



OFFICE OF
RIVER PROTECTION
United States Department of Energy

Agency Update

Hanford Advisory Board

Kevin Smith, Manager

Presented by: U.S. Department of Energy – Office of River Protection

December 7, 2016





Mission

To safeguard the nuclear waste stored in Hanford's 177 underground tanks, and to manage the waste safely and responsibly until it can be treated in the Waste Treatment and Immobilization Plant for final disposition.

Vision

To be a high-performing, innovative organization that is safety-conscious and employee-focused, and committed to achieving our mission with environmental and fiscal responsibility.





Office of River Protection (ORP)

ORP is responsible for planning, integrating, and managing the River Protection Program executed by contractors performing work under ORP management. ORP has ~225 employees, both federal and contractor.

Washington River Protection Solutions (WRPS)

WRPS is the prime contractor responsible for safely managing and operating the Tank Farms. WRPS has 2,094 employees*.

Bechtel National, Inc. (BNI)

BNI is responsible for the engineering, construction, startup and commissioning of the Waste Treatment and Immobilization Plant. BNI has 3,044 employees*.

Wastren Advantage, Inc. (WAI)

WAI is the prime contractor responsible for managing the 222-S Laboratory. WAI has 56 employees.*



*As of September 30, 2016







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

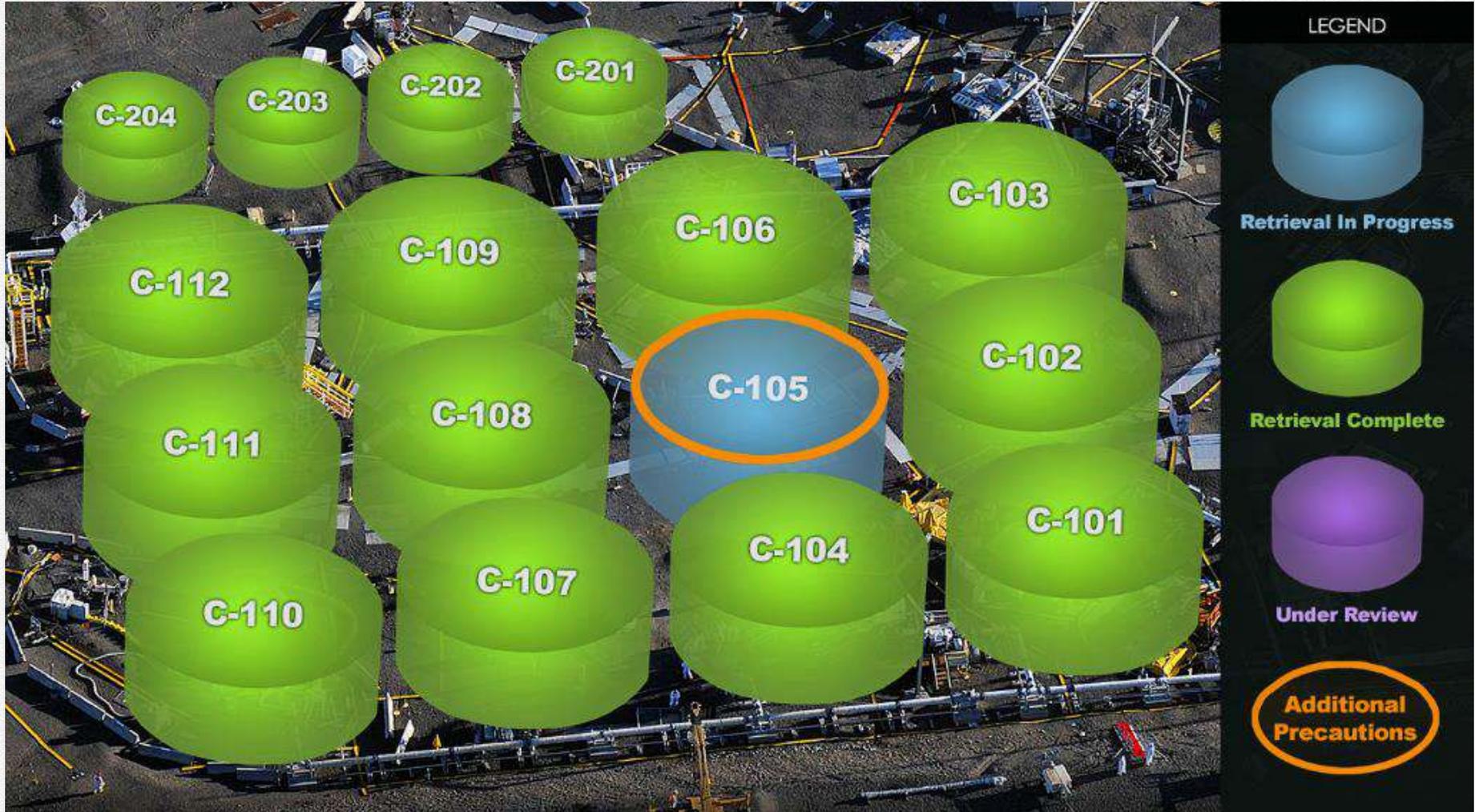




Tank Farms Update



C Farm Retrieval Status





AX infrastructure

- Installed and cold tested two 3000 cfm exhausters and their support systems in AX farm
- Installed the air/water service building that will support retrievals in A/AX (A-285)

AX-102/AX-104

- Completed 6 of 8 pit cleaning and

equipment removals

- Performed demolition of four buildings that needed to be removed to support equipment installations

A Farm

- Completed exhauster system and skid design
- Installed new ingress/egress trailers





- 95% of waste retrieved (~595k/700k gal)
- 4 extended-reach sluicers installed
- Retrieval activities expected to resume this month
- Deadline to complete retrieval March 4, 2017



Above: Workers installed four extended-reach sluicers in tank AY-102 this summer to resume retrieval of the remaining sludge waste in the tank.

Above left: The extended-reach sluicers will allow operators to maneuver around 22 large vertical pipes in the tank, called air-lift circulators, that help cool the waste.





- Amended Consent Decree requires purchase of spare “reboiler” for the 242-A Evaporator by end of 2016
- Vendor has been hired to design and fabricate this equipment
- Additional reboiler will help ensure Evaporator campaigns continue to support tank retrievals
- Existing reboiler is 40 years old



An additional reboiler, *left*, is being designed and built for the 242-A Evaporator, *above*, to ensure tank retrieval operations continue without delays.





- Direct Reading Instruments
- Total volatile organic content (VOC)
 - Limited specific chemical analyses
- Spectroscopic Instruments
 - Chemical species information
- Real-time detection & monitoring
- Meteorological data
- Worker location
- Proton Transfer Reaction-Mass Spectrometry (PTR-MS) Mobile Laboratory
- Wireless data stream into existing Tank Farm Operations and Industrial Hygiene programs
- Dispersion modeling

