

HANFORD SITE

“I am proud of the many important achievements that our Hanford team has safely delivered during challenging times. I am optimistic about our site’s future, given what we have accomplished over the last few years, and especially this last year as we have prepared to start treating waste from our large underground tanks in the Direct-Feed Low-Activity Waste program. That next chapter of Hanford cleanup begins in 2022, when we start up our Tank-Side Cesium Removal System to produce a supply of waste that will be fed directly to our vitrification facility starting in 2023. Beyond the DFLAW program, our team continued to deliver taxpayer value in 2021 by safely progressing projects and conducting operations that reduce risks to our workforce, our community, and the environment of the Pacific Northwest.”

– Brian Vance, Manager, Hanford Site

HIGHLIGHTS

- Completed construction and startup testing of all Waste Treatment and Immobilization Plant (WTP) facilities needed to start immobilizing tank waste in glass using vitrification.
- Continued commissioning major vitrification plant systems associated with the Low-Activity Waste (LAW) Facility, including a loss-of-power test, a critical step toward heatup of the plant’s melters.
- Connected Hanford tank farms and the LAW Facility with waste transfer piping.
- Completed building and testing the Tank-Side Cesium Removal (TSCR) system that will start treating tank waste in 2022 to build up a supply to feed directly to the vitrification facility in 2023 – an EM 2021 priority.
- Completed stabilizing three at-risk underground waste disposal structures – an EM 2021 priority.
- Treated more than 2 billion gallons of contaminated groundwater for the seventh consecutive year.
- Initiated work with Network of National Laboratories for Environmental Management and Stewardship (NNLEMS) to develop an EM Research and Development (R&D) Roadmap for accelerating the Hanford tank waste cleanup mission.

PREPARING FOR TRANSFORMATIONAL TANK WASTE TREATMENT ERA

In 2021, the Hanford Site made significant progress on preparing the entire site for 24/7 operations to treat radioactive and chemical waste from large underground tanks using vitrification, or immobilization in glass. The Direct-Feed Low-Activity Waste (DFLAW) program involves a set of interdependent projects and infrastructure improvements operating together to successfully treat and dispose of millions of gallons of low-activity tank waste.

The year began with the Department and its contractors making headlines throughout the U.S. that workers had finished constructing all WTP facilities needed for DFLAW. Over the summer, when the Department, state and contractor officials announced workers had made the 3,500-foot waste transfer line connection between Hanford tanks and the vitrification facility, regional editorial boards praised the accomplishment and other work, and recognized that Hanford took a huge step forward in its tank waste treatment mission.



Commissioning of the DFLAW Program facilities took a giant leap forward in November, when the WTP completed startup testing of all systems needed to transform low-activity tank waste into a safe form for disposal.

Plant startup and commissioning activities reached a peak in November when the power was shut off to test backup systems, a critical step toward heatup of the plant’s two large vitrification melters. The melters will be heated up in 2022 using a mixture of chemicals, called glass frit, that mimics Hanford tank waste.



Following installation near the AP Tank Farm and rigorous testing, the TSCR is ready to start treating tank waste in 2022 to build up a large supply of liquids that can be fed directly to the nearby vitrification facility beginning in 2023.

Also in the fall, the DFLAW program took another giant stride forward when workers finished building and testing the TSCR system, completing one of EM’s top priorities for 2021. In 2022, the system will start treating tank waste to remove radioactive cesium and solids to build up a supply of waste that is ready to be fed directly to the LAW Facility for vitrification beginning in 2023.

PRIORITIZING RISK REDUCTION, SAFETY, AND SECURITY

Hanford teams also advanced several important risk-reduction projects in the past year. Workers finished stabilizing three underground waste disposal structures considered at risk, achieving another EM key priority for 2021. Workers began preparing the foundation for construction of a weather-resistant structure that will cover the K East Reactor until radioactive material in the core has decayed to levels safe for demolition. K East is the seventh of eight former plutonium production reactors that will be placed in interim safe storage, or “cocooned,” with Hanford’s ninth reactor preserved as part of the Manhattan Project National Park. In September, the site announced more than 2 billion gallons of groundwater had



For the seventh year in a row, the Department met its annual goal of treating more than 2 billion gallons of groundwater to remove contamination, in facilities like this one, in the 200 West Area of the Hanford Site.

been treated for the seventh year in a row. This brings the total to nearly 28 billion gallons treated since facilities began removing contamination from groundwater in the mid-1990s as part of overarching efforts to safeguard the Columbia River.

ENSURING FUTURE SUCCESS

Infrastructure projects, facility upgrades, permitting and construction all continued to support safe and efficient operations and preparations for treating tank waste. In October, workers started building a new water treatment facility that will handle the increased demand when tank waste treatment gets underway in 2023. Further setting the course for future cleanup successes at Hanford, major transitions were completed for the Hanford Mission Essential Services, Central Plateau Cleanup and 222-S Laboratory contracts. The Plateau contract represents the first implementation of EM’s end-state contracting model, which is designed to accelerate progress of cleanup activities.