Hanford Communities

Fall 2017 Newsletter

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

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Speakers' Bureau

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

Corrective Actions Proposed for PUREX Tunnels

The U.S. Department of Energy (DOE) has proposed corrective actions for two tunnels near Hanford's Plutonium-Uranium Extraction (PUREX) Plant. On May 9, 2017, routine surveillance identified a partial collapse of the timber roof structure over one of two tunnels leading from the facility. The tunnels contain contaminated equipment and waste materials from Hanford's plutonium processing operations. The waste includes both radioactive elements and chemicals such as lead, cadmium, and barium.

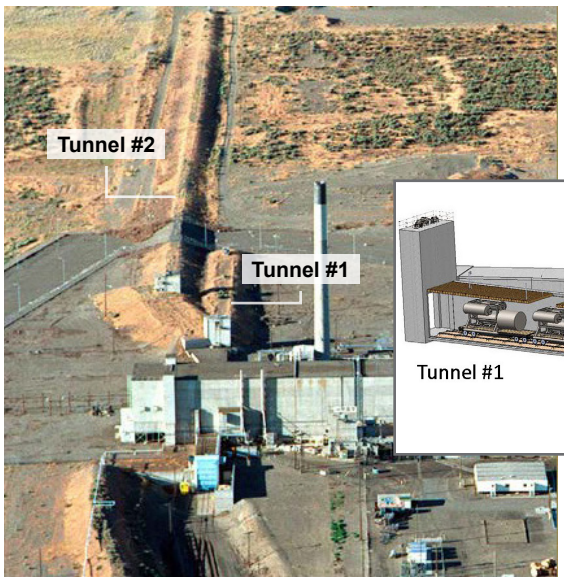
As the regulator for the portion of Hanford cleanup that encompasses PUREX and its tunnels, the Washington State Department of Ecology requested that DOE analyze the structures and provide a draft report by August 2 describing corrective actions to ensure safe storage of the waste in both tunnels.

Engineering evaluations of the waste tunnels by contractor CH2M HILL Plateau Remediation Company (CH2M) concluded that the two tunnels do not meet current structural codes and standards. DOE plans to fill Tunnel 1 with engineered grout, as approved by Ecology. The grout will stabilize the tunnel and enable future remediation of the equipment and materials stored inside. The approach reduces risks to workers and the environment compared to other possible stabilization approaches.

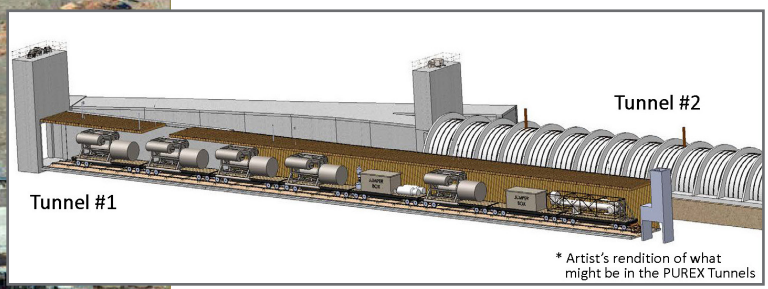
The evaluation of Tunnel 2 showed that the design may not be able to bear the weight of the soil above and represents a high potential for localized collapse. Tunnel 2 was built of metal and concrete in 1964 and is approximately 1,700 feet long with 28 rail cars stored inside. The waste on these rail cars is similar to the waste in Tunnel 1.

"We are evaluating options for using a remote capability to get a look at the general condition of the inside of the tunnel as well as to take radiological readings," said Doug Shoop, Manager, DOE Richland Operations Office, in a press release. "We have increased our monitoring of the tunnels, including daily walk-downs and cameras that overlook both tunnels."

DOE has convened a "Best and Brightest" panel to consider the tunnel design, operating history, and waste inventory; analyze options; and identify where more information is needed. The result will be a detailed alternative analysis for Tunnel 2, which DOE will discuss with the panel before selecting a response action for Tunnel 2. Enhanced surveillance and monitoring of Tunnel 2 will ensure safety until a further response action is selected and implemented. ■



DOE has proposed corrective actions at two PUREX tunnels after a partial collapse at one in May.



