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

March 1, 2017

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.

Our Team

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.*

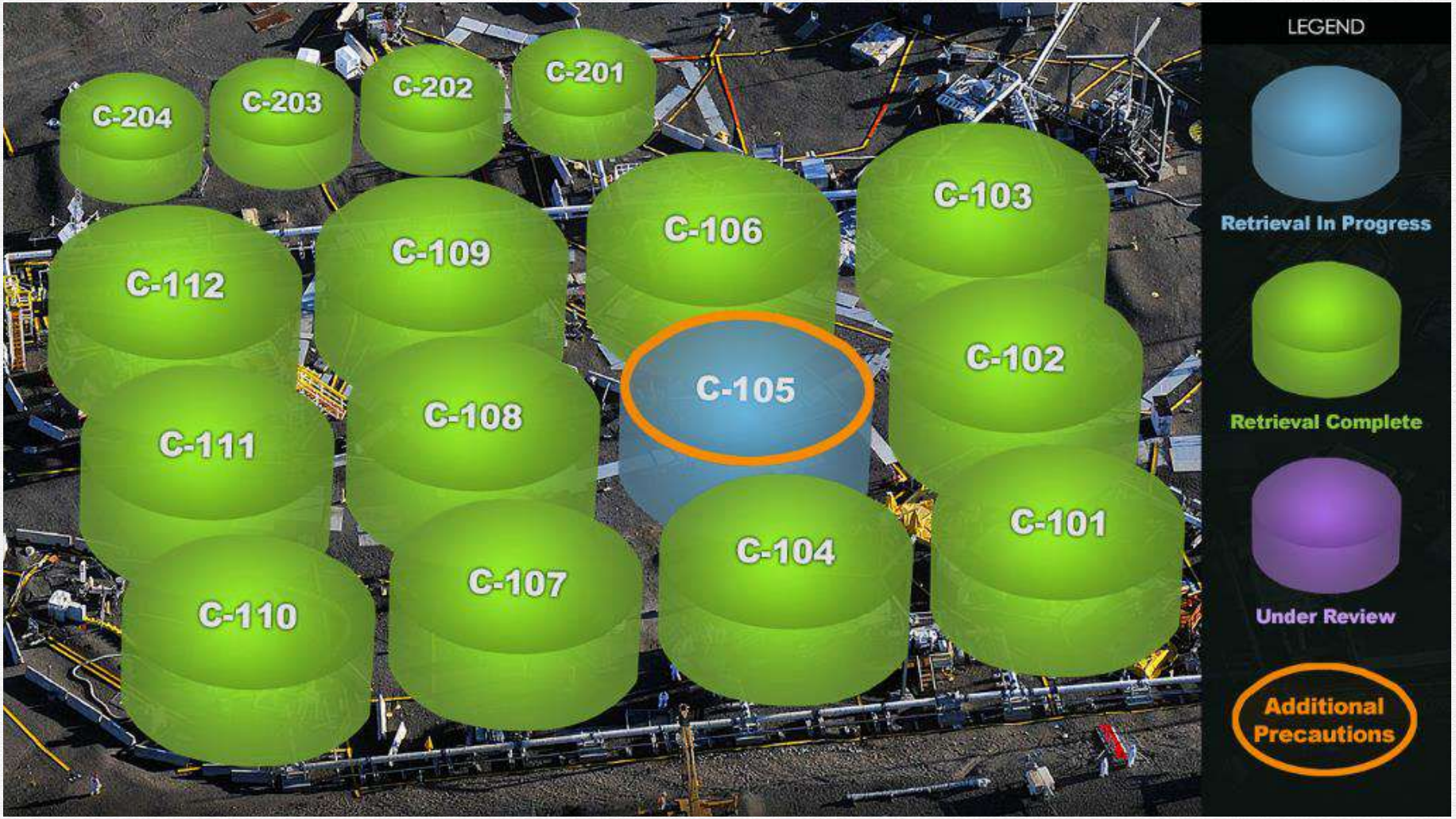
*As of September 30, 2016


HANFORD REACH
WASHINGTON
HANFORD
CENTRAL PLATEAU
Tank Farms
Waste Treatment Plant
200 West Area
200 East Area
HANFORD REACH
300 Area

