



OFFICE OF  
**RIVER PROTECTION**  
United States Department of Energy

# Agency Update

# Hanford Advisory Board

Presented by: **Ben Harp, Deputy Manager**

**June 7, 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.





## 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 (WTP). About 2,900 employees work at WTP.

### 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





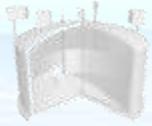




# Tank Farms Update



## 16 TANKS RETRIEVED



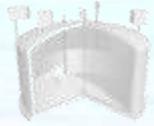
### C-106\*

- Capacity of tank: 530 Kgals
- Volume removed: 189 Kgals
- \*TPA Appendix H exemption request pending



### C-103

- Capacity of tank: 530 Kgals
- Completion date: Aug. 26, 2006
- Volume removed: 75 Kgals



### C-104

- Capacity of tank: 530 Kgals
- Completion date: Aug. 17, 2012
- Volume removed: 257.3 Kgals



### C-107

- Capacity of tank: 530 Kgals
- Completion date: Aug. 9, 2014
- Volume removed: 210.4 Kgals



### C-203

- Capacity of tank: 55 Kgals
- Completion date: March 24, 2005
- Volume removed: 2,501 gallons



### C-204

- Capacity of tank: 55 Kgals
- Completion date: Dec. 11, 2006
- Volume removed: 1,349 gallons



### C-109

- Capacity of tank: 530 Kgals
- Completion date: Sept. 13, 2012
- Volume removed: 62.2 Kgals



### C-112

- Capacity of tank: 530 Kgals
- Completion date: Apr. 18, 2012
- Volume removed: 91.3 Kgals



### C-202

- Capacity of tank: 55 Kgals
- Completion date: Aug. 11, 2005
- Volume removed: 1,253 gallons



### S-112

- Capacity of tank: 758 Kgals
- Completion date: March 2, 2007
- Volume removed: 612 Kgals



### C-110

- Capacity of tank: 530 Kgals
- Completion date: Oct. 15, 2013
- Volume removed: 176.3 Kgals



### C-102

- Capacity of tank: 530 Kgals
- Completion date: Apr. 9, 2015
- Volume removed: 300.5 Kgals



### C-201

- Capacity of tank: 55 Kgals
- Completion date: March 23, 2006
- Volume removed: 718 gallons



### C-108

- Capacity of tank: 530 Kgals
- Completion date: March 22, 2012
- Volume removed: 63.0 Kgals



### C-101

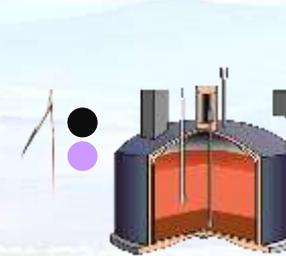
- Capacity of tank: 530 Kgals
- Completion date: Sept. 12, 2013
- Volume removed: 72.5 Kgals



### C-111

- Capacity of tank: 530 Kgals
- Completion date: March 20, 2016
- Volume removed: 27.6 Kgals

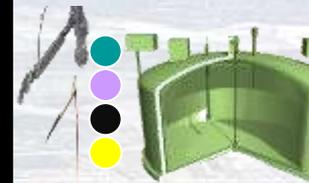
## 1 TANK UNDER REVIEW



### AY-102

- Capacity of tank: 1,000 Kgals
- Volume of waste to be removed: 744 Kgals
- Retrieval began March 2016
- Volume of waste removed: 725 Kgals

## 1 TANK IN RETRIEVAL



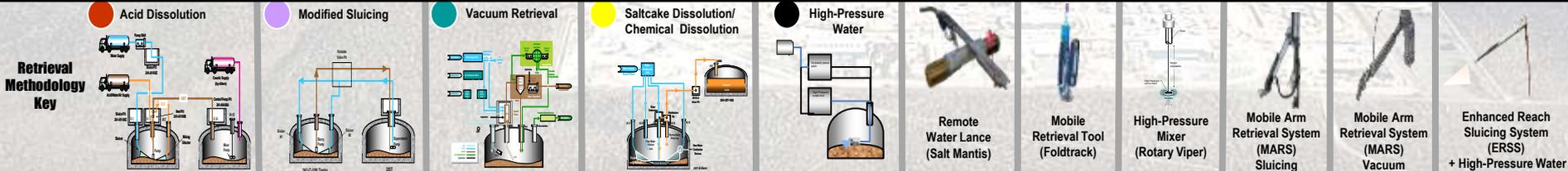
### C-105

- Capacity of tank: 530 Kgals
- Volume of waste to be removed: 30.4 Kgals
- Retrieval began June 2014
- Volume of waste removed to date: 54.9 Kgals

