



U.S. DEPARTMENT OF
ENERGY | OFFICE OF
ENVIRONMENTAL
MANAGEMENT

Year in Review



2017 YEAR IN REVIEW

"It is a priority of this Department to address our cleanup responsibilities in a smart way that reduces risks, advances critical national security and science missions, protects the environment and achieves good value for American taxpayers. My visits to EM sites this year showcased steady and effective cleanup progress and provided a glimpse at the nuclear workforce of tomorrow." – Rick Perry, Secretary of Energy

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Secretary of Energy Rick Perry and Nuclear Waste Partnership Underground Operations Manager, Mark Percy discuss how waste is emplaced in the WIPP underground during the Secretary's May 11th visit.

DOE Environmental Management - Headquarters

Bringing Urgency to the Cleanup Mission

In 2017, the Office of Environmental Management (EM) made some significant accomplishments across the entire complex. At the Waste Isolation Pilot Plant (WIPP) which reopened early this year, we resumed waste emplacement and received the 12,000th shipment to date of transuranic (TRU) waste for safe permanent disposal. At Los Alamos National Laboratory, workers safely and successfully completed treatment of a set of remediated nitrate salt drums - one of the most dangerous waste streams in EM - to prepare them for disposal at WIPP. Idaho workers completed a near 15-year effort to retrieve ~65,000 m³ of TRU waste at the Advanced Mixed Waste Treatment Project. Oak Ridge broke ground on the Mercury Treatment Facility, which will enable EM to carry out additional cleanup activities at the Y-12 National Security Complex. At Savannah River we completed the construction of the 33 million-gallon Saltstone Disposal Unit 6.

EM also completed the long awaited Greater-Than-Class C (GTCC) low-level radioactive waste (LLW) and GTCC-like waste Report to Congress which puts the Department one step closer to having a GTCC LLW disposal capability. We also successfully transported hazardous materials more than 1.8 million miles with no Department of Transportation recordable packaging or transportation incidents.

The Project Management Institute (PMI) recognized EM's track record of success. At Hanford, PMI recognized the AY-102 tank recovery effort as its international project of the year after the site completed work ahead of schedule and \$8.7 million under budget. PMI also recognized the Savannah River Site's successful eighth underground liquid tank waste closure.

EM has ushered in a greater sense of urgency to its decision-making process to best position cleanup sites to build upon this proven record of results. The focus on timely decision-making enables EM to maximize the most promising opportunities to enhance safety, shorten schedules, increase transparency and reduce costs – achieving the best value for cleanup communities and all American taxpayers.

Timely Decisions Leading to Success

The focus on more efficient decision-making has resulted in complex-wide improvements. This approach has served as a catalyst for progress at EM sites, leading to more opportunities to reduce the greatest amount of risk possible with the resources available. The benefits will only increase as EM finalizes more decisions.

The advantages are perhaps nowhere more evident than at the Separations Process Research Unit (SPRU) in New York State. Workers there removed the tent enclosure at Building H2, which supported chemical separation of plutonium during the Cold War, after a decision was made that the underlying structure could be safely demolished without it. That decision helped to increase efficiency and momentum.

The new practice enhances the management and rigor of EM's operational efforts, including facility operations, environmental remediation and waste management and facility decommissioning and deactivation activities. Efforts are underway to cut acquisition times for major procurements to boost efficiency and achieve cost-savings. Work to streamline regulations continues. Taken together, these initiatives translate into getting more done to meet the federal government's defense waste cleanup responsibilities – now and into the future.



A worker practices the treatment method for remediated nitrate salts at Los Alamos National Laboratory



Building H2 beneath the tent enclosure at the Separations Process Research Unit



Elizabeth Wyatt, Mechanical Engineer and Senior Technical Advisor for Fluor Paducah Deactivation Project, helps Ballard County Middle School students understand groundwater and water sampling.



GEM Tech President Michael Evans, UCOR President Ken Rueter, U.S. Representative Chuck Fleischmann, Deputy Energy Secretary Dan Brouillette, U.S. Senator Lamar Alexander, Tennessee Deputy Governor Jim Henry, Oak Ridge Office of Environmental Management Manager, Jay Mullis, and Principal Deputy Assistant Secretary for Environmental Management Jim Owendoff break ground on a new Mercury Treatment Facility at the Y-12 National Security Complex in Oak Ridge, Tennessee

Growing Jobs and the Next Generation Workforce

EM work is carried out by the best of American businesses that are securing nuclear materials, reducing risks, and creating economic opportunities in communities across the nation. With more than 90 percent of EM's budget contracted out to private industry, this work directly employs more than 25,000 Americans and results in broader opportunities for job growth. Looking to small businesses to advance its mission and support economic growth, at least 11 EM prime contractors exceeded goals for utilizing small business in 2017.