River Protection Project

Tank Farms Update

C Farm Retrieval Status



A-AX Single-Shell Tank Farms

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

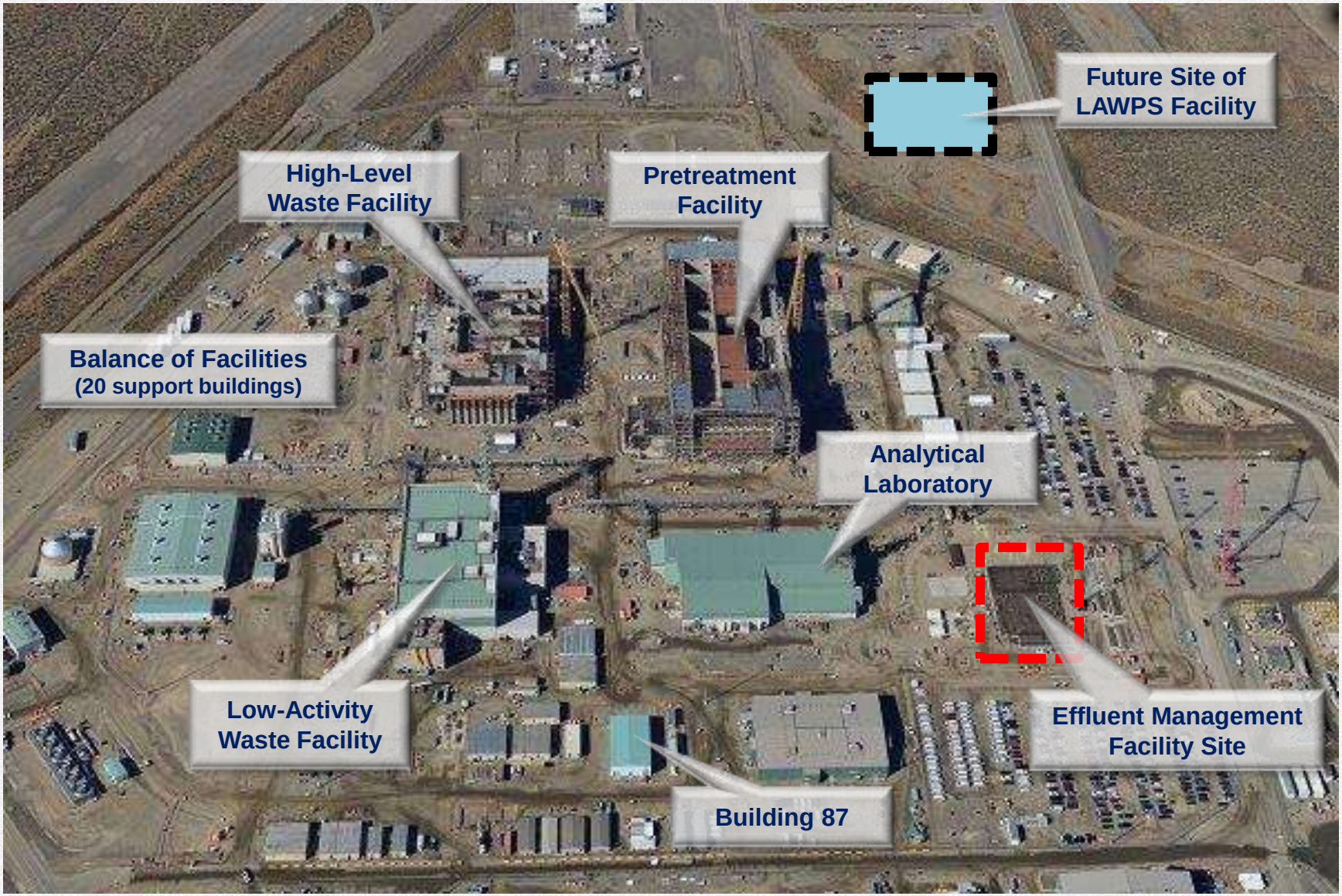
242-A Evaporator & Effluent Treatment Facility

- More than 5.5 million gallons of waste treated by the Effluent Treatment Facility since restart last May
- Next Evaporator campaigns planned for June 2017 timeframe

Since 1995, the Effluent Treatment Facility has treated water contaminated with low levels of radioactive and chemical waste primarily from the 242-A Evaporator (top left), groundwater treatment systems, waste disposal operations and Hanford's K Basins. In Fiscal Year 2016, the facility processed 4 million gallons of waste water.