The two PUREX tunnels contain contaminated equipment and waste materials from Hanford's past plutonium processing operations.

Participants at the 2017 Manhattan Project National Historical Park conference toured the newly restored White Bluffs Bank at Hanford.

Hanford Communities Host Annual National Historical Park Conference

In August, the Hanford Communities and the Energy Communities Alliance hosted the fifth annual conference on the Development and Implementation of the Manhattan Project National Historical Park. The conference drew 60 participants from DOE; the National Parks Service (NPS); the communities of Oak Ridge, Tennessee, and Los Alamos, New Mexico; and the region.

The conference began with a full-day tour of the Hanford Site, highlighted by a stop at the White Bluffs Bank, which was built in 1907. Over the years, the building had deteriorated and, after the severe winter of 2017, was in danger of falling down. Fortunately, DOE in partnership with the NPS developed a plan to completely restore the building. Tour participants, particularly those from Hanford, were thrilled to see the restoration. They also had a rare opportunity to tour portions of T Canyon, still an operating facility. In the afternoon, the group had a chance to see active remediation going on across the site, with a brief stop to see the Waste Treatment Plant under construction.

The next day, the conference convened at the Richland Library. Kris Kirby, the NPS Superintendent of the park, discussed completion of the Foundation Document, which identifies the park's interpretive themes. Next steps involve developing plans for the interpretive displays, visitor access, collection, and staff as well as a park film. Participants also heard from Tracy Atkins, the DOE Office of Legacy Management lead for the park. Elected officials, DOE staff, and NPS managers from each community provided a report on activities in the last year.

Visit Tri-Cities President Kris Watkins presented a much-awaited "Branding Report." She and her counterparts in Oak Ridge and Los Alamos have been working for more than a year to come up with a marketing brand. It was their goal to capture a sense of history and intrigue, open the door to stories within the context of science, communicate the legacy of the Manhattan Project, and entice visitation. Everyone was very excited about what they have developed. The brand will be released in the next year.

Jeff Reinbold, the NPS Assistant Director for Partnerships and Civic Engagement, discussed NPS Partnership Agreements, which will provide local communities the opportunity to work with NPS on plans for park development and authorize them to undertake fundraising activities. He also shared ways to partner with local universities.

The conference ended with a Mid-Columbia Mastersingers concert at B Reactor. The concert is part of a program developed by the City of Richland City View staff and is available on YouTube at https://youtu.be/9Q3GIyHzPfA. ■

C-105, Last Tank in C-Farm, Begins Final Waste Removal

In August, DOE Office of River Protection (ORP) contractor Washington River Protection Services (WRPS) began removing waste from single-shell tank C-105, the last of sixteen tanks to be retrieved, setting the stage for eventual closure of the farm.

"A sincere thanks to all who have worked so hard to prepare us for this important job," said WRPS Retrievals Manager Doug Greenwell. "It took an entire team working around the clock in some cases, over nearly two years, to retrofit, test, and prepare to operate the retrieval system in C-105 to get us to this point."