## 4 TANKS PREPARING FOR RETRIEVAL



### AX-101 / AX-102 / AX-103 / AX-104





- Single-shell tank C-105 is the last of 16 tanks to be retrieved in C Farm. Approximately 30,000 gallons of waste remain in the tank.
- Installation of two extended-reach sluicers is nearly complete. The sluicers will be used to help retrieve the remaining waste.
- The final round of retrieval is expected to begin this summer and be completed in late 2017 or early 2018.



Crews check whether a riser will allow for the installation of new equipment needed to complete retrieval.





- Cleaned out eight pits to support long-length equipment removal from tanks AX-102 and AX-104 – the first to be retrieved.
- Cleanout included removal of old jumpers, leak detectors and miscellaneous components.
- Removed first piece of long-length equipment (thermocouple from AX-102).
- Field testing AX exhausters and ventilating AX Farm tanks.
- Continued fabrication of two exhausters to be used to ventilate A Farm tanks during equipment removal/installation and retrieval activities.

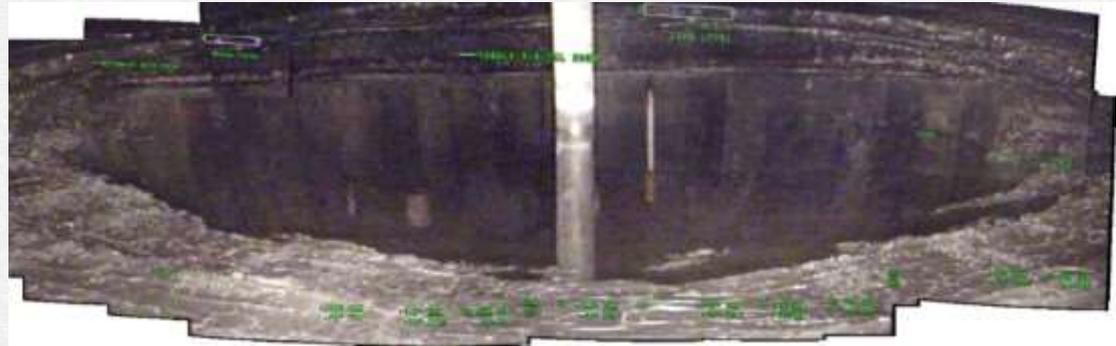


The thermocouple is placed in a grout box and will be shipped to ERDF for permanent disposal.





- T-111 exhauster operated for 7,382 hours between July 2015 and December 2016.
- Estimated 7,150 gal of water removed (~6,400 from sludge; ~750 from pool)
- Volume of water evaporated is equivalent to over 10 years' worth of leakage at estimated 2014 leak rate (~1.8 gal/day).



Tank T-111 Pool on June 2, 2015

Edge of pool  
at start of  
exhauster  
operation.