Waste Treatment & Immobilization Plant

Waste Treatment and Immobilization Plant (WTP)

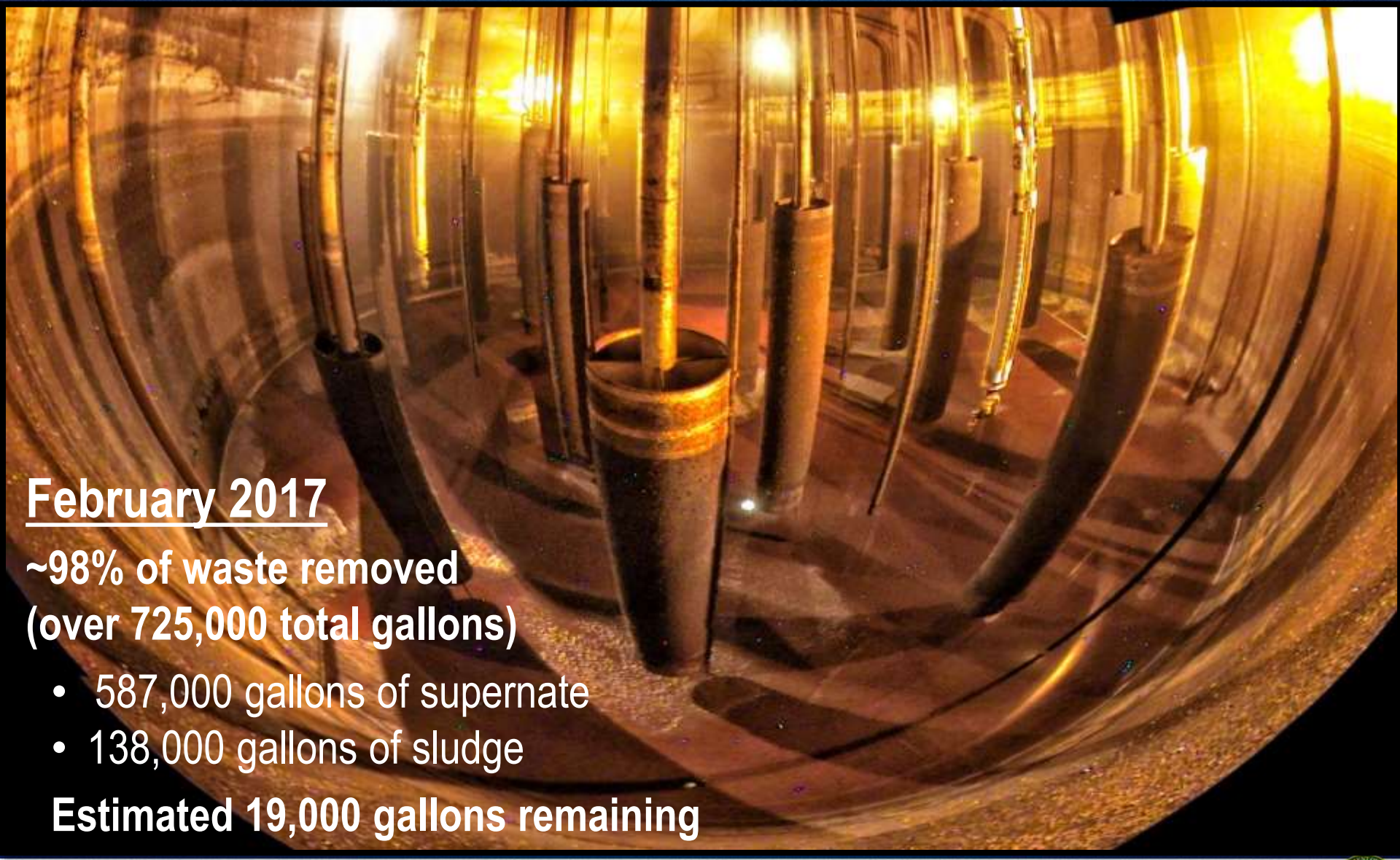


Vit Plant Receives 25-Ton Crane for HLW Melter Cave

The crane will be installed in HLW melter cave two where its 25-ton lifting capacity will be used to help move support equipment during installation and maintenance of the 90-ton melter.

