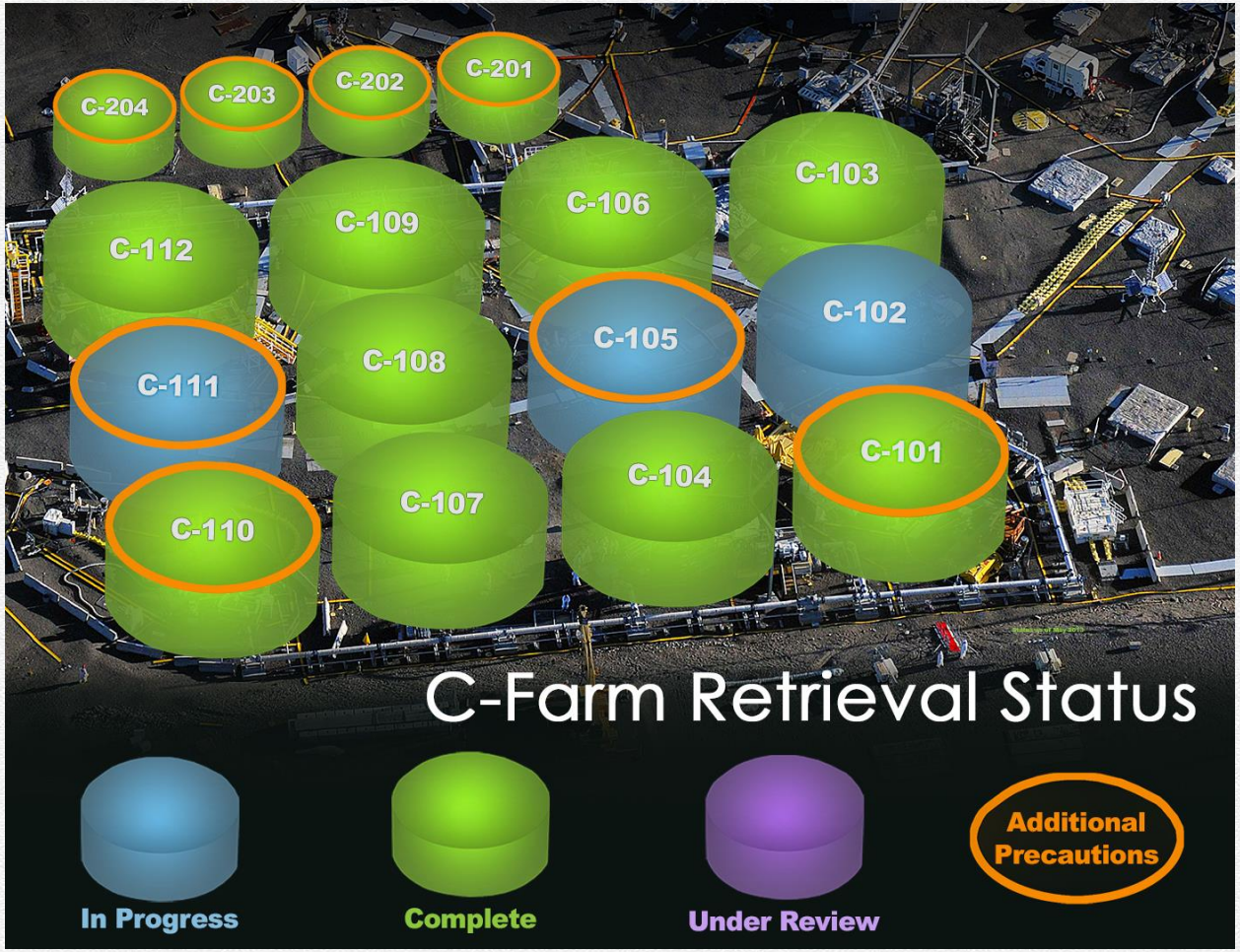
Chemical Dissolution

Enhanced Reach Sluicing System (ERSS)