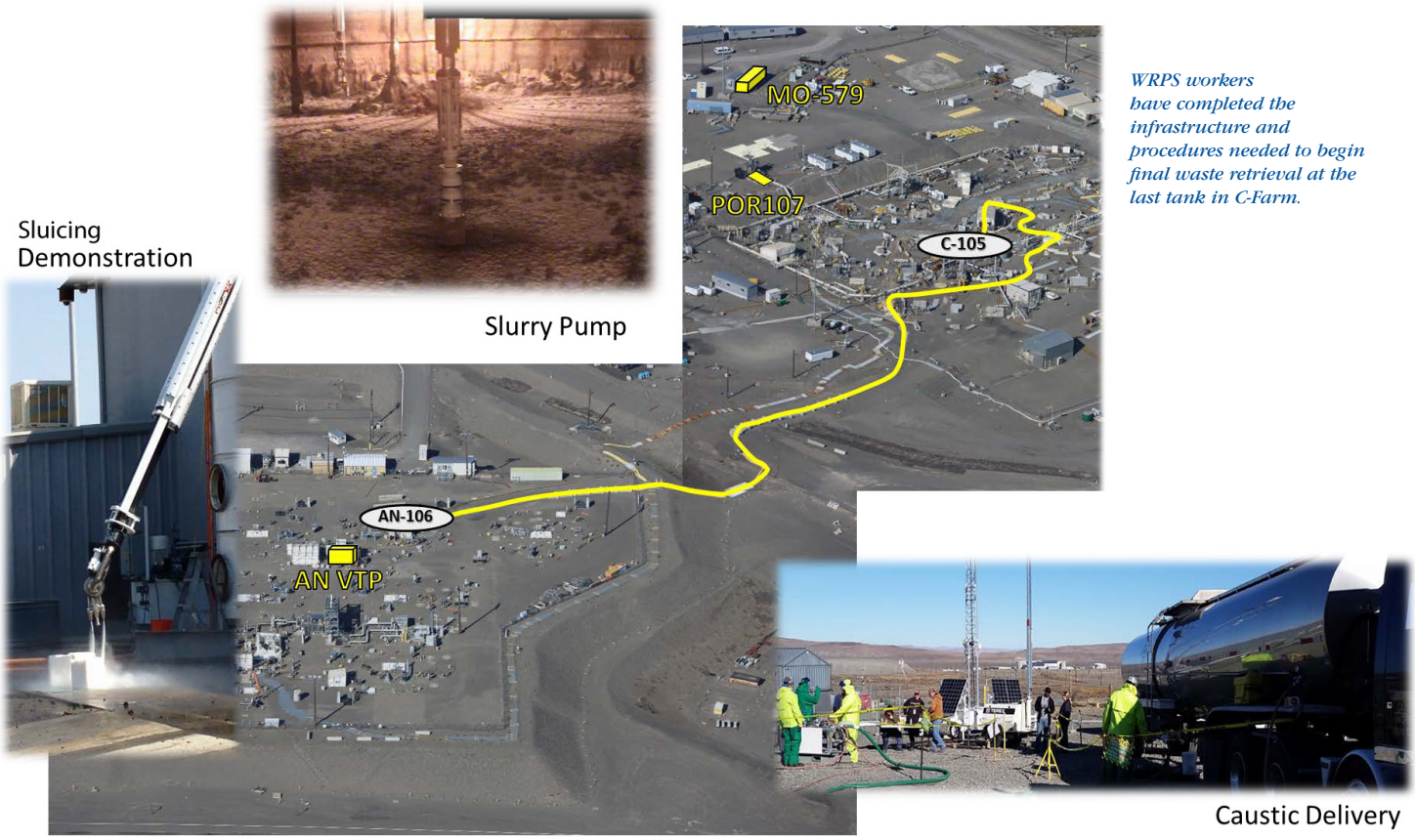
This final phase of retrieval will target the approximately 30,375 gallons of radioactive and chemical waste remaining in the tank. Since this final phase of retrieval started in August, operators have retrieved more than a third of the assumed volume remaining in the tank. The retrieval process will include sluicing with liquid waste from double-shell tank AN-106, sluicing with high-pressure water, hot water rinsing, and caustic dissolution. The hot water and highly caustic solutions are expected to soften and dissolve the waste, allowing hard-to-retrieve material to be transferred to AN Farm.

"The goal for the C-105 retrieval project is to meet the regulatory requirement of leaving no more than 360 cubic feet of waste in the tank," Greenwell said.

WRPS and Hanford Atomic Metal Trades Council worked together to develop controls to address chemical vapor concerns. Sampling includes ventilation-stack monitoring, industrial hygiene monitoring and sampling, and strategically placed air monitoring instruments. A mobile laboratory records and analyzes air samples from areas around the tank farms. The project team is also prepared for a possible leak, with a leak detection system in place.

Once retrieval activities are complete, as early as November 2017, WRPS will record an in-tank video of C-105, determine the final waste volume, and complete waste sampling. The contractor will compile a report summarizing retrieval activities and work with DOE and the Washington State Department of Ecology to evaluate next steps leading to closure of the tank. With C-105 completed, C-Farm will be the first tank farm to be retrieved.