Special topics selected for Hanford Advisory Board

AY-102 Retrieval Progress



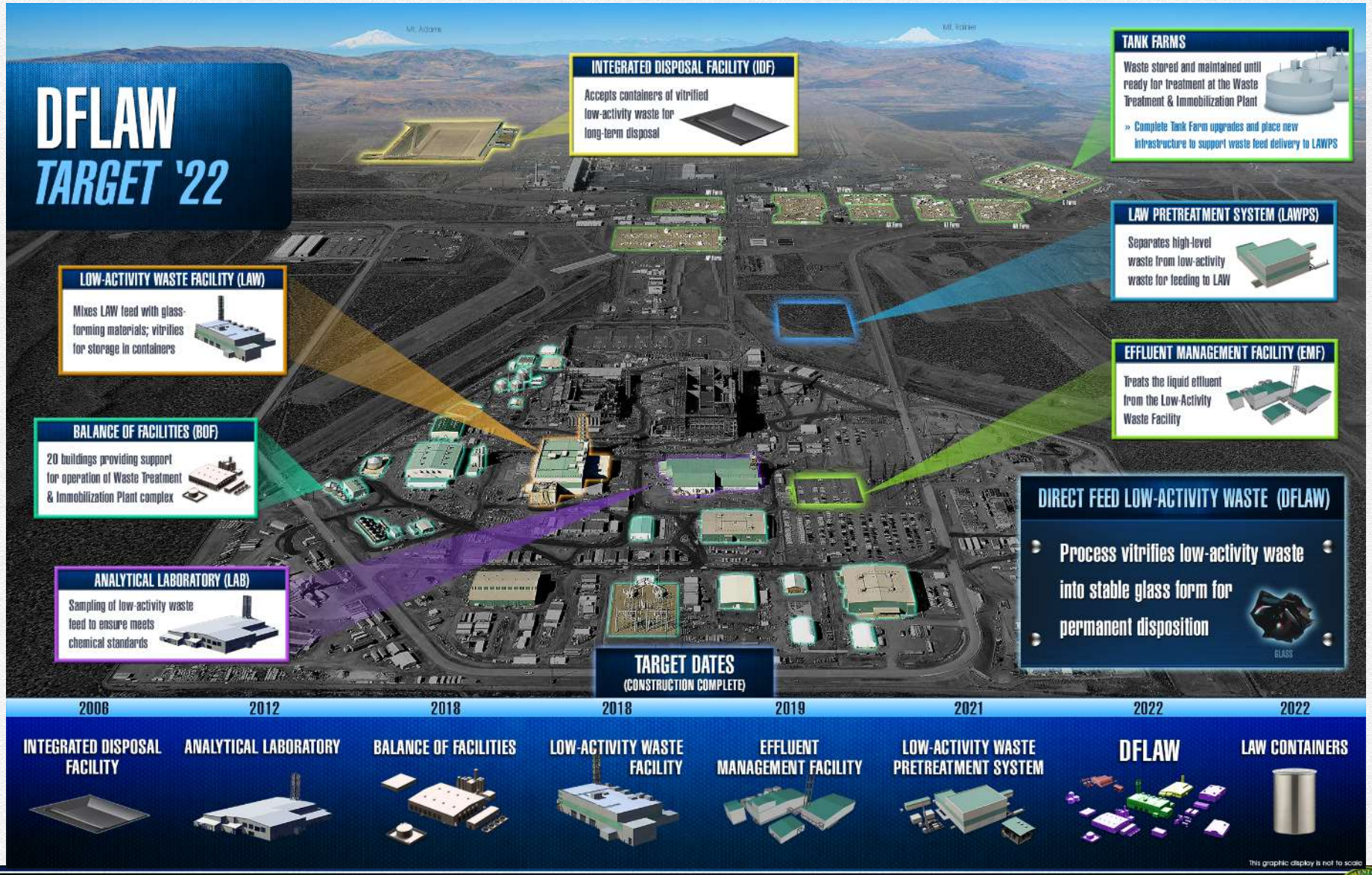
February 2017

~98% of waste removed
(over 725,000 total gallons)

