



OFFICE OF
RIVER PROTECTION
United States Department of Energy

Hanford Advisory Board

Agency Update

for the

Office of River Protection

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

April 13, 2016



Our 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 2,054 employees*.

Bechtel National, Inc. (BNI)

BNI is responsible for the engineering, construction, startup and commissioning of the Waste Treatment and Immobilization Plant. BNI has 2,864 employees*.

Wastren Advantage, Inc. (WAI)

WAI is the prime contractor responsible for managing the 222-S Laboratory.



*As of July 2015







The Tank Farms

A 200 Area Aerial Overview

200 West Area

200 East Area

Retrieval efforts
at double-shell
tank AY-102

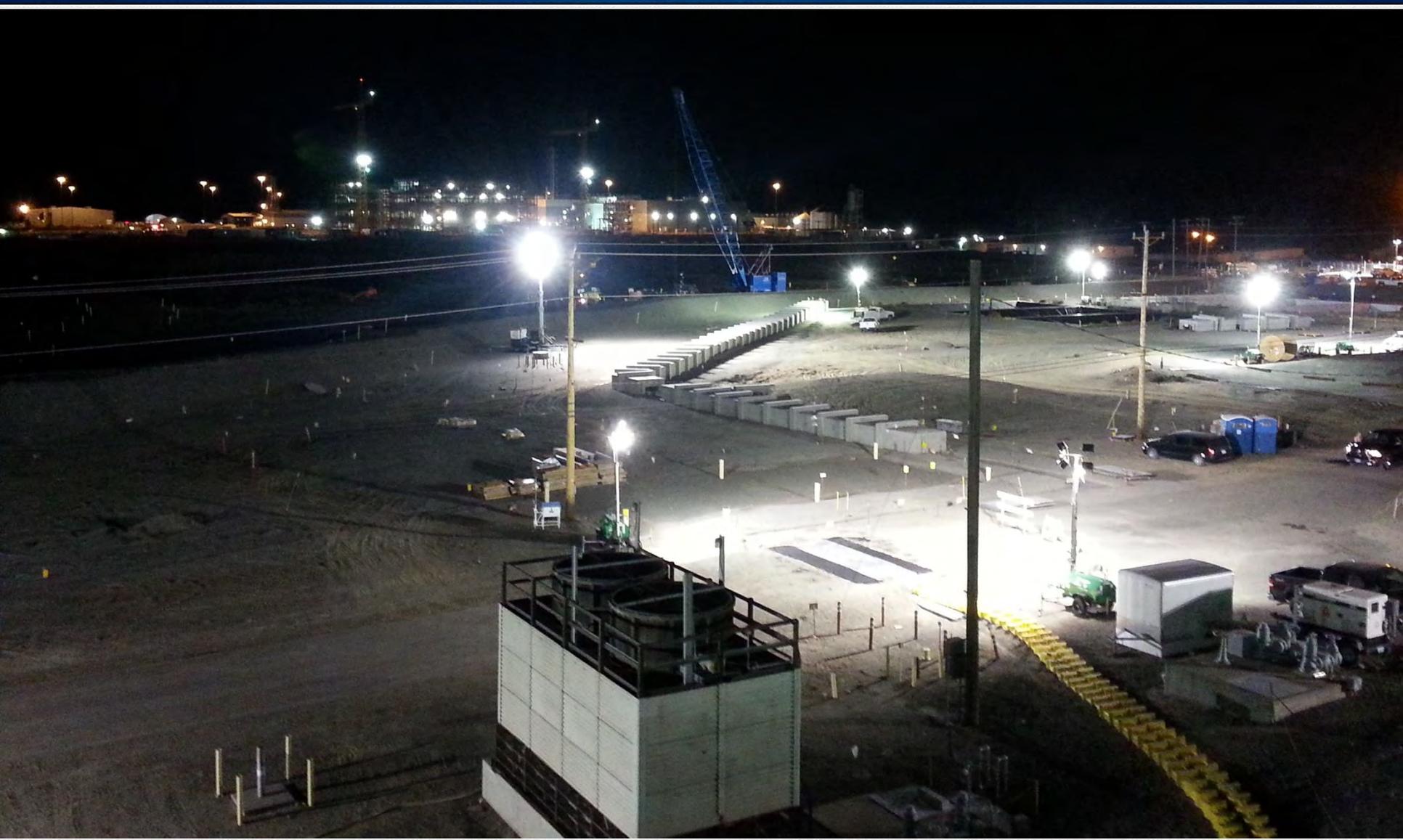
Tank Farm update

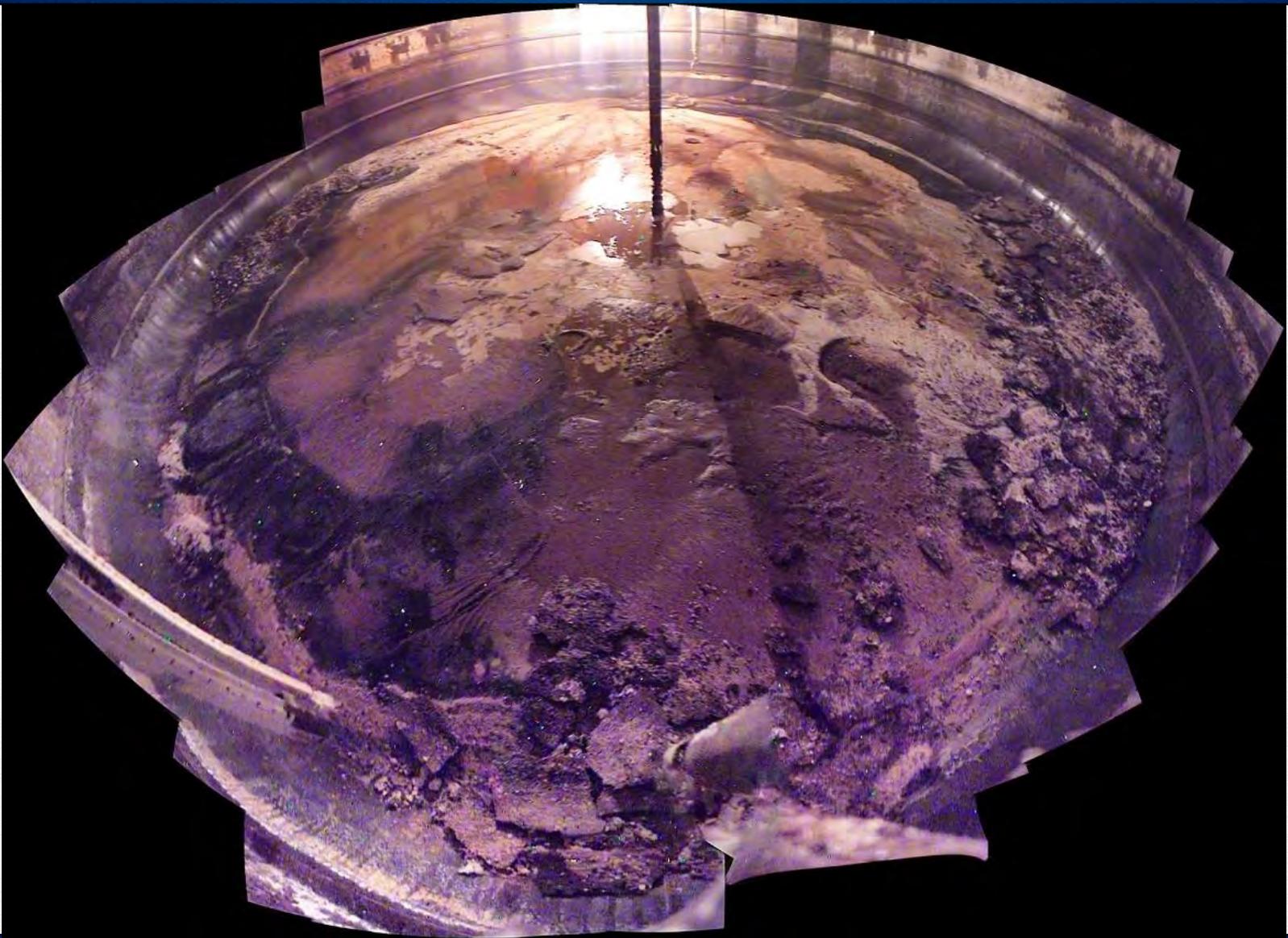
Future location of
Low-Activity Waste
Pretreatment System

Waste Treatment and
Immobilization Plant

- Single-Shell Tank Farm
- Double-Shell Tank Farm









(above) C Tank Farm with infrastructure built around the tanks to assist in retrieval activities.