Tank T-111 Pool on November 16, 2016



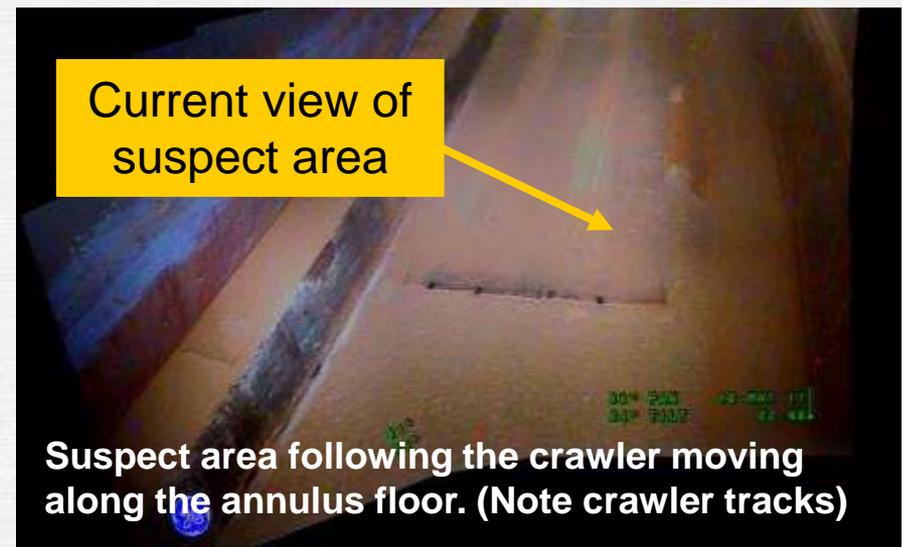
- More than 7.6 million gallons of waste water has been processed at the Effluent Treatment Facility since the facility restarted in May 2016.
- Work is underway to replace the 20-year-old fabric cover on one of the three large Liquid Effluent Retention Facility's (LERF) storage basins (Basin 43).
- New LERF cover is expected to be installed by end of summer.
- Each of the LERF basins is permitted to hold ~7.8 million gallons of material



Work to install a new cover for LERF Basin 43 is expected to be completed this summer.



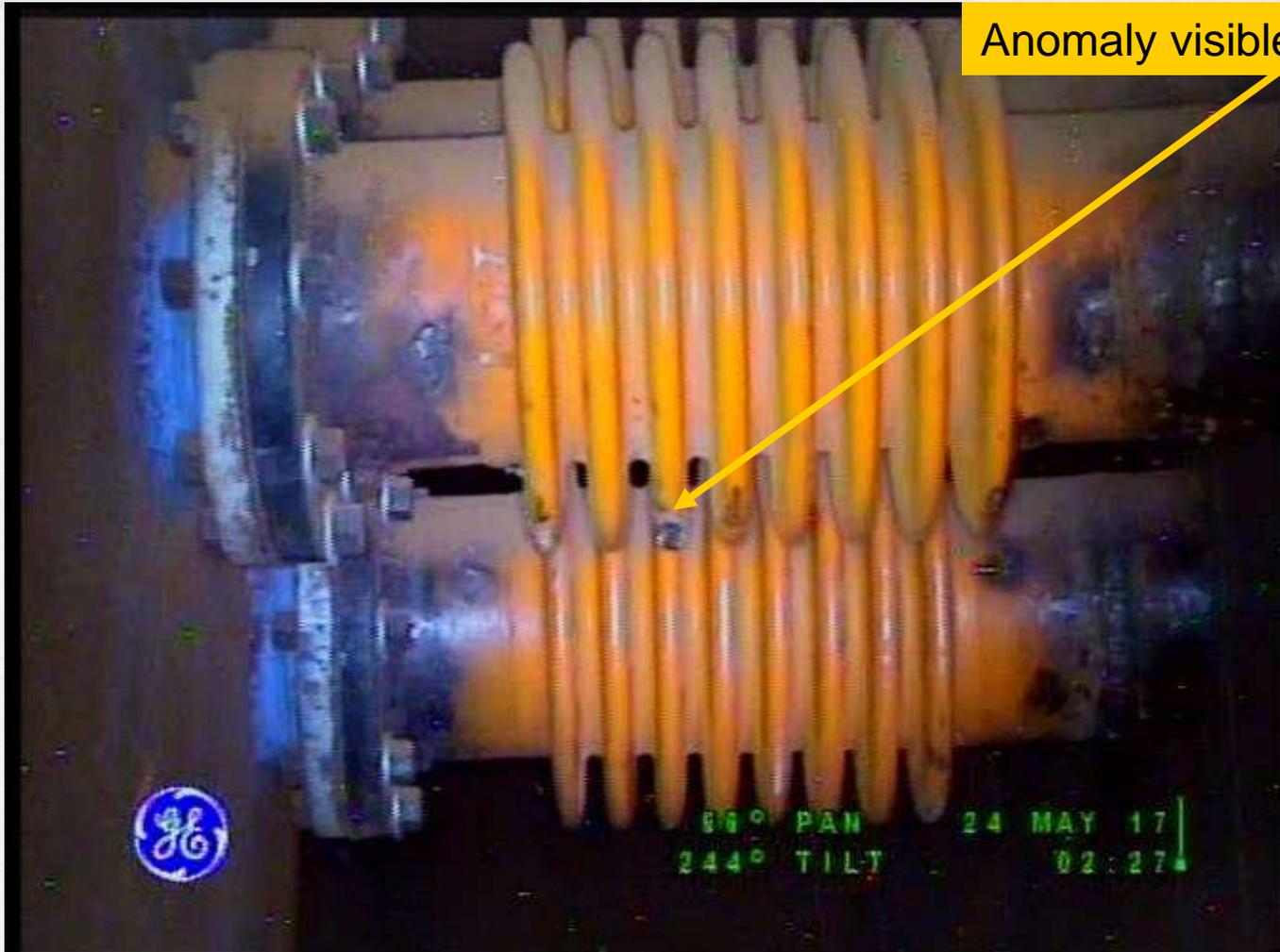
- Unexpected contamination was found May 18 on a robotic crawler conducting planned inspection of double-shell tank AZ-101 annulus.
- Initial investigation shows contamination was not the result of a primary tank leak.
- Radioactive material analyzed from crawler not consistent with contents of AZ-101.
- ORP and WRPS evaluating other potential sources.
- Visual inspection of 95% of annulus is ongoing.
- Data to be reviewed by Tank Integrity Expert Panel.