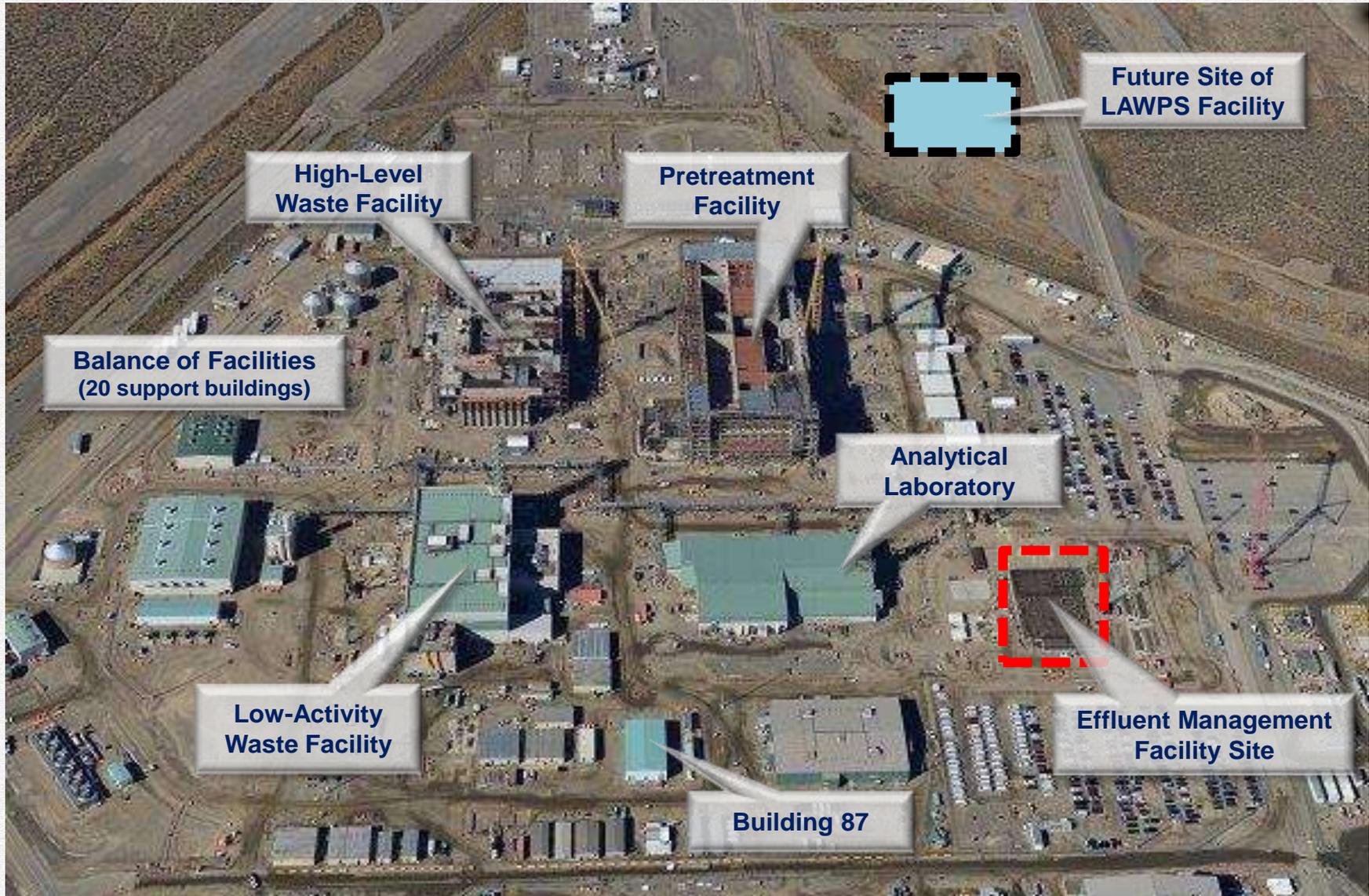




Waste Treatment & Immobilization Plant

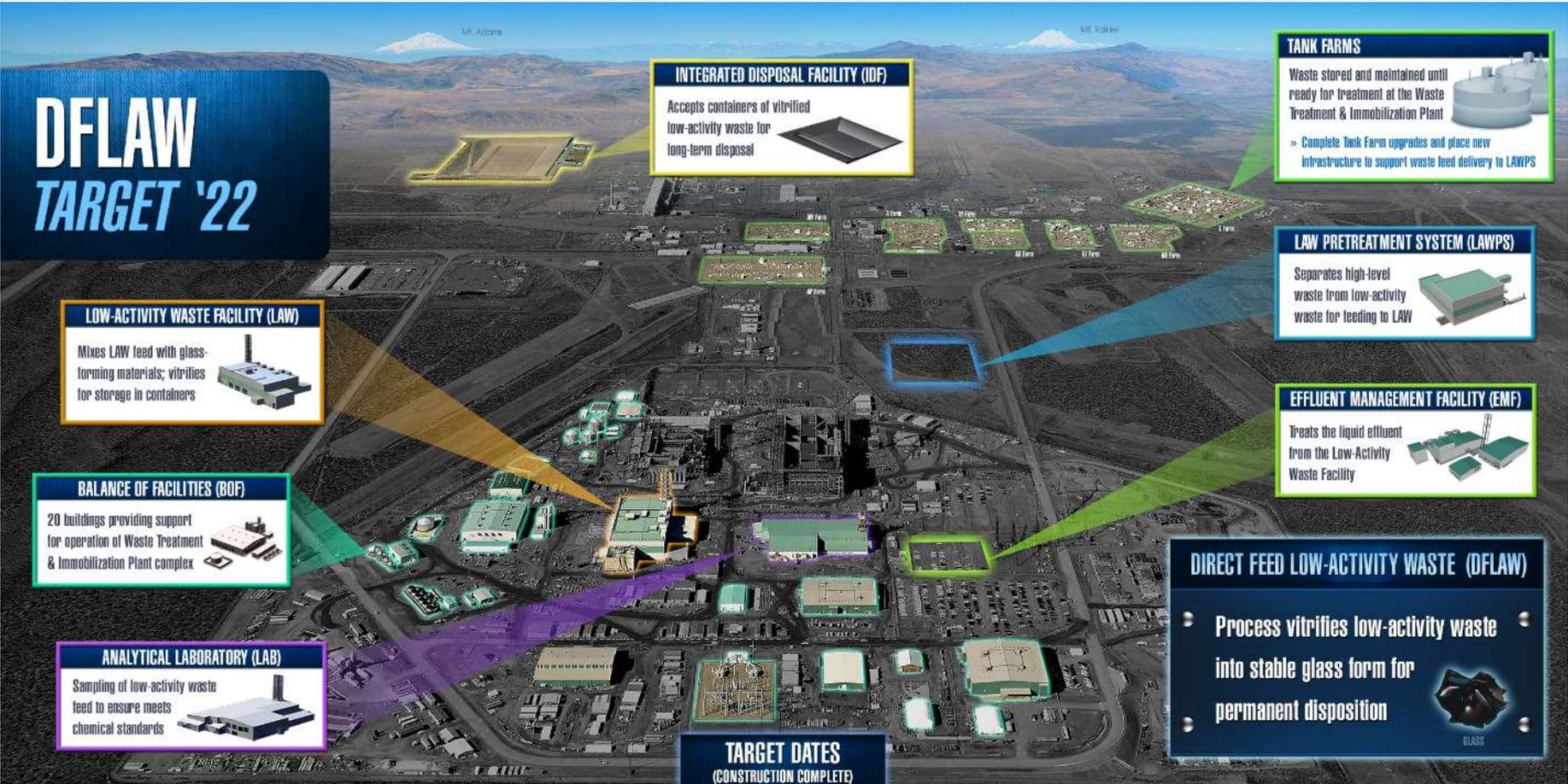


Waste Treatment and Immobilization Plant (WTP)





DFLAW TARGET '22



TARGET DATES
(CONSTRUCTION COMPLETE)

| 2006 | 2012 | 2018 | 2018 | 2019 | 2021 | 2022 | 2022 |
|------------------------------|-----------------------|-----------------------|-----------------------------|------------------------------|--|-------|----------------|
| INTEGRATED DISPOSAL FACILITY | ANALYTICAL LABORATORY | BALANCE OF FACILITIES | LOW-ACTIVITY WASTE FACILITY | EFFLUENT MANAGEMENT FACILITY | LOW-ACTIVITY WASTE PRETREATMENT SYSTEM | DFLAW | LAW CONTAINERS |

This graphic display is not to scale





WTP building gets permanent power supply

- Building 87 first facility in WTP complex to be supplied by permanent power
- Building's energization represents transition from temporary construction-phase to permanent utilities to operate WTP
- Significant increase in pace of construction, startup & commissioning activities expected over next few years



Building 87 switchgear components went through months of testing and verification before being energized in mid-September.





