Hanford Advisory Board

U.S. Department of Energy, Office of River Protection
Agency Update
## Fiscal Year 2014 and 2015 Budget Overview

<table>
<thead>
<tr>
<th>Project Baseline Summary</th>
<th>Project Baseline Summary Title</th>
<th>Fiscal Year (FY) 2014 Omnibus Budget ($ in 000s)</th>
<th>FY 2015 President’s Budget ($ in 000s)</th>
<th>FY 2015 Omnibus Budget ($ in 000s)</th>
<th>FY 2016 President’s Budget ($ in 000s)</th>
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</thead>
<tbody>
<tr>
<td>ORP-0014</td>
<td>Radioactive Liquid Tank Waste Stabilization and Disposition</td>
<td>$520,216</td>
<td>$522,000</td>
<td>$522,000</td>
<td>$649,000</td>
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<tr>
<td>ORP-0014</td>
<td>15-D-409, Low-Activity Waste Pretreatment System</td>
<td>$0</td>
<td>$23,000</td>
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<td><strong>Subtotal</strong></td>
<td>Radioactive Liquid Tank Waste Stabilization and Disposition</td>
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<td>ORP-0060</td>
<td>Waste Treatment and Immobilization Plant (WTP) – Subprojects A-D</td>
<td>$510,000</td>
<td>$575,000</td>
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<td>ORP-0060</td>
<td>WTP – Subproject E</td>
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<td><strong>Subtotal</strong></td>
<td>Major Construction – WTP</td>
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<td><strong>Total – ORP</strong></td>
<td>Office of River Protection (ORP) Funding Summary</td>
<td>$1,210,216</td>
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</table>
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).

C-Farm Retrieval Status

- In Progress
- Complete
- Under Review

Additional Precautions
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

Annulus
Primary (Inner) Tank
~24"

Secondary (Outer) Tank
~9.5'

30"
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

- Analytical Laboratory
- Pretreatment Facility
- Low-Activity Waste Facility
- High-Level Waste Facility
- Balance of Facilities (20 support buildings)

July 2014
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

Overhead pipe racks for steam and glass former materials

Glass former piping

Glass former silos
High-Level Waste and Pretreatment Facilities
Low-Activity Waste Pretreatment System

Artist Concept of Low-Activity Waste Pretreatment System

Structural steel to support bridge crane
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