Modified Sluicing

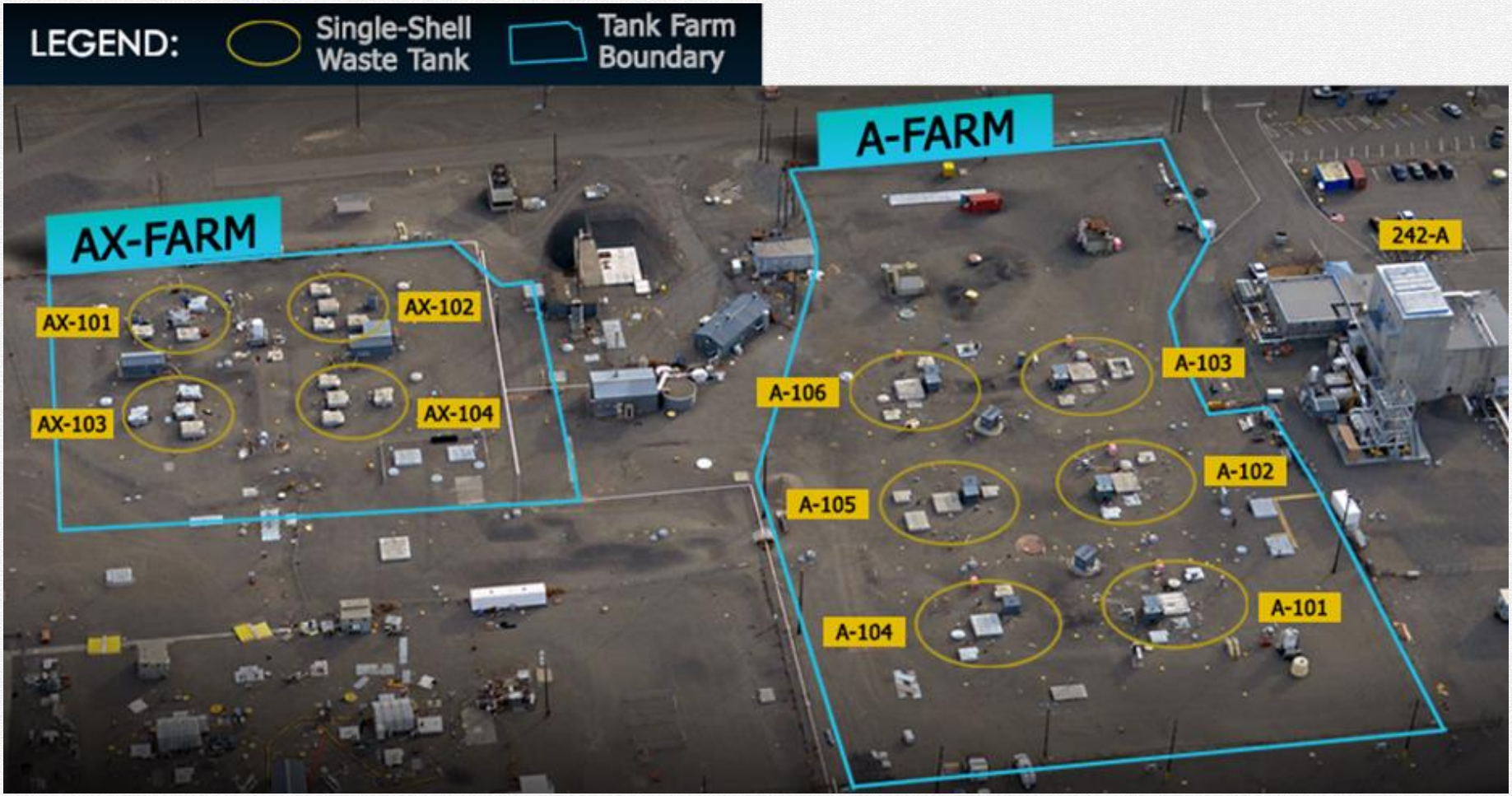
In-Tank Vehicle (Foldtrack)

Mobile Arm Retrieval System Vacuum (MARS-V)