(right) Field crews have started removing ancillary equipment from the tank dome at single shell tank C-105 to make room for new retrieval equipment.







Double-shell tank AY-102 retrieval update



(above) In-tank image of work being done in preparation for sludge waste retrieval



(right) Video displays of AY-102 retrieval operations

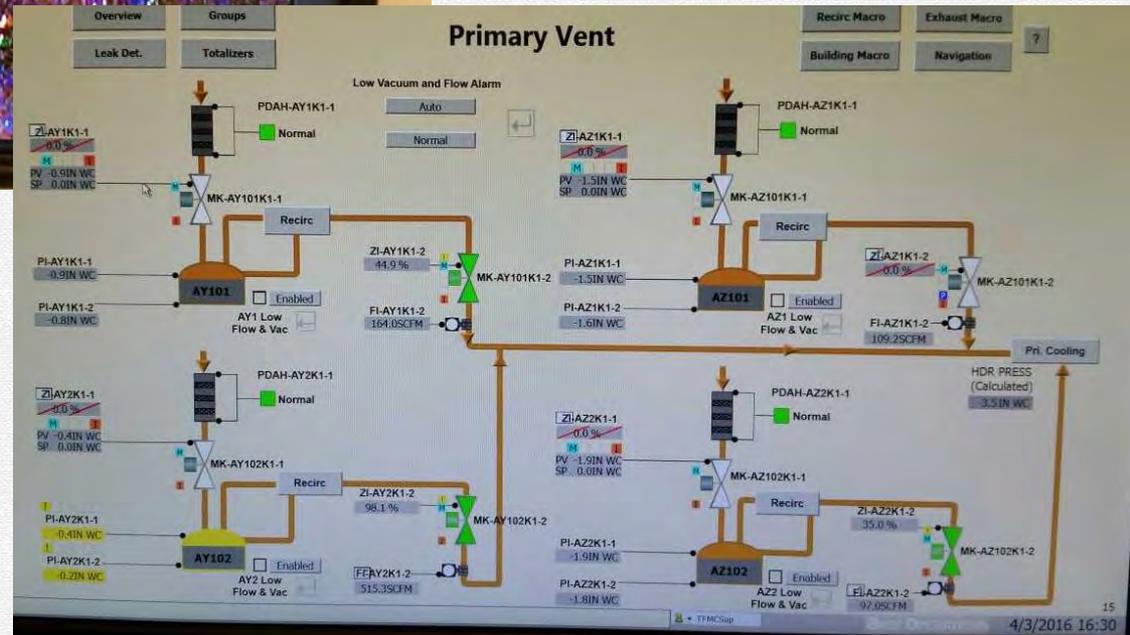


(far right) A tank farms worker pushes the button to initiate supernate transfer





(above) Video image of pump in AY-102. About 34% of sludge and 87% of total waste volume has been retrieved since operations began March 3



(right) Consistent flow rates have allowed for steady retrieval progress



A/AX double-shell tank farm



(above) An aerial view of A/AX tank farms

(right) Tank farms workers install riser extensions
on tank AW-104





Waste Treatment and Immobilization Plant (WTP)





(above) LAW melter lid "flip"