EM invests in preparing the next-generation workforce for good-paying jobs in fields like nuclear, engineering, science and construction where they can make a living and make a difference. Internships, fellowships, Science, Technology, Engineering and Math (STEM) classrooms visits, college nights, science bowls, and other initiatives are successfully introducing students to the many and varied opportunities available.

EM's Partners Key to Continued Success

Success like this isn't possible without all of EM's cleanup partners – federal employees, contractors and members of local communities. Secretary Perry and his top advisors have made these relationships a priority, making visits to sites like Portsmouth, Idaho, WIPP, Oak Ridge, Savannah River and Hanford. Increased engagement and improved communication with all stakeholders through cooperative agreements, site tours, public meetings, social media tools, advisory board input, and large-scale events like the National Cleanup Workshop, one of the largest EM-focused conferences in the country, is critical to EM progress. EM plans to carry this momentum into continued success across the complex in 2018.

Richland

- Treated 2.2 billion gallons of contaminated groundwater
- Made strides toward removing contaminated soil under Building 324
- Finished electrical, water, and road reliability project
- Finalized 283W Water treatment facility modifications
- Completed T Plant modification for receipt of K Basin sludge

“We’ve made tremendous progress on the demolition of the Plutonium Finishing Plant. It’s significant that Hanford’s skilled workforce made such strides undertaking this complex work, while also stabilizing a waste storage tunnel containing radioactive material, concluding the cleanup of a large burial ground, and preparing to move radioactive sludge away from the Columbia River, just to name a few significant achievements this year.”

Doug Shoop, Manager, Richland Operations Office

Safe, Efficient Tunnel Stabilization

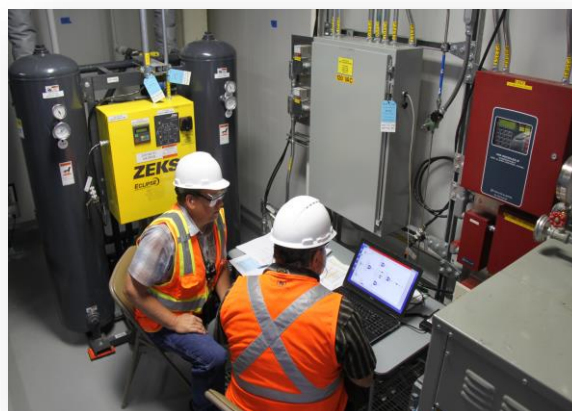
The Hanford Site received worldwide attention in May 2017 when the roof of a waste storage tunnel associated with the former Plutonium Uranium Extraction (PUREX) Plant partially collapsed. There was no spread of contamination after the partial tunnel collapse on May 9 or during emergency response work on May 10 to fill the hole in the tunnel, and no workers were injured in the incident or the response. To further stabilize the tunnel and provide additional radiological protection, workers pumped engineered grout inside and fully encapsulated the waste. Grouting does not preclude future remedial actions or final closure decisions. Workers completed grouting in mid-November, safely and ahead of the timeframe projected by the Department.



An aerial view of workers placing grout in PUREX Tunnel 1.



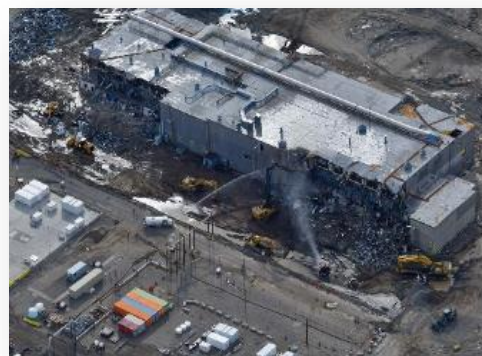
Workers place soil in the area of the partial collapse on PUREX Tunnel 1, immediately after the breach is discovered.



Workers check sludge removal equipment inside the K West Basin.



Demolition of the ventilation stack
at the Plutonium Finishing Plant.