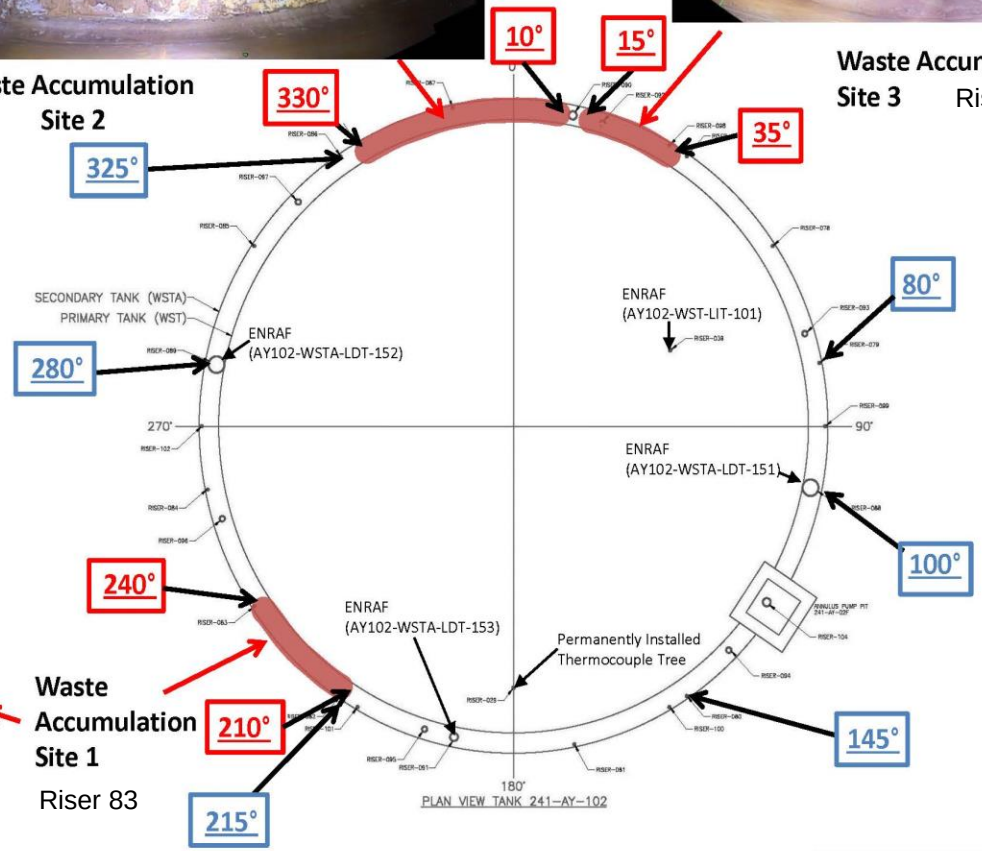


Aerial photograph of C Farm with graphical overlay that depicts current status of each single-shell tank (SST).

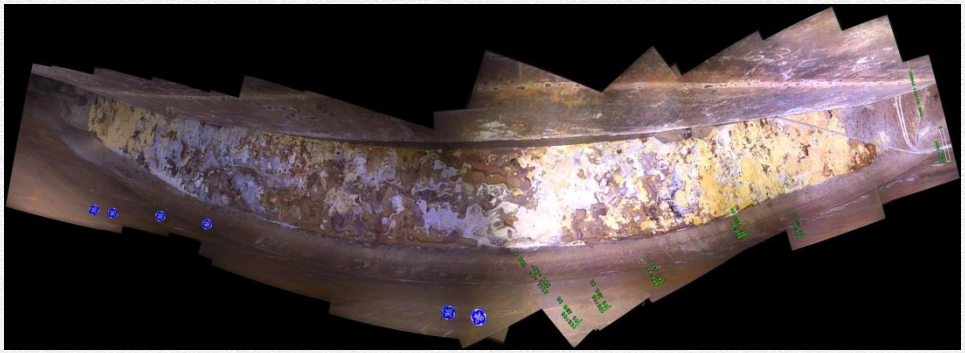
Next Single-Shell Tank Farms for Retrieval



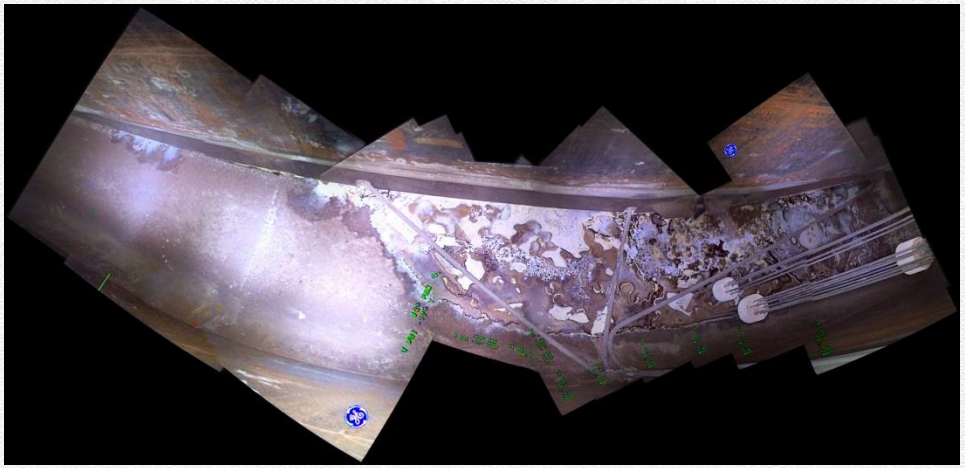
Double-Shell Tank AY-102 Waste Accumulation Sites