"It's exciting to be nearing completion of retrieval in C Farm," said Glyn Trenchard, ORP Assistant Manager for Tank Farms. "These sixteen tanks have provided an excellent opportunity to test several different retrieval technologies and led to a number of lessons learned. We expect the knowledge and experience gained in C Farm to significantly improve efficiencies in our next retrieval efforts at A/AX Farms." ■



WRPS workers have completed the infrastructure and procedures needed to begin final waste retrieval at the last tank in C-Farm.

PFP Stack Demolished, Last Buildings Begin Demolition

In July 2017, workers safely removed the iconic 200-foot-high exhaust stack at the Plutonium Finishing Plant (PFP) on Hanford's Central Plateau. Video of the demolition can be seen at https://www.youtube.com/watch?v=KfVLxlIYJLI.

"The stack demolition is the result of years of preparation to clean out the contaminated facility to the point where the ventilation system isn't needed and can be demolished," said Tom Teynor, project director for PFP demolition at the DOE Richland Operations Office, in a press release. "Removing the stack is not only historic, but it allows workers in heavy equipment to more easily access and demolish the remaining portions of the facility."

Controlled Demolition, Inc., a CH2M subcontractor, used a small amount of explosives to weaken the stack, allowing gravity to bring it to the ground. The technique is considered safer and more efficient than having workers demolish the tall structure using cranes and other equipment often high above the ground.

Removal of the ventilation building and stack marks completion of two of the four main processing buildings that made up PFP. Workers continue efforts at the main processing facility, nicknamed "Z-Plant," because it was the last stop of plutonium production at Hanford. Operations from 1949 to 1989 at Z-Plant left the facility highly contaminated. Over the last 20 years, workers decontaminated and removed about 200 pieces of plutonium processing equipment such as glove boxes, 1.5 miles of ventilation piping, contaminated process lines, asbestos, and other hazards.

"As we've done since we started demolition, we remain focused on safety," said Kelly Wooley, CH2M deputy vice president of the PFP closure project. "A lot of people are accomplishing an amazing amount of work, causing the landscape to change every day. It's an exciting time to be at PFP."

Demolition will proceed from the outside toward the inside of the main processing facility, while another demolition team continues work on the Plutonium Reclamation Facility. Work at both facilities is expected to be completed by late this year or early next year. ■

Thanks to years of preparation, workers felled the PFP ventilation stack successfully in July.

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Speakers' Bureau

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Workers have nearly finished remediating the 618-10 Burial Ground just north of Richland and will soon turn their attentions to two nearby sites.

Completion in Sight for 618-10 Burial Ground Cleanup

After years of surprises and innovations, workers are nearing completion in remediating what was once believed to be one of Hanford's most hazardous waste sites, the 618-10 Burial Ground. The area included various waste items, 94 vertical-pipe units (VPUs), and 2,201 drums filled with hazardous waste generated in Hanford's 300 Area laboratories and fuel development facilities during plutonium production. In total, workers have removed more than 350,000 tons of low-level waste.

When remediation began in 2010, it quickly became clear that historical information about the burial ground was inaccurate. Trenches were not as defined as expected, requiring wider sampling and careful mapping. Workers were surprised by a number of unique waste forms, including an intact hot cell, pyrophoric drums that could burst into flame on contact with oxygen, and hundreds of glass bottles with small amounts of an unknown liquid inside. The frequent winds necessitated special procedures to ensure no dust would spread.