Key LAW Facility Equipment Arrives

- Caustic scrubber, the last major piece of LAW equipment, was received mid-November
- Thermal catalytic converter, ammonia skid key to completion of LAW Facility also installed this year
- Equipment is all part of a system that removes contaminants from LAW melter exhaust & ensures off-gas meets regulatory requirements
- 2018 target for LAW Facility construction complete



Above: Workers completed installation of key exhaust treatment equipment at the WTP's LAW Facility in July.

Left: The caustic scrubber is nearly 30 feet tall and 6 feet in diameter. Once all internal components are installed, it will weigh 19 tons. It is one of three key components that make up the offgas treatment system.







FY 2017 Budget



(\$ in Thousands)

| PBS | Project Baseline Summary (PBS) Title | FY 2016 Appropriation | FY 2017 President Budget |
|--------------------|--|--------------------------|-----------------------------|
| ORP-0014 | Radioactive Liquid Tank Waste Stabilization and Disposition | \$ 649,000 | \$ 721,456 |
| ORP-0014 | 15-D-409, Low Activity Waste Pre-Treatment System | \$ 75,000 | \$ 73,000 |
| Subtotal | Radioactive Liquid Tank Waste Stabilization and Disposition | \$ 724,000 | \$ 794,456 |
| | | | |
| ORP-0202 | General Plant Project (GPP) | \$ 0 | \$12,509 |
| | | | |
| ORP-0060 | WTP – Subprojects A-D | \$ 595,000 | \$ 593,000 |
| ORP-0060 | WTP – Subproject E | \$ 95,000 | \$ 97,000 |
| Subtotal | Major construction – Waste Treatment Plant (WTP) | \$ 690,000 | \$ 690,000 |
| | | | |
| ORP-0070 | WTP Commissioning | \$ 0 | \$3,000 |
| Total – ORP | Office of River Protection Funding Summary | \$1,414,000 | \$1,499,965 |





Special topics selected for Hanford Advisory Board



- Website launched in June and expanded in October provides workers, public real-time updates
- People are invited to subscribe to receive notices when new information is posted

www.hanfordvapors.com





- Newly developed face shield protects workers who are wearing respiratory protection from arc flashes
- Previous equipment did not protect against both
- WRPS received the Voluntary Protection Program Innovation Award for leading development of the face shield
- Equipment is now being used by all tank farm electricians



WRPS received the Voluntary Protection Program Innovation Award at a national conference in Kissimmee, Fla.