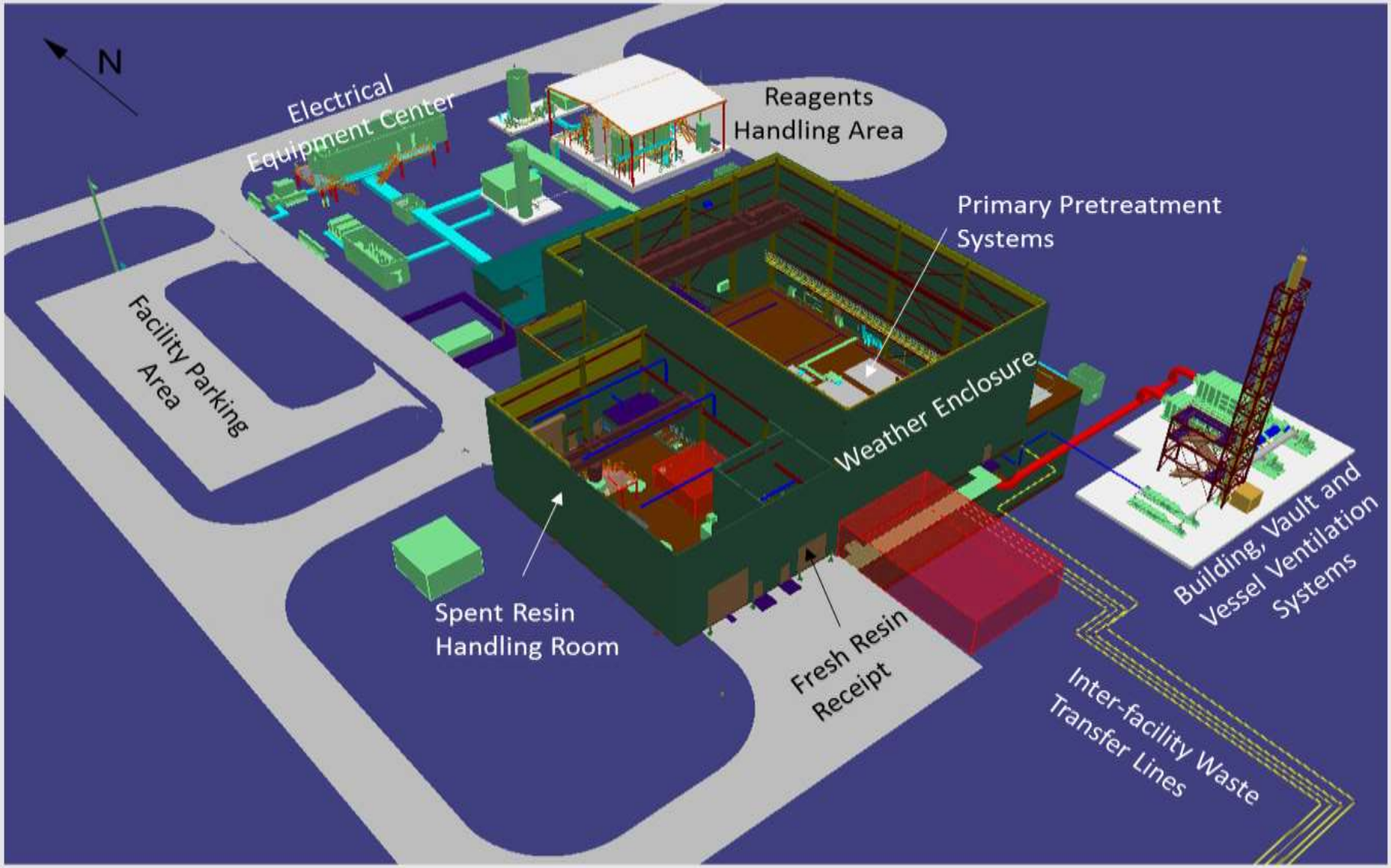
- 587,000 gallons of supernate
- 138,000 gallons of sludge