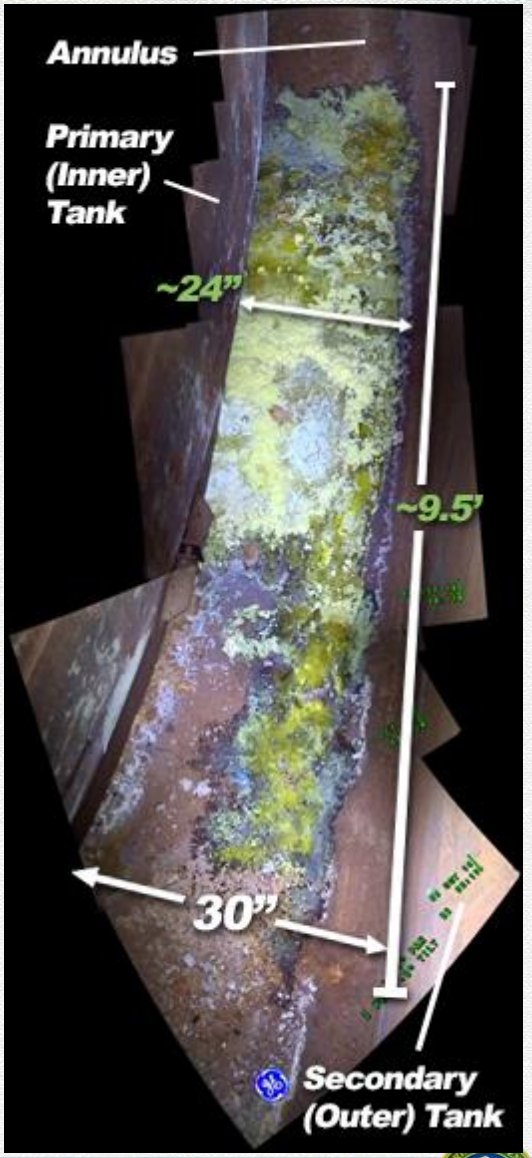
Status on Double-Shell Tank AY-102



Riser 87



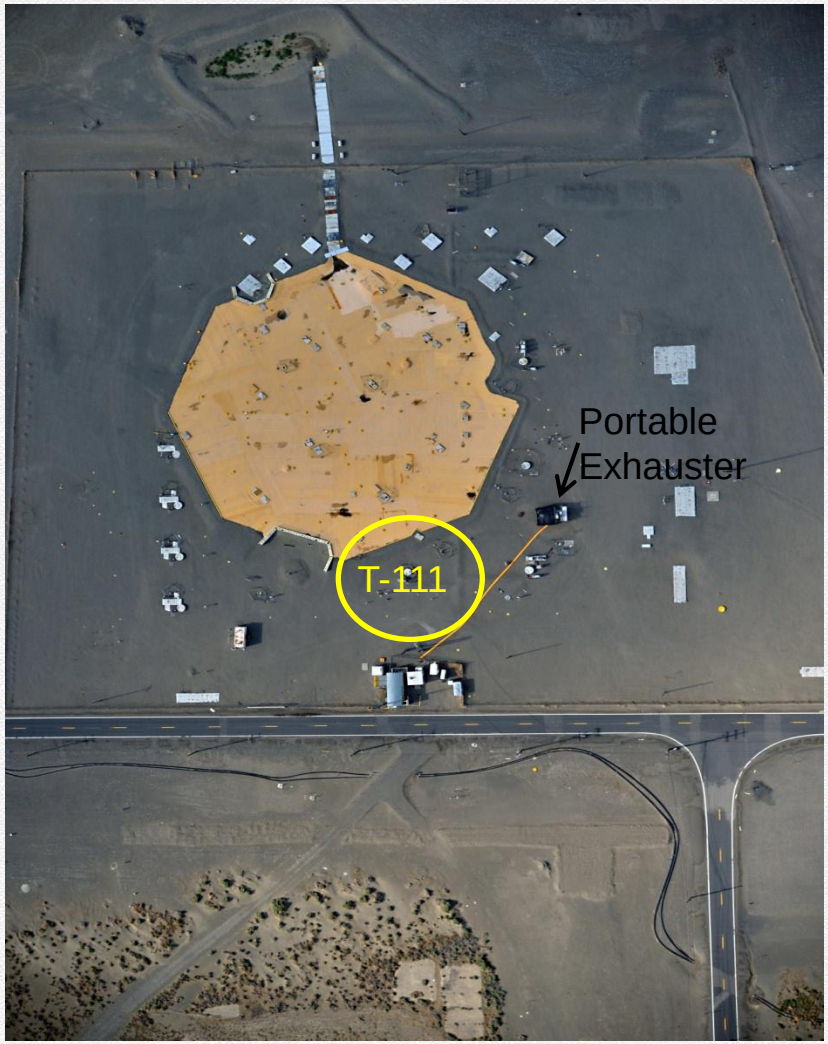
Riser 77



Riser 83

Double-Shell Tank AY-102 Equipment Update

Single-Shell Tank T-111



Independent Expert Assessment

- Savannah River National Laboratory led an expert panel review of current chemical vapors management and worker protection measures
- Experts from academia, industry, professional societies, and government agencies
- Experienced in toxicology, exposure assessment, industrial hygiene engineering, program management, and chemistry and respiratory protection
- Not just a review; focused on solutions
- Report released in December 2014
- Tank Vapor Implementation Plan (in progress)