# Current View of AZ-101 Bellows

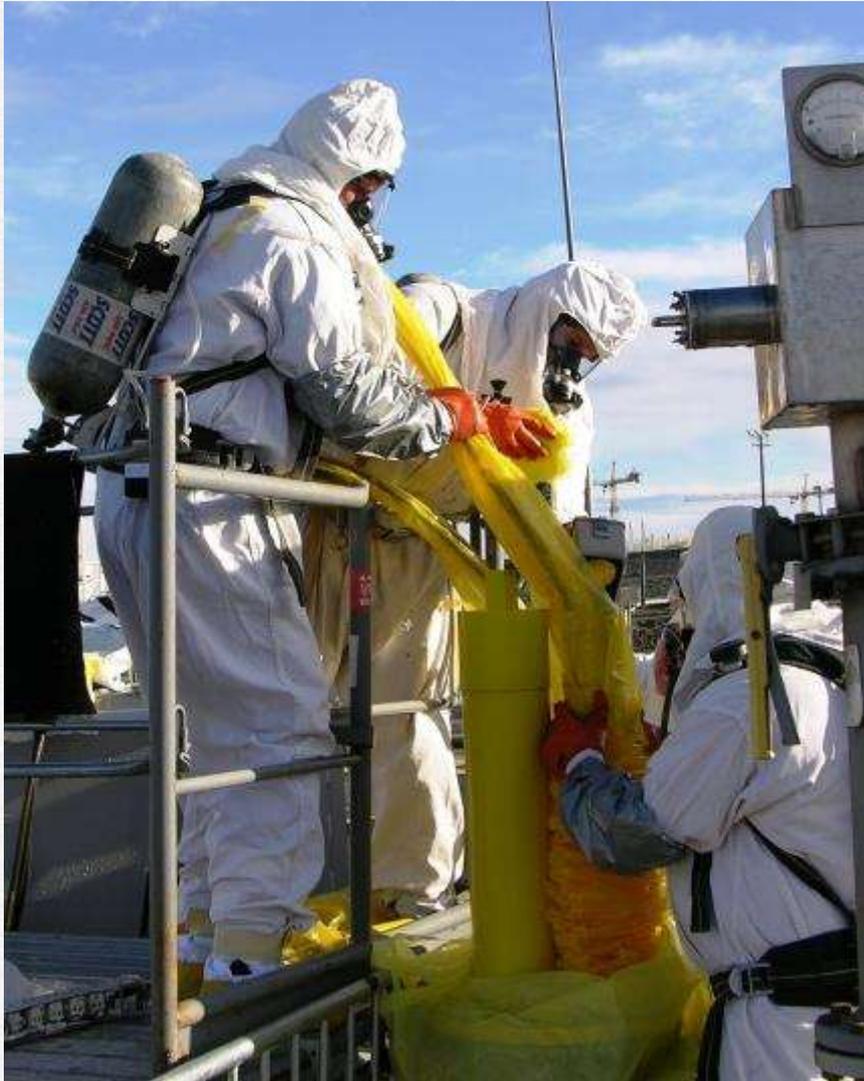


Anomaly is almost directly above the spot observed in the annulus









- Work underway to extend 242-A Evaporator stack from 65 feet above ground to 111 feet above ground.
- Down-select of detection and monitoring technologies is underway.
- Air-purifying respirator filter cartridge testing continues.
- Visit [www.HanfordVapors.com](http://www.HanfordVapors.com) for more information.