Estimated 19,000 gallons remaining

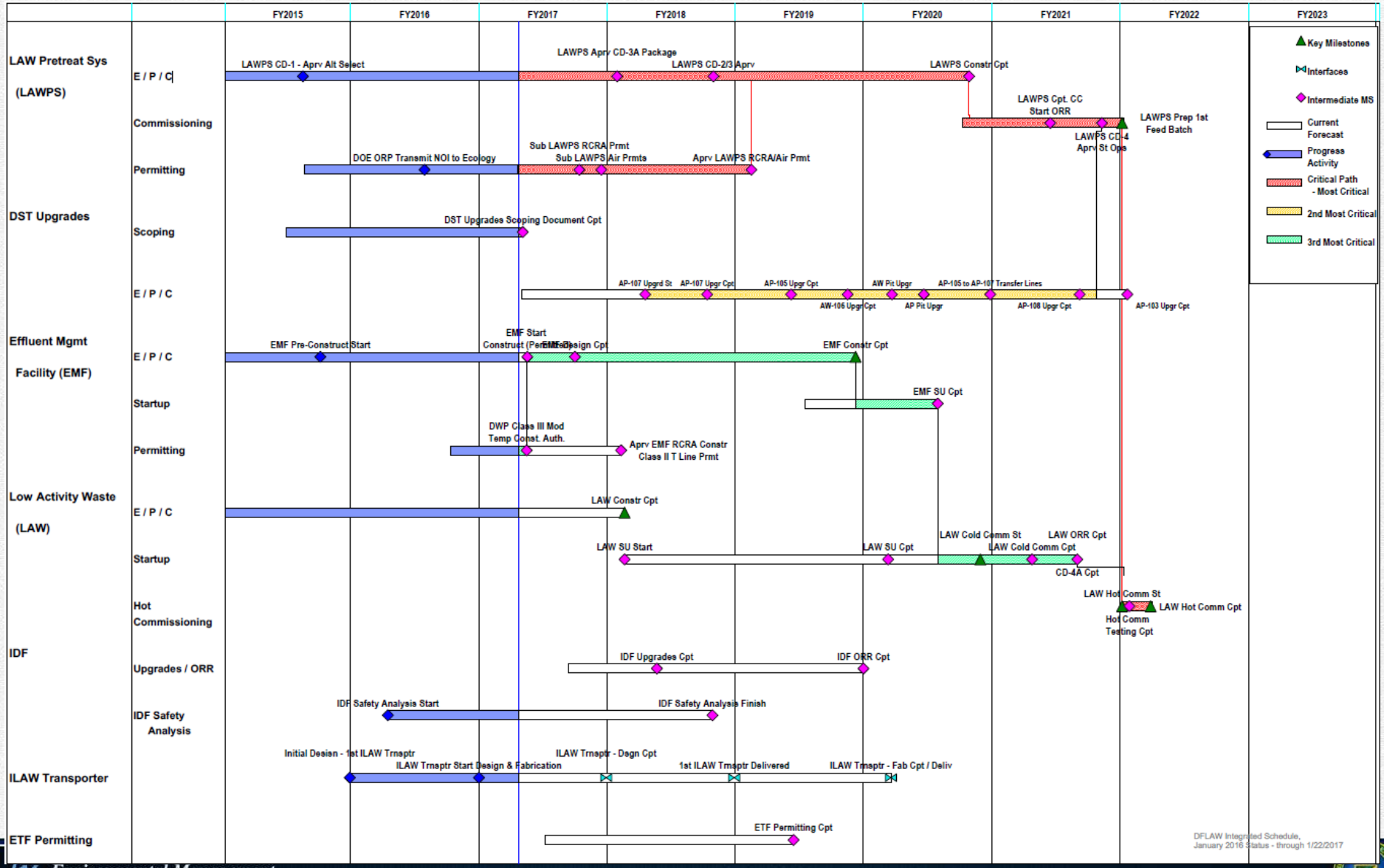
DFLAW Facility Overview



LAWPS Facility Design



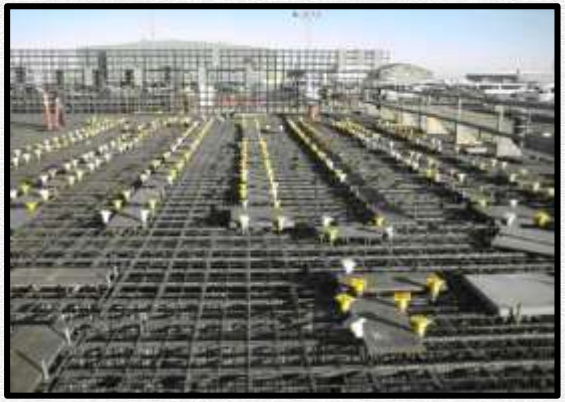
DFLAW Critical Path Schedule



DFLAW Critical Path Analysis

- The DFLAW Program critical path flows through the LAWPS Project and the preparation of the LAWPS RCRA TSD Permit application (dependent upon input from preliminary design data), followed by the approval of the Permit. This will allow the project to commence construction.
- Upon completion of construction, the LAWPS Project critical path flows through commencement of Start-up and Operational Acceptance Testing, followed by a Management Self-Assessment leading into the Operational Readiness Review (ORR). Following the ORR, LAWPS will prepare the first radioactive waste feed to support commencement of LAW Facility Hot Commissioning Testing.
- The critical path to the completion of LAW Hot Commissioning is currently showing 14 days positive float to complete on January 15, 2022.