Workers from CH2M HILL Plateau Remediation Company (CH2M) completed remediation of the first 80 VPUs in February. The remaining 14 units, made of heavy-gauge steel and smaller in diameter, required a different method to remediate that exposed short segments of the pipes, which were then sheared off under a grout mixture. The team completed the removal of the last VPU, a 20-foot long steel pipe that was once buried, on May 8, 2017.

continued on back page

Meetings

September 6 and 7

Hanford Advisory Board Meeting

8:30am to 5:30pm
Best Western Hotel
1108 East Marina Way
Hood River, OR

Contact Kristen Holmes
(509) 376-5803

Stabilization and Ventilation Modifications Complete at WESF

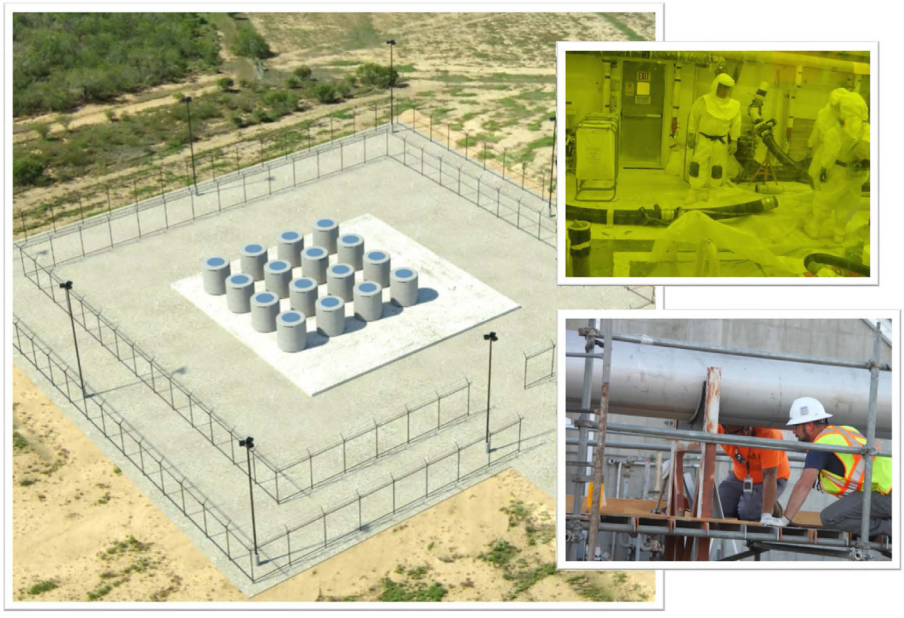
Recently, workers completed an effort to reduce risk at the Waste Encapsulation and Storage Facility (WESF), which stores 1,936 highly radioactive cesium and strontium capsules, representing a significant portion of the Hanford Site's radioactivity.

The facility remained operational during efforts to modify the its ventilation system and stabilize legacy contamination by grouting six hot cells and other components. Those improvements to WESF are necessary before transferring capsules to dry storage, which is safer and more efficient than the current underwater storage location. The capsules will be moved to dry storage once additional modifications are made to WESF and the new storage area is designed, permitted, and constructed.

Safely completing the grouting was a significant accomplishment, requiring the team to transition the innermost, highly contaminated section of an operating nuclear facility to a cold-and-dark configuration, and then weave grout lines throughout the facility, filling the hot cells, airlock, old duct work and filter pit with grout. Workers did it safely without disrupting the nearby capsules.

The cesium and strontium capsules were created in the 1970s, when the elements were removed from underground waste storage tanks at Hanford to reduce temperatures inside the tanks. Currently, the capsules hold 77 million curies, accounting for approximately one-third of the radioactivity at Hanford and generating a lot of heat. The water covering the capsules serves as insulation to protect workers from high levels of radioactivity and helps keep the capsules cool.

In November 2016, CH2M awarded NAC International the contract to design and fabricate a cask storage system for the capsules. This system includes the processes and associated equipment to retrieve, package, and transfer the capsules for extended storage in a capsule storage area, which is also being designed. ■



Workers are preparing the Waste Encapsulation and Storage Facility for transition of the cesium and strontium capsules stored there to dry storage, shown here in an artist's rendition.

Workers Prepare for Final K Basin Sludge Removal

The U.S. Department of Energy (DOE) and CH2M are steps closer to removing approximately 35 cubic yards of radioactive sludge stored less than 400 yards from the Columbia River in the K-West Reactor Basin. Recently crews entered the testing phase of the Sludge Treatment Project. This vital step, called K Basin Preoperational Acceptance Testing, is intended to prove the sludge removal equipment works as designed.