**Tank Vapor Assessment Team (TVAT) Recommendations**



**Phased Implementation Plan (IP)**



**Additional Recommendations from  
Workforce and External Assessments**



**Hanford Vapors Integrated Safety Management Strategy**



**Comprehensive Vapor Action Plan (CVAP)**



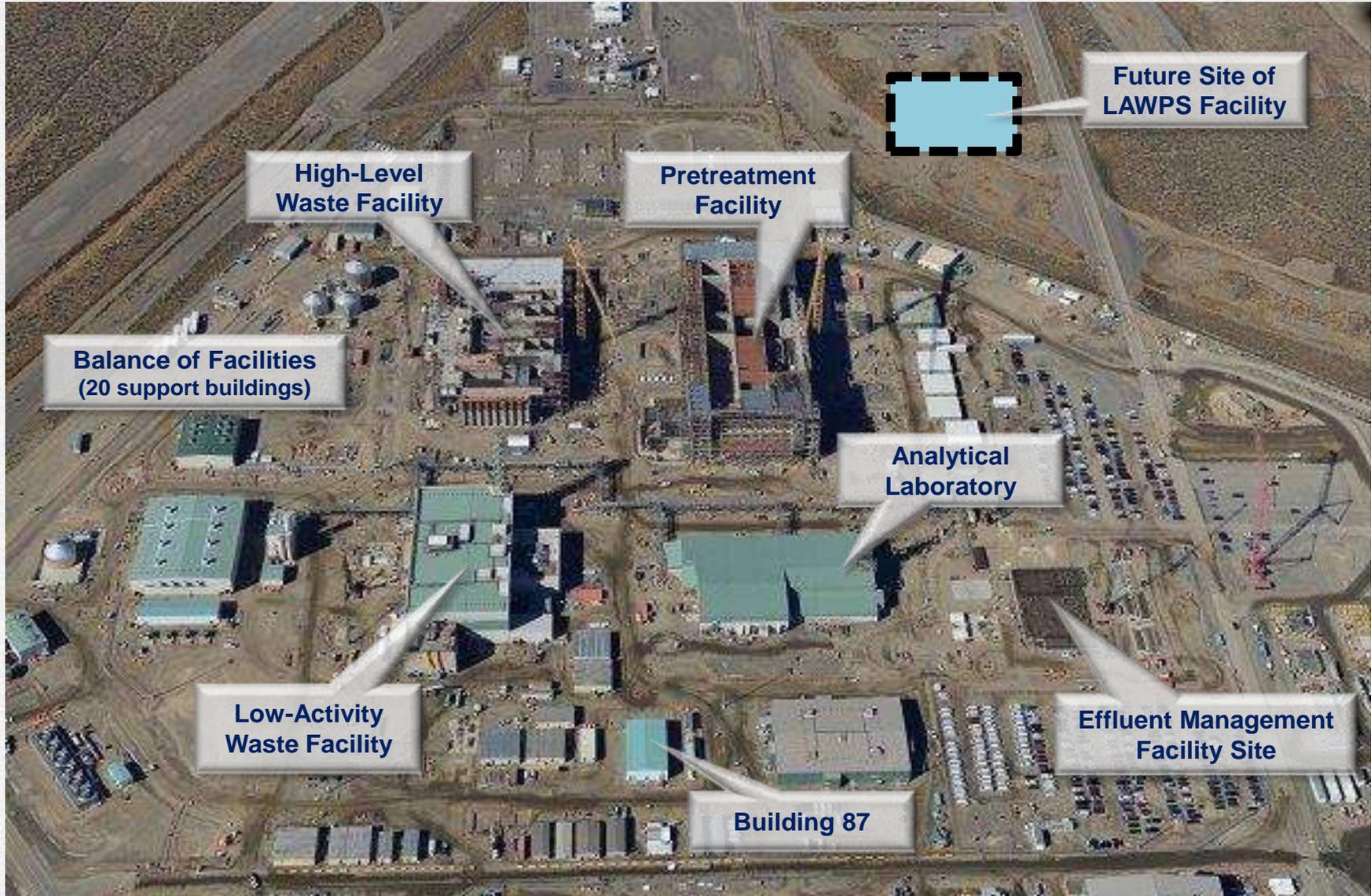


# Waste Treatment & Immobilization Plant



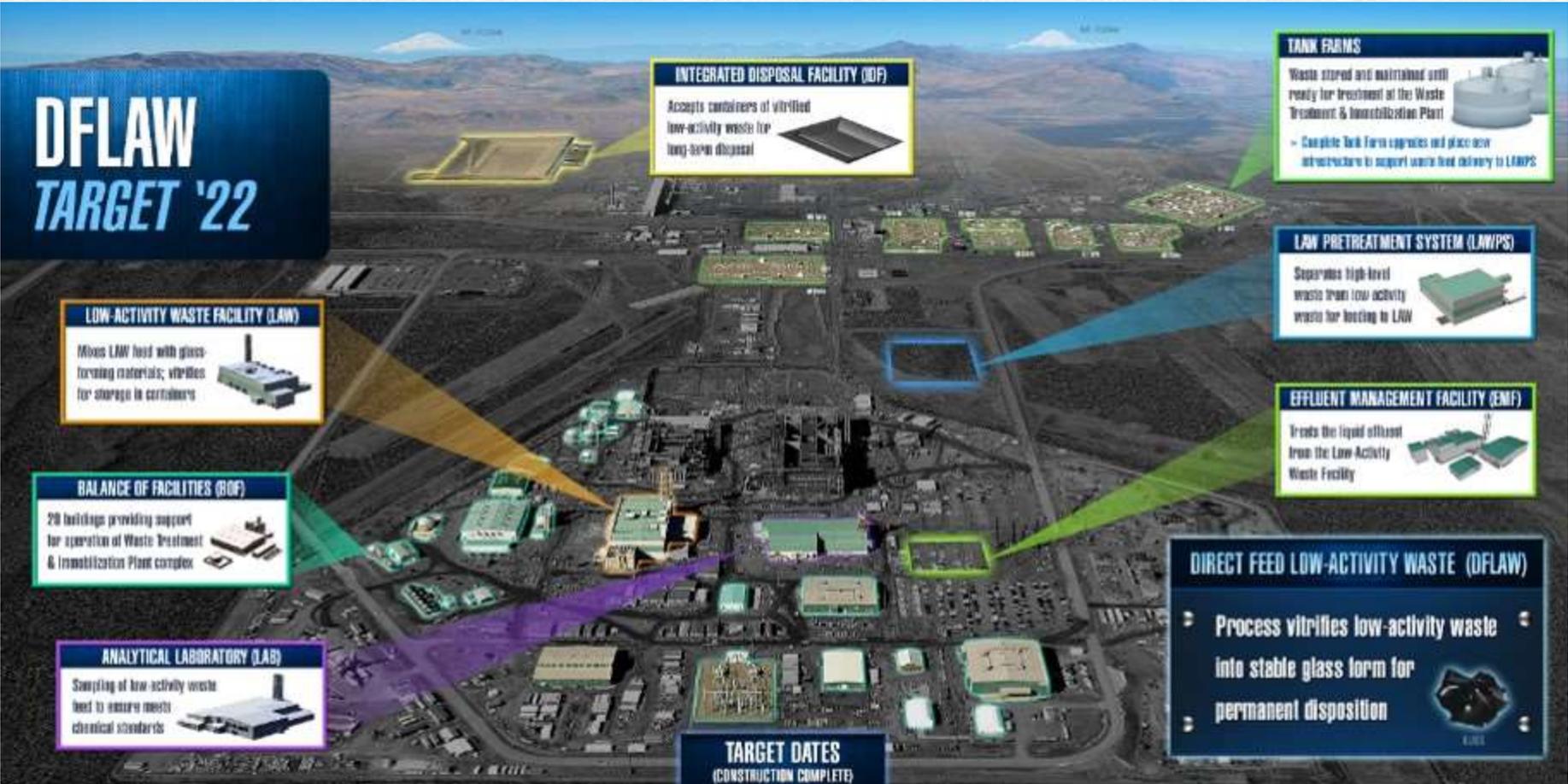


# Waste Treatment and Immobilization Plant (WTP)





## DFLAW TARGET '22



**TARGET DATES**  
(CONSTRUCTION COMPLETE)

2006	2012	2018	2018	2018	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.





# Caustic Scrubber Installation Completed in LAW Facility

The caustic scrubber is nearly 30 feet tall, 6 feet in diameter and weighs 14 tons. Once all the internal components are installed, it will weigh 19 tons. It is one of three major components that make up the offgas treatment system.



The caustic scrubber was lowered into the LAW Facility by crane through a roof hatch. The scrubber was installed on Feb. 6, 2017.





- **Above:** The final assembly for two Low-Activity Waste Facility melters is on pace for completion.