Current Actions to Control Potential Exposures to Chemical Vapors

- **Enhancing respiratory protection requirements**
- **Hiring additional industrial hygiene staff**
- **Developing functions and requirements for new field monitoring and alarming equipment**
  - Vapor technology vendor day
- **Evaluating and procuring new personal monitoring and alarming instruments**
- **Sampling and characterizing tank head space gases**
- **Developing new training programs**
- **Enhancing communications**
- **Updating medical protocols**

Waste Treatment and Immobilization Plant

Low-Activity Waste Facility

Continuing work in the low-activity waste melters – refractory brick and trough and dam installation

Analytical Laboratory

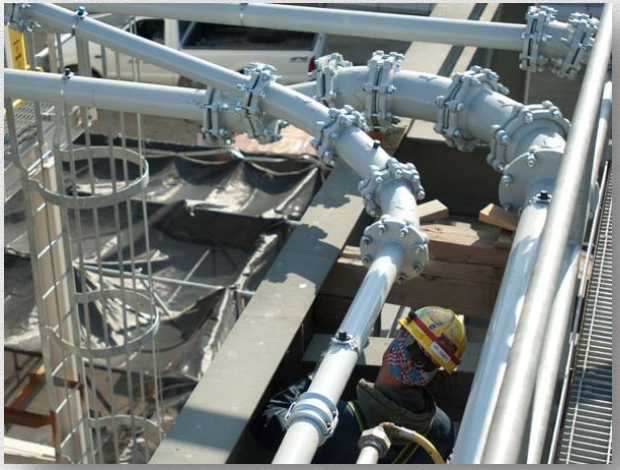
Exterior

Fume hoods

Air-handling systems

Balance of Facilities – Support Operations

20 support buildings for the Balance of Facilities

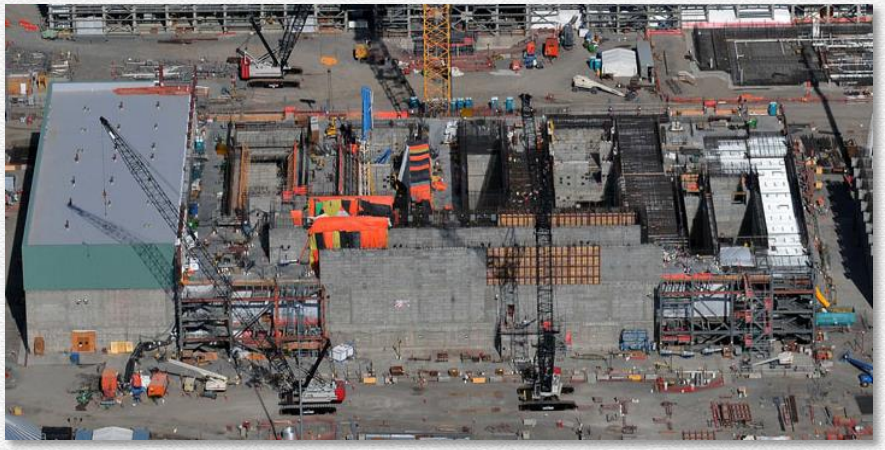


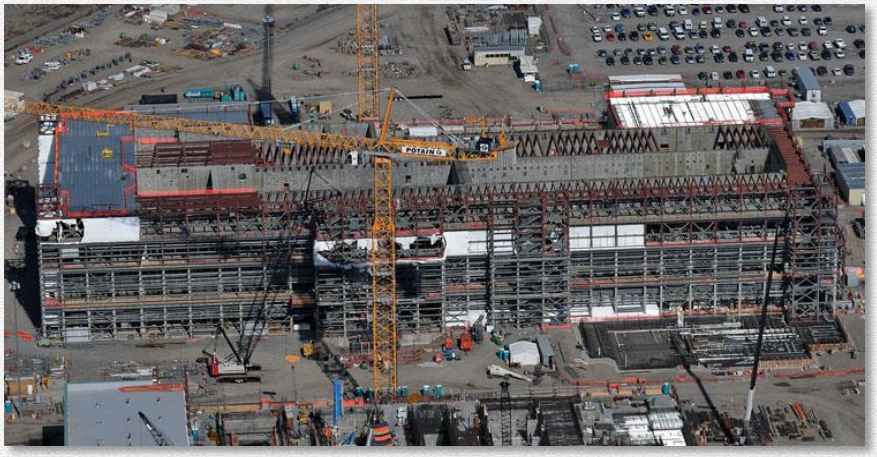
Glass former piping

Overhead pipe racks for steam and glass former materials