"We have gone from design to installation to acceptance testing of the equipment," said Ty Blackford, CH2M President and Chief Executive Officer, who shared progress with the Hanford Communities Governing Board in April. The project is currently ahead of schedule.

The sludge is a gray, silty substance created when irradiated reactor fuel rods stored in the basin began to deteriorate years ago after production activities stopped in the 1980s. Its unique consistency (silt-like, but with some constituents almost twice as dense as lead) and high levels of radioactivity make it difficult to remove. Workers overcame many technological challenges to make sure the equipment used to remove the sludge works as designed.

To facilitate removal, workers constructed a sludge transfer annex next to the basin. The annex will be used to transfer the sludge in containers to T-Plant, located at the center of the Hanford Site where it will be stored in cells in the interim. Moving the sludge to the center of the site will greatly reduce risks to the Columbia River. CH2M expects to begin removing sludge from the basin in January 2018. ■

Workers are testing equipment that will be used to remove radioactive sludge from the K-West basin, including building a new sludge transfer annex.

Hanford Advisory Board Loses Experienced Advocate

Richard I. Smith, long-time member of the Hanford Advisory Board (HAB), passed away recently. Born and raised in Kennewick, Smith was a graduate of Kennewick High, Washington State University, and UCLA. Smith worked for Battelle Pacific Northwest National Laboratory until his retirement in 1996, focusing on reactor physics, reactor decommissioning, and waste management. His expertise served him well as the representative for the City of Kennewick on the HAB, where he was an active member from 2003 to 2016.

"Dick's consistent support for the efforts of the HAB and wry observations made us pause and reconsider what we often took for granted," said Steve Hudson, former HAB Chair.

"Dick was a wonderful member of the HAB—a gentleman and a scholar whose contributions were invaluable," offered Susan Leckband, League of Women Voters representative and HAB Chair.

The Hanford Communities sends condolences to Dick's family and many friends. He will be missed. ■

Completion in Sight for 618-10 Burial Ground Cleanup, continued

"Completing these tasks is a truly amazing accomplishment, and we have a team of hard-working, highly experienced people at the 618-10 burial ground to thank for it," said Bryan Foley, DOE-RL federal project director for the burial ground cleanup.

"This achievement is the result of years of preparation," said Tammy Hobbes, vice president of the 618-10 project at CH2M. "We are near the end of this remediation project, and we are proud of the teamwork and safe progress made."

Workers are now removing the remaining contaminated soil in a mass excavation effort that will be followed by verification sampling to make sure cleanup levels have been achieved. They will then backfill the excavated site before moving on to two adjacent waste sites. The 316-4 Waste Site is a uranium-contaminated site. Waste retrieval there is expected to be completed by the end of June 2017. The 600-63 Waste Site is scheduled for completion approximately one month later.

For more on progress, see the video online at https://youtu.be/CC8hVvXv63I. ■

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Contract Modifications Could Allow Tank Waste Treatment as Soon as 2022

On December 16, 2016, the U.S. Department of Energy (DOE) announced modifications to the baseline and contract for the Hanford Waste Treatment and Immobilization Plant (WTP). The modifications will lead to low-activity waste (LAW) being treated as soon as 2022, years ahead of the previous baseline.

Originally, treatment of all types of tank waste was to start at the same time. In January 2014, based on a number of studies and input from the Hanford Advisory Board, DOE directed Bechtel National, Inc., the WTP contractor, to look at a different approach that would sequence treatment by waste type. Sequencing allows LAW treatment to start as soon as 2022 while the facilities for the treatment of high-level waste continue to be built and commissioned. Construction of the LAW Facility is scheduled for completion in 2018.

The contract modifications cover completion of the Analytical Laboratory, a group of 22 support facilities and systems known as Balance of Facilities, new capabilities to allow direct feed of LAW, cold and hot commissioning of the LAW Facility, and project services. These changes along with a contingency fund and other federal project funding requirements raise the construction cost of the WTP by approximately $4.5 billion to a total of $16.8 billion.