Demolition of the main building in the
Plutonium Finishing Plant Complex

Little of Highly Contaminated Plant Left Standing

The landscape on Hanford's Central Plateau looks very different from a year ago, because of the demolition progress workers made at the Plutonium Finishing Plant (PFP), once considered the most hazardous building in the EM complex. Fifty years of plutonium production at PFP left the facility heavily contaminated. As of November 2017, portions of only two of four main PFP buildings continue standing.

Once a Burial Ground

After eight years of cleanup activity at Hanford's 618-10 Burial Ground and associated waste sites, sampling results have confirmed the cleanup is complete, and workers have transitioned to backfilling and demobilization of equipment. Fuel fabrication and research from 1954 through 1963 generated radioactive laboratory waste, including thousands of drums and different kinds of debris, deposited in the burial ground. Altogether, more than 500,000 tons of contaminated soil and debris was removed, packaged, and sent to the site's regulated landfill for disposal.



Workers remove contaminated soil and debris from the
618-10 Burial Ground.

Preparing for Soil Removal Under 324 Building

This year, Hanford workers made steady progress removing waste from the 324 Building's airlock to prepare for removing contaminated soil from beneath the building in 2019. The airlock helps provide contamination control when accessing adjacent hot cells and serves as an access point to install remote-operated equipment that will be used in the remediation work.

More Than Two Billion Gallons of Water Treated

Workers removed more than 145,000 pounds of contaminants, including radioactive elements, and treated more than 2.2 billion gallons of groundwater in their efforts to protect the Columbia River this year.



Workers remove a large hose reel from an airlock in the
324 Building.

Office Of River Protection



Brian Vance was named Manager, Office of River Protection in October

“ORP has a tremendous opportunity in the next few years to begin safely and permanently treating the first of Hanford’s tank waste.” I look forward to leading a talented and dedicated team and engaging with our cleanup partners and stakeholders to maintain the strong momentum we have underway to achieve our mission.”
Brian Vance, Manager, Office of River Protection

- ***ORP advances system to support WTP operations***
- ***Team completes testing for WTP switchgear building***
- ***ORP achieves significant step towards direct feed low-activity waste approach***
- ***Hanford WTP workers install equipment ahead of interim milestone***

New Manager Takes the Helm

In October, EM named Brian Vance the new manager of the Office of River Protection (ORP). Vance replaced Kevin Smith, who retired at the end of September after serving as manager since 2013.

Vance brings more than 30 years of leadership experience to ORP, serving in key roles with Westinghouse and AREVA, and as a career submarine officer. Prior to becoming ORP Manager, Vance was director of the 300-296 Remote Soil Excavation Project for Hanford cleanup contractor CH2M Hill Plateau Remediation Company.

Retrieving Waste from Underground Tanks

ORP marked two major accomplishments this year in addressing the 56 million gallons of radioactive waste stored in 177 underground tanks at Hanford. The age of the tanks, the makeup of the waste, and the proximity to the Columbia River make Hanford tank retrieval efforts among the most complex challenges within the EM program.

In February, workers completed the retrieval and transfer of high-level radioactive waste from tank AY-102 to meet a Settlement Agreement milestone with the State of Washington. This double-shell tank was discovered to be leaking between its inner and outer walls in 2012. The retrieval project was completed ahead of schedule and \$8.7 million under budget. The timely and cost-effective completion of this challenging work was recognized in October when the PMI named the tank recovery effort as its international Project of the Year for 2017.

In addition to the successful AY-102 project, tank operations contractor Washington River Protection Solutions (WRPS) is in the final stages of completing waste retrieval operations for single-shell Tank C-105, the 16th and final tank to be retrieved in Hanford’s C Farm. Waste retrieval activities have been completed to the limit of three technologies, and WRPS is now preparing to measure the amount of residual waste left in the tank.

Progress at WTP

ORP continued to make significant progress on the design and construction of portions of WTP. The WTP will process and treat the waste taken from Hanford's tanks for eventual disposal in a process called vitrification.

A key milestone in this effort was the assembly of two 300-ton nuclear waste melters at the WTP's Low-Activity Waste (LAW) facility. The melters are the largest of their kind ever built in the United States. The LAW facility – on schedule to be construction complete by next June – is integral to ORP's Direct Feed Low-Activity Waste (DFLAW) approach, intended to begin vitrification of Hanford tank waste in December 2021.