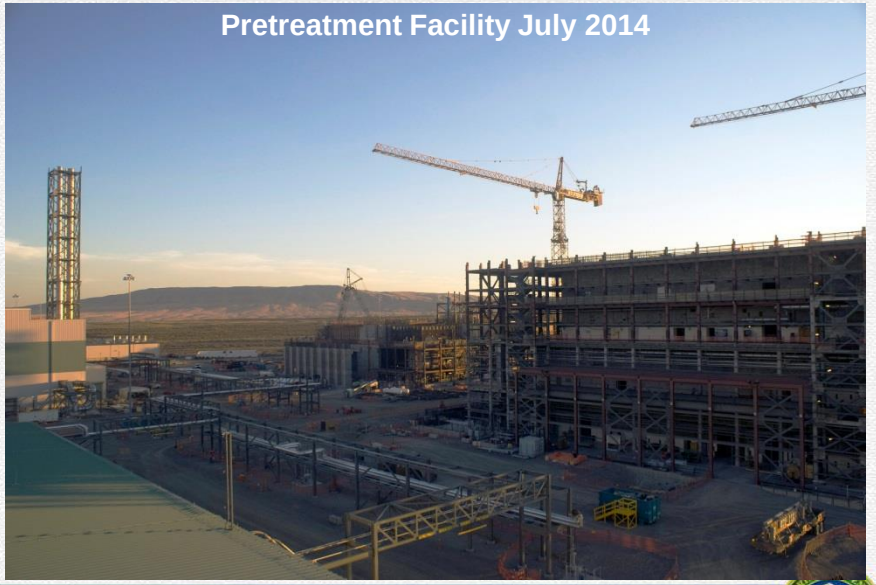
Glass former silos

High-Level Waste and Pretreatment Facilities



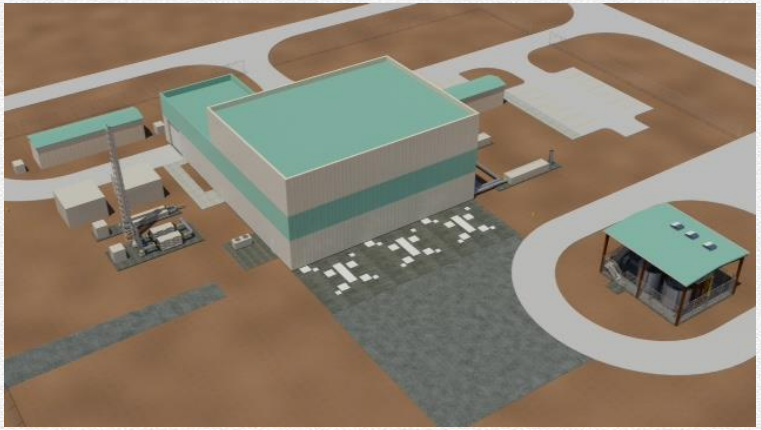


High-Level Waste Facility July 2014

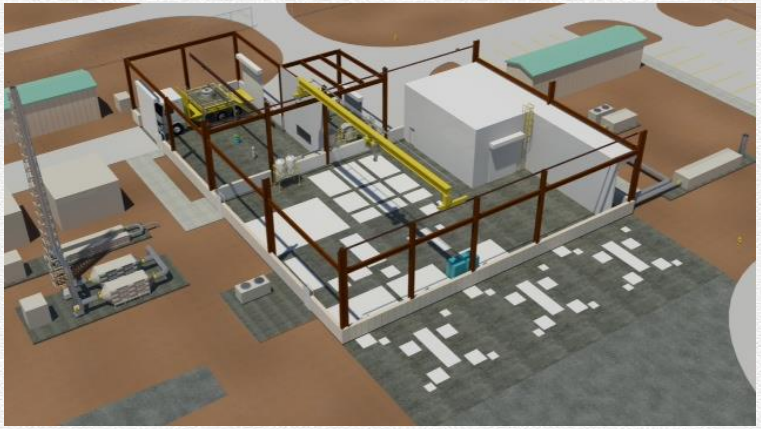


Pretreatment Facility July 2014

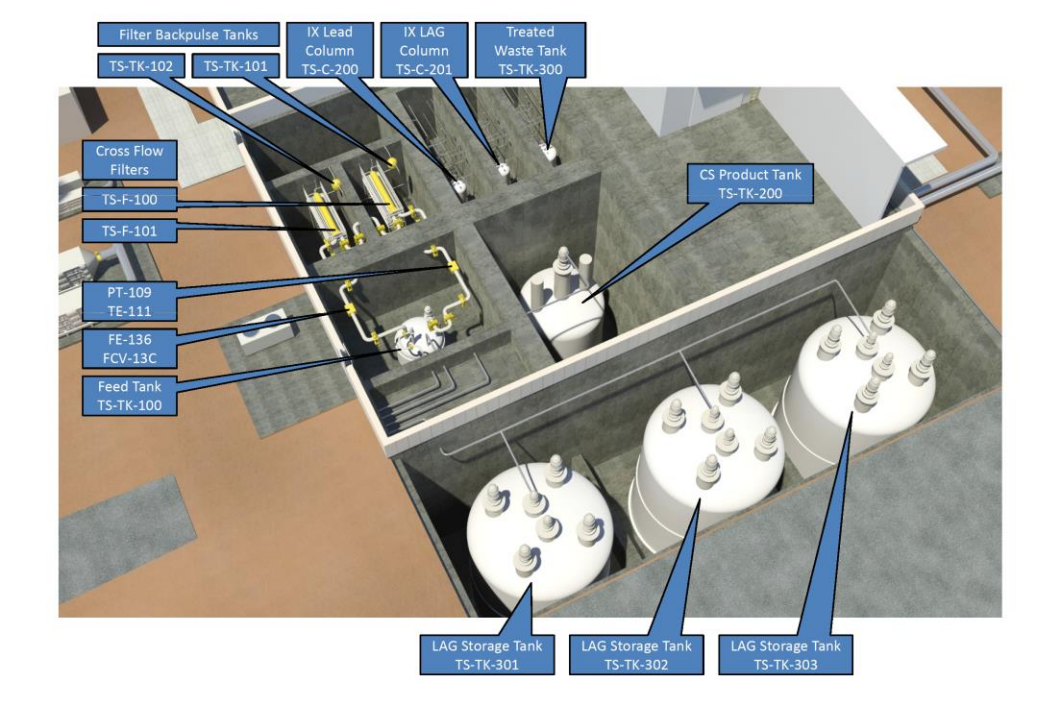
Low-Activity Waste Pretreatment System



Artist Concept of Low-Activity Waste Pretreatment System



Structural steel to support bridge crane



Low-Activity Waste Pretreatment System process looking belowground

2014 Grand Challenge Workshop – Results

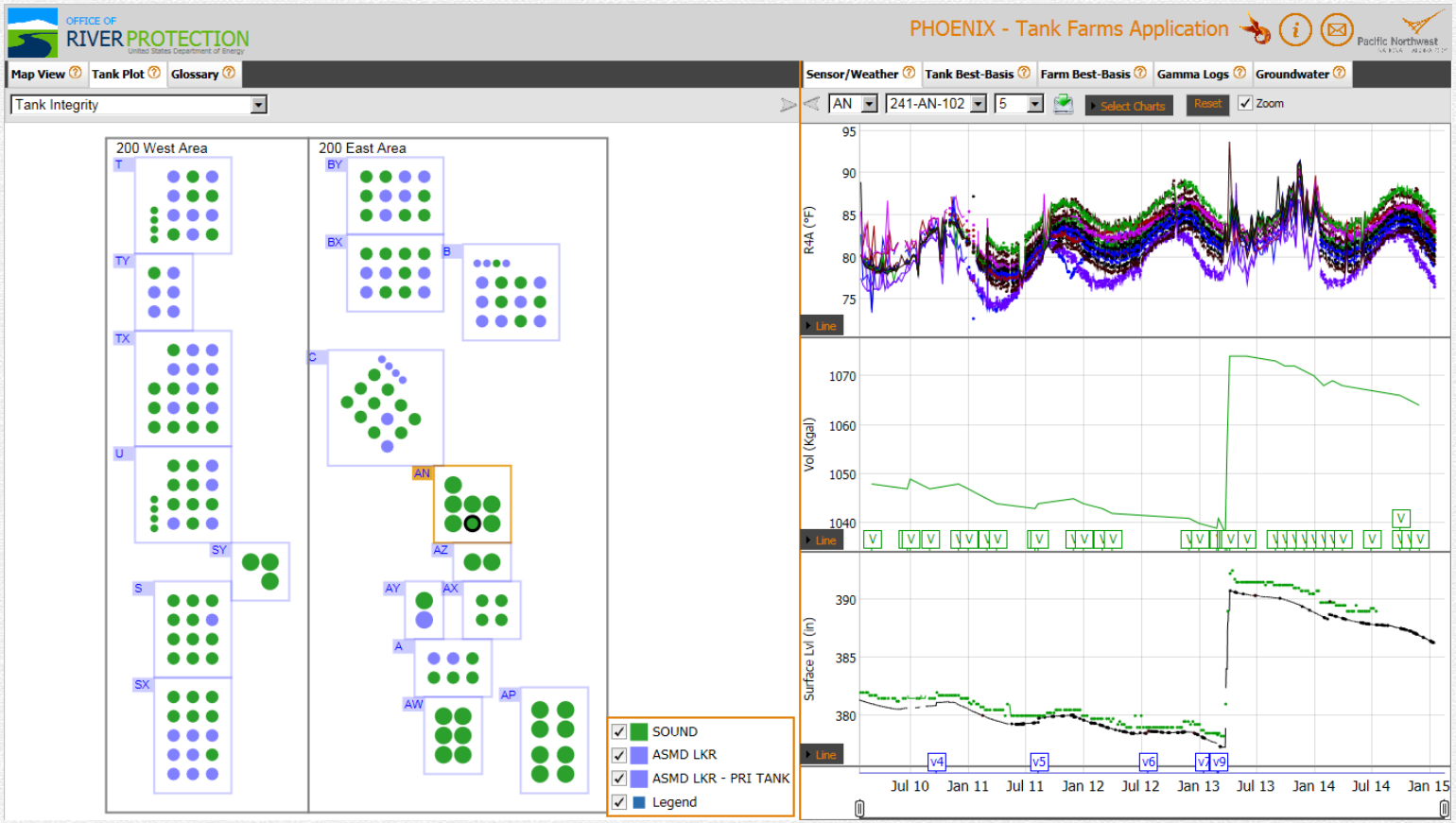
- Forty-four proposals/ideas submitted, evaluated, and scored
- Top 11 ideas were presented to workshop participants
- Top three ideas selected for potential implementation:
  1. Simple methods for solving spray leak, confinement, ammonia BLEVE, stack sample, and air locks
  2. Destruction of noxious vapors with ultraviolet light
  3. Development of a Hanford SST farm passive breather filter abatement