Physical Progress at WTP



Video: Vit Plant Progress

https://youtu.be/qwTwi_olc-Y

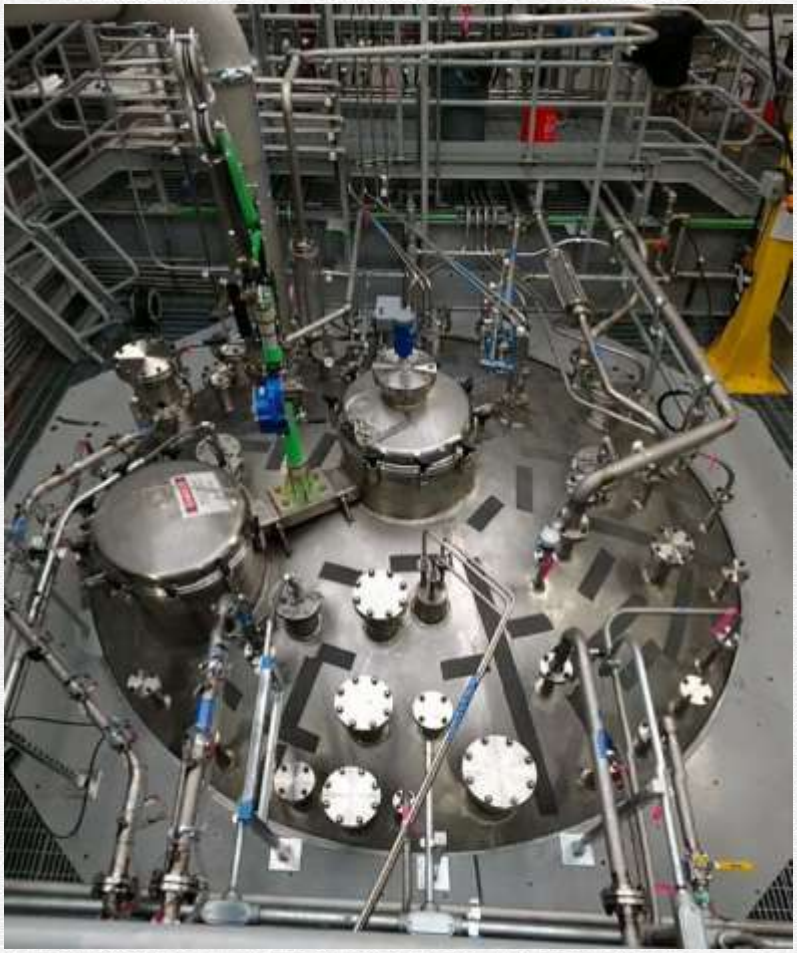
Pretreatment Facility Technical Issues

T1 Hydrogen Gas Events in Vessels	➢ Risk of combustion in the headspace of high-solids vessels due to hydrogen accumulation ➢ Resolved with approval of revised hydrogen safety control strategy consisting of both preventive and mitigative safety and process controls
T2 Criticality in Pulse-Jet Mixer (PJM) Vessels	➢ Dense fissile particles could settle on the bottom of WTP vessels with sufficient mass and geometry such that a criticality event is credible ➢ Issue resolved via calculations, engineering and chemistry studies, criticality safety evaluations, and integrated process controls
T3 Hydrogen in Piping and Ancillary Vessels	➢ Flammable gases generated by waste treated in WTP could accumulate in process piping and cause deflagration event ➢ Resolved by updating WTP safety basis, basis of design, and process piping design criteria to prevent or control potential hydrogen explosions
T4 PJM Vessel Mixing and Control	➢ Concern with adequacy of PJM mixing and control system ➢ Complete testing of standard high solids vessel prototype
T5 Erosion/Corrosion in Piping and Vessels	➢ Uncertainties exist in waste feed characteristics and ability to meet 40-year service life ➢ Confirm erosion/corrosion design basis, including margin, through testing and analysis
T6 Design Redundancy/ In Service Inspection	➢ Perform failure modes, effects, and criticality analysis ➢ Complete conceptual design of Planning Areas 2, 3, and 4
T7 Black Cell Vessel/ Equipment Structural Integrity	➢ Seismic ground motion criteria for Waste Treatment and Immobilization Plant changed around 2005 ➢ Complete structural analysis of standard vessel and strategy for structural upgrades to installed vessels
T8 Facility Ventilation/Process Off-Gas Treatment	➢ Multiple technical challenges associated with ventilation system, including HEPA filters ➢ Complete engineering/nuclear safety assessments to ensure ventilation meets requirements

Resolved Testing underway Ongoing

Technical Issues Resolution

Pulse jet mixer control tests underway; testing completion expected end of 2017



An overhead view of the 16-foot-diameter by 35-foot-tall vessel shows the platform and all test equipment installed.

ORP Budget Profile

($ in Thousands)