Additionally, a number of the technical challenges associated with the WTP's Pretreatment Facility were resolved this year to allow engineering to proceed in support of design and safety basis development. Testing was also completed with positive results on a full-scale vessel designed to safely mix radioactive waste as it moves through the facility.



Bill Hamel, the Office of River Protection Federal Project Director for the Waste Treatment and Immobilization Plant (WTP), and Peggy McCullough, former Project Director Bechtel National Inc speak at an event marking the melters milestone for the Hanford Site WTP



Employees from the Office of River Protection, Bechtel National, AECOM, and Atkins Engineering celebrated the completion of test operations for the final phase of full-scale testing of pulse jet mixed vessels and control systems in 2017

Savannah River Site

Preparing for Increased Robust Risk Reduction

The Savannah River Site's (SRS) Liquid Waste (LW) Program completed significant production outage work that will put the SRS Liquid Waste Facilities in a better operational position and make them more robust for 2018 and beyond.

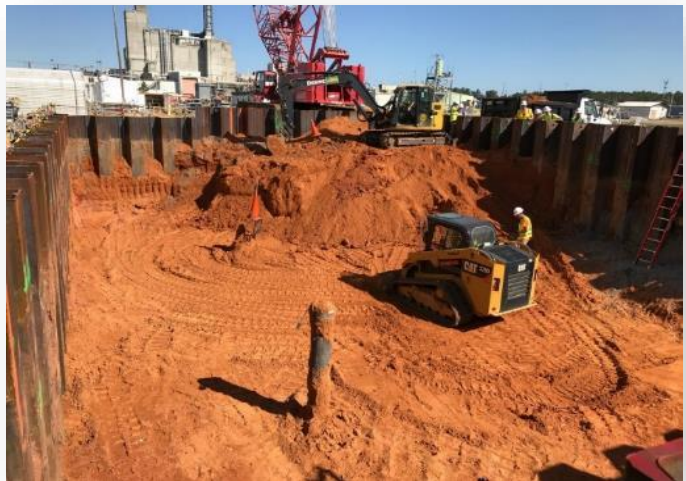
In February 2017, the LW System began with an outage of the Defense Waste Processing Facility (DWPF) for the removal and replacement of Melter 2. After 14 years of record-breaking performance, Melter 2—the vessel that treats radioactive liquid waste by blending it with a borosilicate glass to form a molten glass mixture which is then poured into stainless-steel canisters—was skillfully removed from the facility and transported to an on-site underground storage vault. Melter 3 was installed in July. Melter 2 operated three to five times longer than its design life. It poured 2,819 canisters, or 16 million pounds of glass, in its lifetime. DWPF's new Melter 3 is set to pour its first canister in December 2017.

During the 2017 LW System outage, significant tie-in work for the newly constructed Salt Waste Processing Facility (SWPF) also took place. This tie-in outage scope included sheet piling installation, facility flushing/drainage, excavation to uncover waste transfer lines, and piping modifications of those transfer lines, all to prepare for the initial tie-in of SWPF to the current Liquid Waste Facilities. Upon planned startup in December 2018, SWPF will process the bulk of the remaining salt waste inventory at SRS.

Meanwhile, alongside the LW outage, construction of the Site's first mega-volume Saltstone Disposal Unit (SDU) 6 was completed 16 months ahead of schedule and \$25 million under budget. The 32.8 million-gallon SDU will accommodate the larger stream of decontaminated salt solution that will come from SWPF. SDU 6 is more than 10 times larger than the six previously constructed units and the first of seven SDUs planned to store the remaining tank waste.



Melter 2, inside its storage box, was lowered by crane into an underground storage facility for safe, interim storage



Part of the Salt Waste Processing Facility tie-in outage work included sheet pile installation



The Savannah River Site's first mega-volume Saltstone Disposal Unit sits on 2-1/2 acres and will hold about 33 million gallons of saltstone. Construction was completed in 2017 under budget and ahead of schedule.

“SRS had a banner year in FY17, marked by readying our Liquid Waste facilities for increased cleanup progress ahead, notable improvements and innovation in operational milestones, and SRNL continuing to expand its scientific and technical influence. Going forward, we will increase the momentum that has yielded another successful year for SRS missions, ensuring we deliver real results for our country, our community and the environment.”