- Top three ideas are being reviewed by ORP federal staff and expect to formally transmit them to Washington River Protection Solutions LLC for its evaluation and potential implementation

PHOENIX Tank Farms Application

- Transparent and open access to multiple data sets that aid understanding of tank farms and tank waste storage conditions
- Uses Pacific Northwest National Laboratory's PHOENIX technology that also provides access to groundwater monitoring and other Hanford environmental data sets
- Enables access to and visualization of:
  - Leak status and other basic information about SSTs and DSTs
  - Historical and current in-tank sensor data: Surface level, interstitial liquid level, temperature readings
  - Tank/farm waste volume by phase (sludge, supernate, saltcake)
  - Tank-specific inventory (Best Basis Inventory)
  - Drywell gamma logging results for selected tank farms
  - Tank volume and waste transfer history
  - Trends in key groundwater contaminants (Central Plateau only)
  - Multiple Hanford Site geographic information system layers: facilities, waste sites, wells, etc.
  - And more…
- Followup presentation and demonstration to be provided to the Hanford Advisory Board Tank Waste Committee

PHOENIX Tank Farms Application (continued)

PHOENIX application is accessible over the internet using standard web browsers at http://tanks.pnnl.gov



2015 Key Cleanup Priorities – Safety First!

- Safe Nuclear Operations and Base Operations
  - Low-Activity Waste Facility, Balance of Facilities, Analytical Laboratory
    - Direct-Feed Low-Activity Waste
      - Tank Waste Retrievals
        - Effluent Treatment Facility Transfer
          - High-Level Waste Physical Issues Resolution
            - Pretreatment Technical Issues Resolution

ORP's Challenges

- Aging Tank Farm Infrastructure
  - Low-Activity Waste Pretreatment System Project Execution
    - Quality Standards and Records for Nuclear Operations
      - Integrating Tank Farm and Waste Treatment and Immobilization Plant for Startup and Operations
        - Technical Issues Resolution
          - Experienced, Appropriately Skilled Work Force

Safety Always Comes First!

Thank you

The Hanford Reach
White Bluffs Overlooking the Columbia River