Hanford Communities

Spring/Summer 2019 Newsletter

Richland • West Richland • Kennewick • Pasco • Franklin County • Benton County • Port of Benton

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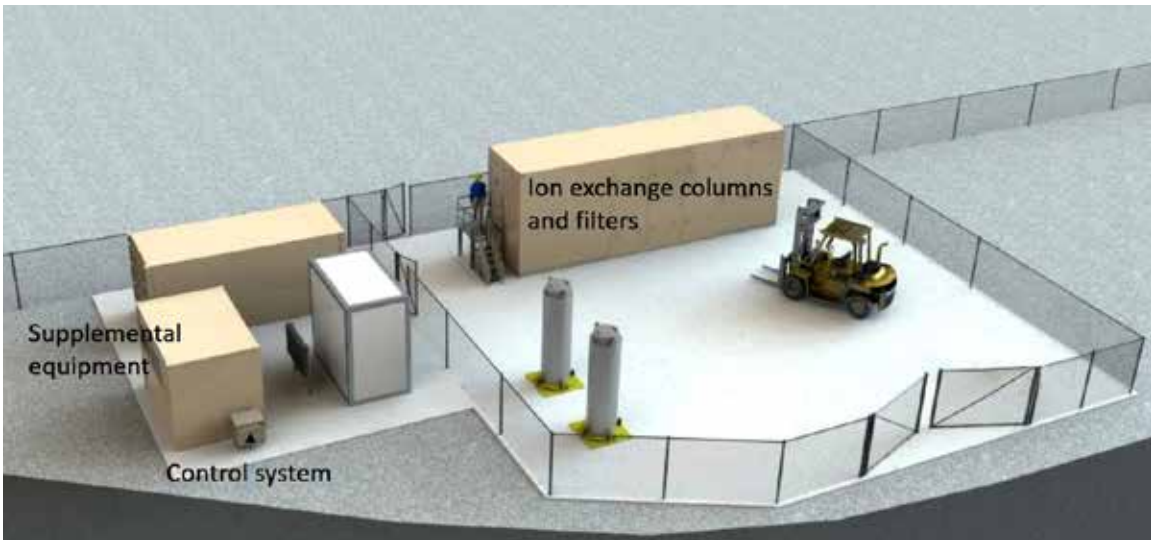
In This Issue

This Page

Inside

Speakers' Bureau

If you would like to have a member of the Hanford Communities Speakers' Bureau address your organization, please call (509) 942-7348.



This mockup shows the components of the tank side cesium removal process DOE is using to treat waste in the tank farms before piping it to the Waste Treatment and Immobilization Plant.

ORP Moves Forward with Tank Side Cesium Removal

The U.S. Department of Energy Office of River Protection (DOE-ORP) is moving forward with a plan to remove cesium and solids from tank waste before vitrification of low-activity waste (LAW). Using an ion exchange process coupled with filtration, workers can treat waste within the tank farms before piping it to the Waste Treatment and Immobilization Plant (WTP). The effort is based on a September 2017 external technical review of previous plans to develop a LAW feed and follows a small test case.

The effort consists of two phases. In the first phase, ORP will process an estimated 170,000 gallons of waste, removing as much as 100,000 curies of radioactive cesium from the double-shell tanks. This phase will allow an evaluation of how well the process works. It will also provide an initial feedstock to allow hot commissioning of the LAW Treatment Facility at the WTP by December 2021. The second phase may consist of a much larger volume of waste, which will allow engineers to optimize the process.

The treatment approach has three main components: the ion exchange columns and filters housed in an enclosure, the control system, and supplemental support equipment. Workers will install the components first in the AP tank farm, along with a number of transfer lines running to the WTP. The design for all components was 90% complete as of the middle of May.

"This is a 'first feeds' effort until DOE can conduct an alternatives analysis to determine a long-term feed solution," said Sahid Smith, federal project director for DOE-ORP. "We are currently running technology maturation tests. We wanted to have a good level of confidence going forward regarding the performance of the approach."

While the approach is simpler than those evaluated in the past, a number of hurdles must be overcome before full implementation. DOE-ORP needs to know how to extract the ion exchange media from the columns, what to do with the canisters once the cesium has been removed from the waste, and whether transfer lines will need replacing sooner than expected. Also needed is a contingency plan should the approach not prove as viable as expected. ■

Meetings

June 12
Hanford Regional Dialogue
5:30pm Open House
6:00pm to 8:30pm Meeting
Hanford Regional Dialogue
Best Western Plus, Richland

June 13 and 14
Hanford Advisory Board Meeting
8:30am to 5:30pm
Red Lion, Richland
Contact Kristen Holmes
(509) 376-5803

September 18 and 19
Hanford Advisory Board Meeting
8:30am to 5:30pm
Best Western Plus, Richland
Contact Kristen Holmes
(509) 376-5803

Single-Shell Tank Structural Integrity Deemed "Good"

The structural integrity of Hanford's 149 underground single-shell waste tanks was recently assessed by an independent qualified registered professional engineer, who deemed the integrity "good." The structural integrity review doesn't evaluate the inner carbon steel liner; it evaluates the concrete and rebar on the outside of the tanks.