The revised contract also includes incentives for Bechtel to complete the Analytical Laboratory, LAW Facility, and Balance of Facilities by specific dates and to share in cost savings for completing work early. If Bechtel fails to meet the agreed upon schedule, DOE may reduce the contractor's fee.

"DOE is committed to addressing the environmental legacy of decades of nuclear weapons production activities at the Hanford Site in a safe and cost-effective manner," said Kevin Smith, Manager of the DOE Office of River Protection, which oversees the WTP Project. "We are confident that the modified contract and baseline represents the most effective and expeditious path toward beginning tank waste treatment at Hanford as soon as practicable." ■

Construction of the LAW Facility is scheduled for completion in 2018, with waste treatment as early as 2022.

Meetings

March 1 & 2
Hanford Advisory Board Meeting
8:30am to 5:30pm
Richland Red Lion

Contact Kristen Skopeck
(509) 376-5803

An aerial view of PFP shows a snowy and partially-demolished fourth floor of the Plutonium Reclamation Facility.

Demolition Well Underway at PFP

Heavy equipment is demolishing a building nicknamed after the man who received the highest ever recorded dose of radiation at the Hanford Site. Cleanup contractor CH2M HILL Plateau Remediation Company (CH2M) recently began demolishing the Americium Recovery Facility, also known as the "McCluskey Room." The Americium Recovery Facility is the second of four major buildings to undergo demolition at the Plutonium Finishing Plant (PFP).

"Demolition is progressing safely, deliberately, and well," said Tom Teynor, project director of the DOE PFP Closure Division. "Starting demolition of the Americium Recovery Facility brings another chapter of Hanford history to an end and represents a significant hazard reduction on the site."

During plutonium production at the plant, the Americium Recovery Facility separated radioactive americium for other uses. The facility was nicknamed the "McCluskey Room" by workers after a chemical reaction and explosion inside processing equipment occurred in 1976. Harold McCluskey was working in the facility at the time and was seriously injured. He received a dose of radioactive americium that was 500 times the amount deemed safe. McCluskey died 11 years later of unrelated causes.

The facility never resumed operations after the 1976 incident. At one point the doors were welded shut, and the facility has been entered few times since the incident. In 2014, CH2M crews began final demolition preparations in the room. By early 2016, the remaining contaminated pieces of processing equipment were removed from the room. Other items, like chemical tanks, were prepared for removal from the building during demolition.

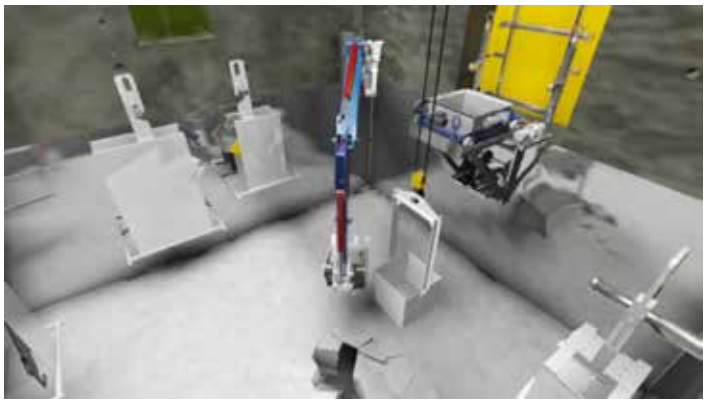
"The PFP team has done a tremendous job safely performing this hazardous work – whether it's cleaning out the buildings or demolishing them," said Tom Bratvold, vice president of the PFP closure project at CH2M. "We are making steady progress, and we will continue to do so safely."

CH2M employees began demolition of the Plutonium Finishing Plant complex in November 2016 by starting demolition of the Plutonium Reclamation Facility. That facility is approximately one-third demolished at this point. Demolition of both buildings is expected to be complete by March 2017. Demolition will then progress to the main PFP processing facility and finally to the facility's ventilation building and stack. Demolition of the entire PFP complex is scheduled to be completed by September 2017.

An online video shows the demolition in progress in late December 2016: https://www.youtube.com/watch?v=ojtyaygW6vk ■

Remaining Hazard Being Removed from Hanford's 300 Area

This mock-up will provide full-scale training for employees on the use of remotely operated tools for soil removal.