- **Right:** Three autosamplers were received at the High-Level Waste Facility. This equipment will verify glass-forming mixture and sample liquid waste before transfer to Pretreatment Facility.



- **Above:** The Balance of Facilities switchgear building, also known as Building 91, was energized in March.





- Completed 60% Design Review.
- Preliminary Safety Design Report in review.
- Developing system testing reports.
- Preparing Permit Modification Request documents to transmit to Ecology.
- Requesting HQ authorization to begin site preparation and fabrication of selected equipment.
- Anticipating full construction start by early FY 2019.





	Project Schedule	Contract	BCP	Amended Consent Decree
LAW Construction Substantially Complete	Nov 2017	Jun 2018	*	Dec 2020
Start LAW Cold Commissioning	Jun 2020	*	*	Dec 2022
Complete LAW Cold Commissioning	Nov 2020	*	*	*
CD-4a <sup>1</sup>	Apr 2021	Sep 2021	Aug 2023	*
Complete LAW Hot Commissioning	Jun 2021	Jan 2022	*	Dec 2023

\* Dates not specified in referenced document.

<sup>1</sup> The WTP Project defines CD-4a, “Approve Start of Initial Waste Treatment,” as the successful completion of cold commissioning, an operational readiness review, and approval to startup the LAW Facility consistent with DOE O 425.1D.





## WSU Students Tackle Hanford Challenges in Engineering Case Study



*“The students’ interaction with you helped them grow and mature tremendously. This is unquestionably among the most important elements in their education and development in becoming practicing engineers.”*

**- Marc Levin, Professor of Energy Production at Voiland School of Chemical Engineering and Bioengineering, WSU Pullman**





## Ongoing Partnership with Universities

ORP's lecture series is designed to educate faculty, students and the community on Hanford's mission and the exciting and meaningful careers needed to complete the mission.



Dr. Sahid Smith gives a talk on Hanford tanks to a group of WSU Tri-Cities students this spring.

DEPARTMENT OF ENERGY

LECTURE SERIES

# Lectures will continue in the Fall of 2017

*Live AMS broadcast has been scheduled in Pullman, Vancouver, Everett, and Spokane. To find the locations, please visit the AMS calendar at:*

***[ams.wsu.edu/RequestForm/EventsCalendar.aspx](http://ams.wsu.edu/RequestForm/EventsCalendar.aspx)***

FOR MORE INFORMATION  
Contact Tish Christman at  
**509-372-7683**

WASHINGTON STATE  
 UNIVERSITY  
TRI-CITIES





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

The Hanford Reach  
White Bluffs Overlooking the Columbia River