(above left) Thermal Catalytic Oxidizer

(left) Ammonia Dilution Skid



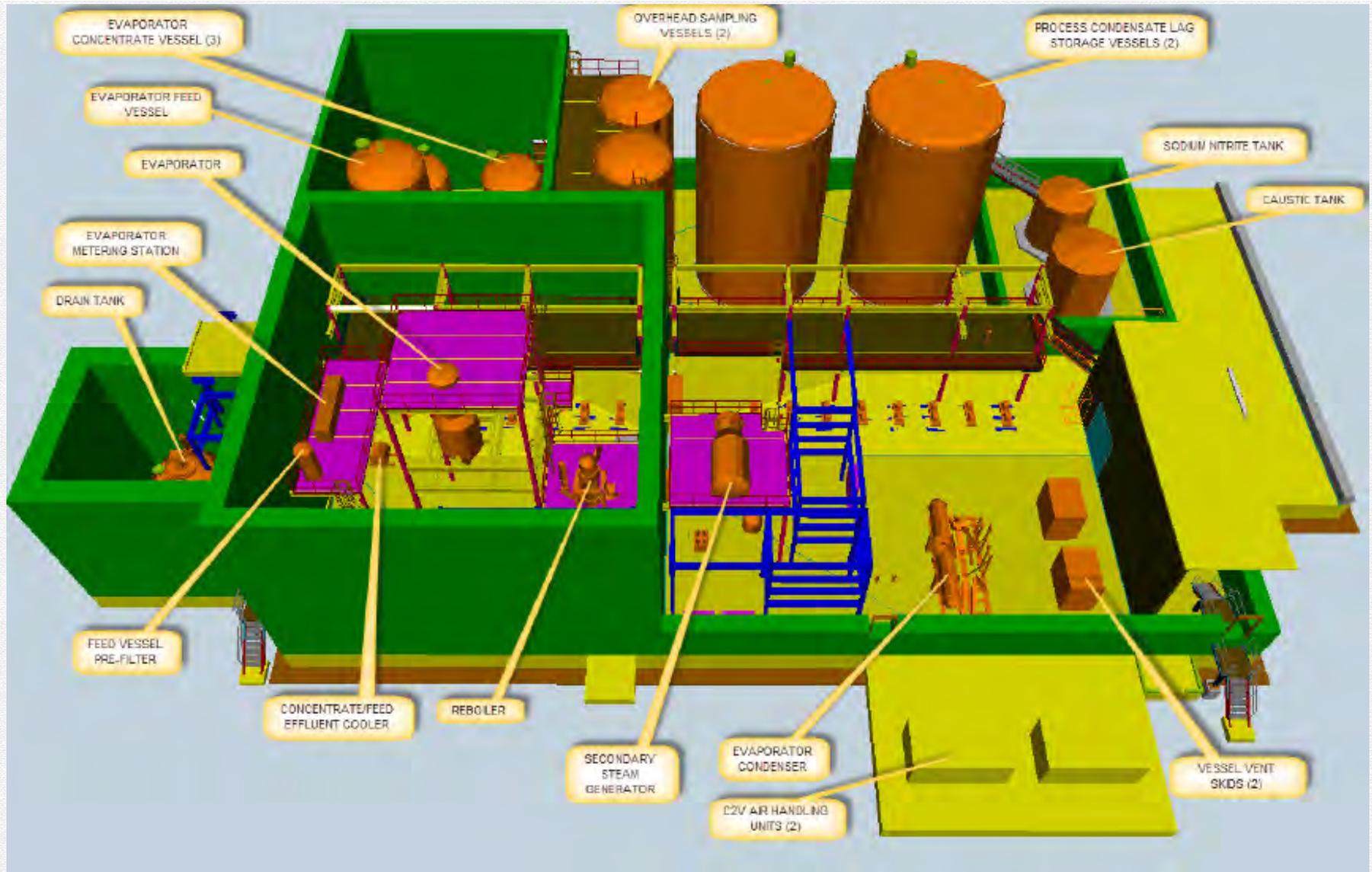


Effluent Management Facility Mud Mat Placement





Effluent Management Facility





T1 Hydrogen Gas Events in Vessels

- Risk of combustion in the vessel headspace due to hydrogen accumulation
- Develop operational strategy to prevent/mitigate hydrogen event

T2 Criticality in Pulse-Jet Mixer (PJM) Vessels

- 16 tanks may contain plutonium particles of size and density prone to settling
- Resolve criticality issues in high solids vessels through analysis and testing

T3 Hydrogen in Piping and Ancillary Vessels

- Concern over a deflagration event occurring in piping and ancillary vessels
- Develop piping design guide to mitigate and complete conceptual design for vessels based on quantitative risk assessment process

T4 PJM Vessel Mixing and Control

- Concern with adequacy of pulse-jet mixer (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 (black cell areas within Pretreatment [PT] Facility)

T7 Black Cell Vessel/ Equipment Structural Integrity

- Seismic ground motion criteria changed around 2005
- Complete structural analysis of standard vessel and strategy for structural upgrades to installed vessels