This conceptual illustration shows the remote-operated excavator and load-out mechanism to remove contaminated soil from beneath Building 324.

Within view of the Columbia River and just north of the Richland city limits sits a hazardous remnant of the Cold War. Building 324 served as a research and development facility, where employees conducted studies on highly radioactive materials. It is one of the few remaining buildings in Hanford's 300 Area; more than 170 others were demolished over the last decade.

DOE contractor CH2M is responsible for the safe and compliant management of the building and for removing the highly radioactive soil beneath the building to allow for eventual demolition. The contaminated soil was discovered during demolition preparations in 2010. The soil contamination came from a spill in the late 1980s inside one of the building's hot cells, which are heavily contaminated from years of experiments.

"We are continuing to make progress toward cleaning up the waste site under the 324 Building, which is where we face most of the risk and where we'll focus our first efforts," said Mark French, project director of the DOE River Corridor Division.

Because the soil is so contaminated that exposure to it would be lethal within two minutes, employees will use remotely operated equipment to remove the debris left inside the hot cell, remove the floor of the hot cell, remove the most highly contaminated soil beneath the hot cell, and package it all for disposal.

"Removing the contaminated soil from under the building is a top priority for our local elected officials," said Pam Larsen, Executive Director of the Hanford Communities.

CH2M is designing and testing the equipment, engineering the structural support required to maintain the building's integrity during soil removal, and preparing to clean out the airlock and hot cells in 2017.

CH2M will use three specialized mock-ups of the building's hot cell area to allow crews to test and train on the remote equipment. This approach improves safety because it allows work in an environment free of chemical and radiological hazards. A mock-up such as this is also more efficient because troubleshooting can be performed in a non-contaminated setting to aid in developing solutions to issues that may develop during operations. If equipment is deployed in a contaminated environment, it sometimes cannot be retrieved for further testing or refinement.

CH2M assumed responsibility for the Building 324 scope in 2016 as the remaining River Corridor Closure Contract work transferred from Washington Closure Hanford to CH2M. Many of the previous employees became CH2M employees, and the project, including the soil removal team, benefit from the continuity in staff from the transition as well as the redeployment of experienced resources from other Hanford work.

"This is a complicated and hazardous project," said Bill Kirby, vice president of CH2M's Building 324 Disposition Project. "We have the right team and the right talent to complete soil removal safely and compliantly – significantly reducing risk to the Hanford Site and community." ■

Pumping Resumes on Tank AY-102

Despite challenging winter weather, pumping has resumed on Tank AY-102 to empty it of its waste. The tank, which began operating in 1970, is the oldest of Hanford's double-shell tanks. Routine monitoring in late 2012 led to the discovery of a small leak. High-level radioactive waste had leaked from the tank's inner shell into the annulus, the space between the inner and outer shells. There is no indication that waste has leaked outside the tank to the environment.

The tank once held 800,000 gallons of waste. Workers have removed most of it by sluicing then spraying with high-pressure water. The remaining 5% comprises approximately 23,000 gallons, including 3,000 gallons of supernate (liquid) added during retrieval operations. Workers will be using extended-reach sluicer technology to complete waste retrieval by March 4, 2017. That deadline is spelled out in a Settlement Agreement with Washington State. Once retrieval is complete, workers will attempt to investigate the source of the leak before a decision is reached on final tank closure.

Washington River Protection Solutions (WRPS), the contractor managing the underground tanks, has been preparing for this final phase of waste retrieval. WRPS erected a full-scale mockup of the AY-102 primary tank at the Cold Test Facility to train operators. Engineers factored the highly congested work space, restrictive personnel protective equipment, and winter weather into plans. When temperatures drop below required thresholds to operate the retrieval system, work halts.

Industrial hygienists are monitoring for exposure to ammonia, volatile organic chemicals, and mercury. Results so far have been well below action limits that protect workers.

To keep workers and other stakeholders abreast of pumping and potential vapor exposures, WRPS has set up a new website: http://hanfordvapors.com/. WRPS updates the site at least weekly and as conditions change. ■

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