Jack Craig, Manager, DOE Savannah River Operations Office



An SRS Operator practices using tools in the 235-F mockup before performing the risk reduction work in the facility.



The D Ash Remediation project is 68 percent complete.

Maximizing Cleanup Innovation and Costs

The innovative and cost-saving Canister Double Stack Project at DWPF also continued in 2017. Two hundred radioactive glass-filled canisters have been moved to double-stacked positions since the first canisters were double stacked in August 2016. The Canister Double Stack Project will increase the storage capacity in the Glass Waste Storage Building 1 from 2,254 slots to 4,508 slots and will create adequate safe interim canister storage until at least Fiscal Year 2029. It also postpones the expense of another storage facility, allowing DOE to redirect funds to critical waste clean-up efforts while continuing DWPF’s mission of reducing the risk of waste remaining in the tanks.

Continuing Legacy of Operational Success

This year also marked several notable improvements and innovation in operational milestones for SRS. All SRS production facilities were operational for the first time since 2008. The Site completed the dissolution of the planned material test reactor spent fuel campaign and began receiving target residue materials from Canada. Production capability in HB Line was improved and plutonium down-blend operations continued in K Area.

- *Down-blended 16 kg of plutonium oxide in K Area*
- *Made nine transuranic waste shipments to WIPP*
- *Achieved closure of the Coal Pile Runoff Basin*
- *Removed and replaced DWPF’s Melter 2 after 14 years of record-breaking performance*
- *Completed significant tie-in work to connect the Salt Waste Processing Facility to the liquid waste facilities*
- *Completed construction of Saltstone Disposal Unit (SDU) 6, sixteen months ahead of schedule and \$25 million under budget*
- *Double stacked 200 canisters at DWPF’s Glass Waste Storage Building 1 to create adequate safe interim storage until FY2029*

EM's Savannah River National Laboratory: Putting Science to Work

EM's Savannah River National Laboratory continued to operate as a successful separate, independent business unit, steadily increasing its scientific and technical influence, missions and programs.

In 2017, SRNL was instrumental in reducing risk and increasing efficiency in major SRS processing facilities as well as expanding its technical support to EM sites across the DOE Complex. These efforts included:

- *Acceleration of H Canyon throughput:*

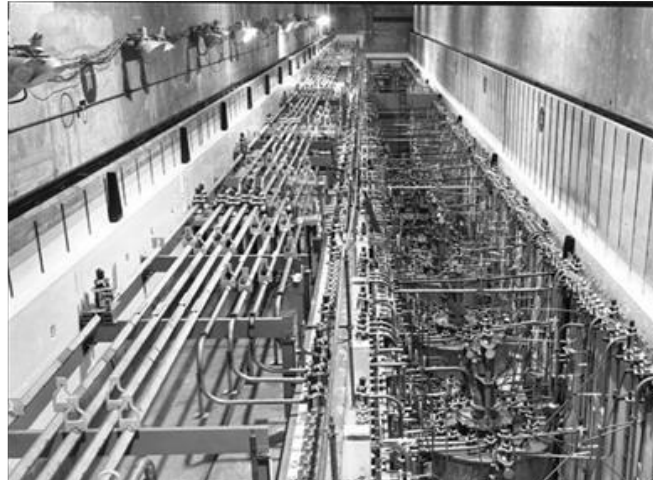
Based upon an improved flow sheet developed by SRNL and upon recommendations from an SRNL-led team of experts sponsored by EM to pilot SRNL's new Collaborative Innovation (COIN) process, H Canyon began implementing plans to modify the processing of spent nuclear fuel (SNF) stored at SRS to achieve at least 50% increase to the yearly baseline rate as well as other efficiencies.

- *Support to decommissioning work at Portsmouth Gaseous Diffusion Plant:*

Developed a 3-dimensional CAD model of Unit 1, Cell 1 of X-333 and integrated that model into a Virtual Reality (VR) program to train Portsmouth personnel to perform pending decommissioning Readiness Assessment activities. The VR training enables personnel to effectively learn and practice specific physical actions and the critical sequencing of those actions in a safe environment before conducting the actual dismantling of the large pieces of contaminated equipment.

- *Collaboration with small business on hydrogen fuel cells:*

Initiated a project with Hawaii Hydrogen Carriers on hydrogen fuel cells for forklifts through DOE's Small Business Voucher Pilot program. SRNL will be responsible for the design and performance of low pressure hydrogen storage systems to power mobile applications of Proton Exchange Membrane hydrogen fuel cells.