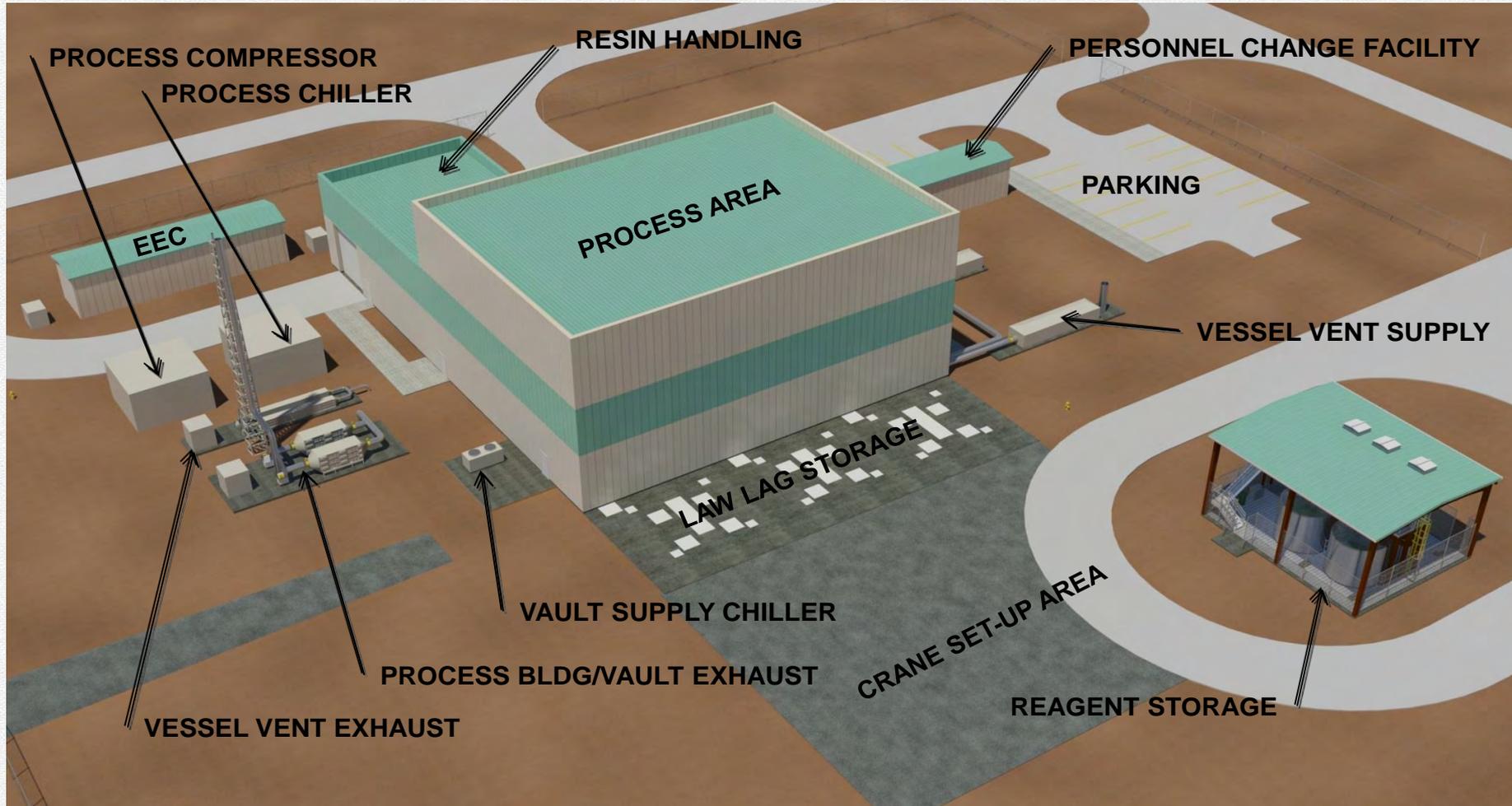
T8 Facility Ventilation/Process Off-Gas Treatment

- Multiple technical challenges associated with ventilation system, including HEPA filters
- Complete engineering/nuclear safety assessments to ensure ventilation meets requirements





Low Activity Waste Pretreatment System (LAWPS)



LAWPS completed its 30% design review and preparing for integrated testing (TRL6)





Direct-Feed Low-Activity Waste



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