DOE-ORP and Washington River Protection Solutions (WRPS) continue to monitor these aging tanks in 12 farms for waste level changes, leaks, and structural integrity. The tanks were built between 1943 and 1964 and range in size from 55,000 gallons to 1 million gallons. To determine the appropriate approach and frequency of monitoring, WRPS considers the type of construction, the types of wastes, and the different processes used to produce the waste.

"The structural integrity assessment is one part of the overall program to assure continued, long-term storage of waste in the single-shell tanks," said Jeffery Lyon, Tank Systems Operating and Closure Project Manager for the Washington State Department of Ecology's Nuclear Waste Program.

Other parts of the program include checking tank waste levels at least quarterly, waste sampling, visual inspections of the tanks at about 12 tanks per year, dome deflection surveys, and dome loading monitoring. Engineers look at waste chemistry, corrosion rates, storage histories, and changing conditions. For example, if rainwater is suspected of intruding in specific tanks, workers prioritize visual inspections for those tanks and monitor monthly rather than quarterly.

In addition, DOE continues to respond to recommendations from the Tank Integrity Expert Panel. Established in 2014, this blue-ribbon panel includes experts from other DOE sites, national laboratories, industry, and academia. Experts review information about the tanks and provide recommendations for increased safety and efficiency.

After the December 2018 structural integrity assessment, the professional engineer recommended that the assessment be repeated in 16 years. The Washington State Department of Ecology agrees with that recommendation and encouraged DOE-ORP to continue to look for new ways to improve monitoring technology in the meantime. ■

The external structure of Hanford's underground storage tanks, shown here during construction more than 50 years ago, was recently deemed "good" by an independent qualified registered professional engineer.

The Analytical Laboratory at the Waste Treatment and Immobilization Plant has transitioned to startup testing.

WTP Analytical Lab Now in Startup and Testing

Workers at Hanford's WTP have completed turnover of the Analytical Laboratory systems to the full startup testing phase.

"The laboratory is the first major WTP facility to complete systems turnover work," said Tom Fletcher, WTP project director for the DOE-ORP. "Finishing major construction and turning the laboratory systems over to the startup phase moves us closer to treating radioactive tank waste."

The turnover comes after WTP contractor Bechtel National Inc. (BNI) successfully energized the laboratory's lights, panels, and outlets this past fall. Engineers tested 34 systems, including electrical, mechanical, heating, ventilation, air conditioning, and high-purity gases systems. Startup testing will verify the laboratory equipment and systems are in safe and working order for handover to the commissioning phase. This testing is anticipated to finish in 2019.

The Washington State Department of Ecology contributed to this latest success by the providing the permitting required to allow construction. In addition, Ecology completed a Dangerous Waste Permit Application, which was needed to support startup activities for the Lab Operations.

The laboratory's key function is to confirm that all glass produced by the LAW facility meets regulatory requirements and standards. When that facility is operational, laboratory technicians will analyze approximately 3,000 process samples each year. Analyses will confirm the correct combination of chemicals to produce a consistent glass form. Workers will also take samples throughout the vitrification process to confirm a high-quality glass product and good process controls.

"This accomplishment involved many people and teams," said Valerie McCain, BNI principal vice president and WTP project director. "It represents the full range of work including design and engineering, environmental permitting, procurement, construction, and many support organizations."

As startup testing continues, WTP chemists are developing the processes needed to analyze radioactive tank waste, working at Columbia Basin College in Pasco. Ecology is currently conducting certification reviews to ensure that the Lab was built according to the permit. ■

MSA Develops New Approach to Hanford Site Revegetation

An environmental scientist mixes a unique blend of seeds to increase survival rates of native species in revegetated areas at Hanford.

As part of the Long-Term Stewardship Program at Hanford, DOE contractor Mission Support Alliance (MSA) is revegetating cleaned up land. Most of this land stretches along the Columbia River corridor. A new approach may help this revegetation thrive.

After areas are revegetated with native plants and shrubs, they are routinely monitored for at least five years to ensure the new vegetation continues to grow. Environmental scientists set goals for shrub density, native plant cover, and lack of invasive species. Unfortunately, monitoring in 2017 identified 140 acres where revegetated areas were not meeting these goals. Historically, if monitoring showed a location was failing, the contractor cleared the area and planted it again. Such repeated plantings didn't always work.

Taking into consideration the different landscapes, current plant life, and soil conditions, MSA environmental scientists determined a mixture of seeds that would increase survival rates of certain native species. They also used results from a Hanford Site pollinator study to create a specially formulated seed mix to encourage pollination and species diversity.

In more than half of the areas where revegetation wasn't thriving, MSA implemented supplemental planting (in lieu of full-scale revegetation) to save areas of successful growth. In some areas, they opted to plant flower plugs, which are small seedlings with a few inches of growth, soil, and a root structure. These plugs act as a seed source for the revegetated site.

"Using these new approaches will help to improve the sustainability of these habitats at Hanford," said Randall Krekel, DOE land management program manager.

The 2019 revegetation project was completed in March, and MSA will closely monitor the results over the next few years to determine success rates and help refine future efforts. ■

Hanford Communities
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