Learn more about the vit plant with videos, displays, photos, interviews and more at the virtual open house

A promotional graphic for the Vit Plant Virtual Open House. It features a purple background with a faint map of the Hanford site. In the top left is the Vit Plant logo, a circular seal with 'VIT PLANT' and 'EST. 1989'. To the right, the text reads 'Vit Plant Virtual Open House' in large white letters, followed by the website 'www.hanfordvitplant.com/openhouse' and the hashtag '#meetthevit'. Below this text are three inset images: a large industrial storage tank, a central play button icon over a wide shot of the facility, and an aerial view of a building complex.

www.hanfordvitplant.com/openhouse





3 Technical Issues Near Resolution

| Technical Issue | Status of Resolution |
|------------------------------------|--|
| T-1 Hydrogen Gas Events in Vessels | <ul style="list-style-type: none">• ORP is currently reviewing the Waste Treatment and Immobilization Plant (WTP) Contractor Engineering Study supporting revised control strategy. Expect resolution in fourth quarter calendar year (CY) 2016. |

| Technical Issue | Status of Resolution |
|--------------------------------|---|
| T-2 Criticality in PJM Vessels | <ul style="list-style-type: none">• ORP has reviewed and accepted an updated WTP Criticality Safety Evaluation Report and Engineering Study evaluating heavy plutonium particulate treatment in the PT Facility. Expect resolution in fourth quarter CY 2016. |

| Technical Issue | Status of Resolution |
|--|--|
| T-3 Hydrogen in Piping and Ancillary Vessels | <ul style="list-style-type: none">• ORP is currently evaluating a preliminary documented safety analysis change package, consequence calculation, and proposed update to the WTP design basis to resolve the hydrogen in piping and ancillary vessel issue. Expect resolution in fourth quarter CY 2016. |





Full-Scale Test Vessel installed; pulse jet mixer control tests to begin in December





Mark Edgren, ORP chief of staff, left, presents Larry Shaffer and Clinton Summers with a plaque announcing their Grand Challenge-winning proposal.

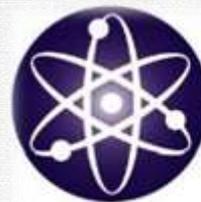




- DOE focused on promoting activities in the fields of Science, Technology, Engineering & Math (STEM)
- ORP has implemented engineering case study at universities
- Presentations at colleges, high schools highlight the scientific work done at Hanford
- DOE staff participate in scientific-related community events and serve as judges in the annual Mid-Columbia Science and Engineering Fair



The two grand prize winners of the Mid-Columbia Science and Engineering Fair displayed their presentations for staff at the Office of River Protection earlier this year.



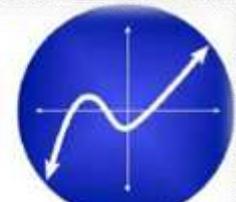
Science



Technology



Engineering



Mathematics





New Consent Decree Deadlines

| Milestones | 2010 Consent Decree | 2016 Consent Decree (Amended) |
|---|----------------------------|--------------------------------------|
| LAW Facility Construction Substantially Complete | 12/31/2014 | 12/31/2020 |
| Start LAW Facility Cold Commissioning | 12/31/2018 | 12/31/2022 |
| LAW Facility Hot Commissioning | 12/31/2019 | 12/31/2023 |
| Complete C Tank Farm retrievals | 9/30/2014 | 3/31/2024 |
| Complete retrievals from 9 additional SSTs | 9/30/2022 | 3/31/2024 |
| Pretreatment Facility Hot Commissioning | 12/31/2019 | 12/31/2033 |
| HLW Facility Hot Commissioning | 12/31/2019 | 12/31/2033 |
| WTP Hot Start | 12/31/2019 | 12/31/2033 |
| WTP Begin Initial Operations | 12/31/2022 | 12/31/2036 |





Special Recognition





Thank you, Steve!





"Protecting our workers, the public, and the environment"

The Hanford Reach
White Bluffs Overlooking the Columbia River





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