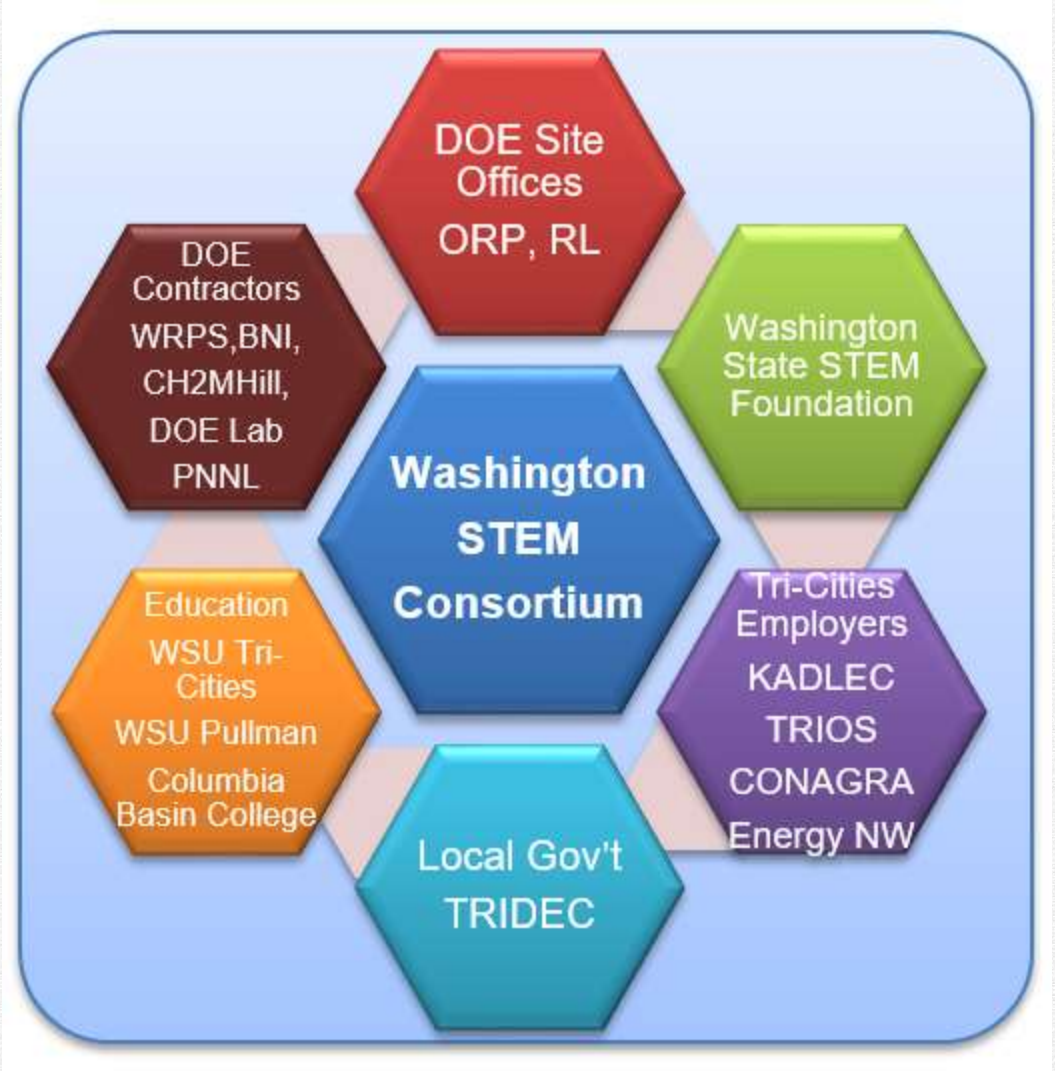
PBS	Project Baseline Summary (PBS) Title	Fiscal Year (FY) 2016 Omnibus Enacted	FY 2016 Costs	FY 2016 Carryover	FY 2017 President's Budget	FY 2017 CR Appropriation through Apr 28
ORP-0014	Radioactive Liquid Tank Waste Stabilization and Disposition	$649	$637	$49	$721	$365
ORP-0014	15-D-409, Low Activity Waste Pretreatment System	$75	$39	$51	$73	$43
Subtotal	**Radioactive Liquid Tank Waste Stabilization and Disposition**	**$724**	**$677**	**$101**	**$794**	**$408**
ORP-0060	WTP – Subprojects A-D	$ 595	$624	$141	$593	$341
ORP-0060	WTP – Subproject E	$ 95	$117	$76	$97	$54
Subtotal	**Major construction – Waste Treatment and Immobilization Plant (WTP)**	**$ 690**	**$741**	**$218**	**$690**	**$395**
ORP-0070	WTP Commissioning	$ 0	$0	$0	$3	$0
ORP-0202	General Plant Project (GPP)	$ 0	$0	$0	$12	$0
Total – ORP	**Office of River Protection Funding Summary**	**$1,414**	**$1,419**	**$319**	**$1,499**	**$804**

WRPS Wins National Safety Award

Washington River Protection Solutions received the 2017 Campbell Innovation Challenge award for developing a physiological monitoring program that has eliminated heat stress cases the past two years at the tank farms.

Building Our Future Through STEM

- DOE is focused on educating and inspiring future generations about meaningful careers in Science, Technology, Engineering and Mathematics (STEM) careers in DOE's Hanford workforce.
- Outreach activities include:
  - Mission briefings and site tours for university faculty and students
  - Engineering Case Study as capstone project for students
  - DOE Lecture Series with universities
  - Expanded internship opportunities



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