SRNL has been working to increase the throughput in H-Canyon where all work is completed remotely using cameras and cranes



John Bobbitt, Principal Engineer, SRNL Research and Development Engineering and Greg Meyer, Senior Vice President, Operations Fluor, work through a demonstration of the Virtual Reality training program designed to improve workers' and managers' abilities to safely perform D&D operations



Forklift powered by Hawaii Hydrogen Carriers' metal hydride-based storage system for fuel cell applications

Waste Isolation Pilot Plant



Secretary of Energy Rick Perry received a plaque commemorating his visit to WIPP on May 11, 2017.

- *Restarted waste disposal operations*
- *Resumed waste shipments*
- *Increased shipments to approximately six per week*
- *Received 100th shipment since restart and 12,000th shipment since opening*
- *Supplemental Ventilation System started-up in support of mining activities*



100th Shipment of TRU Waste arrives at WIPP since resumption of operations

"I am very proud of the extensive efforts of our workforce that went into opening WIPP and resuming shipments from EM generator sites. WIPP is once again fulfilling its highly critical and unique mission, the disposal of defense transuranic waste from around the DOE complex."

Todd Shrader, Manager, Carlsbad Field Office

Restarting Waste Disposal Operations

On Jan. 4, 2017, WIPP restarted its vital national mission of defense-related transuranic (TRU) waste disposal, with the first underground waste emplacement since 2014. The site contractor and DOE conducted operational readiness reviews in 2016, receiving authorization in December to resume emplacement. On Jan. 9, 2017, then Energy Secretary Ernest Moniz recognized WIPP's official reopening, joined by U.S. Senator Martin Heinrich and U.S. Representatives Steve Pearce and Michelle Lujan Grisham, as well as many state and local officials.

Resuming Waste Shipments

In April, after completing the emplacement of TRU waste that had been stored on site at WIPP since 2014, TRU waste generator site shipments to WIPP resumed with a shipment from Idaho. This was an important milestone not only for WIPP, but for all of the DOE sites that have been storing TRU waste since 2014.

Waste shipments have slowly and safely ramped up, now reaching approximately six per week, with shipping sites including Idaho, Savannah River, Oak Ridge and Los Alamos National Laboratory. In November, WIPP saw the 100th shipment since the resumption of operations and the 12,000th shipment since WIPP opened in 1999. WIPP shipment truck drivers have safely logged over 14 million miles of shipments.



WIPP waste handlers move transuranic waste into Panel 7 for permanent emplacement. The nation's only geological disposal facility for transuranic waste resumed operations in January 2017.

Recertifying WIPP

In July, the U.S. Environmental Protection Agency (EPA) recertified WIPP for continued operations. This decision is based on a thorough review of information submitted by DOE, independent technical analyses and public comments. DOE is required by law to submit documentation of WIPP's continued compliance with EPA disposal regulations for TRU waste at five-year intervals until the facility is decommissioned. EPA regulations are intended to ensure that WIPP will safely contain radioactive waste for a 10,000-year regulatory time period.

SVS Startup Anticipated in Support of Mining Activities

The completion of the Supplemental Ventilation System (SVS), which successfully completed testing and balancing, provides additional airflow that has allowed personnel to resume mining activities in Panel 8 in mid-December. Since the 2014 radiological release in waste disposal Panel 7, all air from the underground has been directed through HEPA filters. This filtration provides extra protection against any releases from the mine, but greatly reduces airflow and limits the personnel and use of diesel equipment underground. SVS start-up allows for sufficient airflow for mining by providing an alternative pathway for salt-laden air to exit the disposal system when mining is occurring. Traditional mining equipment will be used to mine seven disposal rooms in Panel 8. As with previous panels, each disposal room is 33 yards wide, 13 feet high and 300 feet long and can hold up to 10,000 drum equivalents of waste.



This continuous miner, located in the underground at WIPP, cuts the salt and creates space for the emplacement of transuranic waste. WIPP was mined into a 2,000-ft. salt bed which is more than 25-million years old.

Idaho

Protecting the Environment

Crews at DOE's Idaho Site made significant progress in 2017 with waste retrieval, treatment, packaging and shipment of waste as well as taking additional steps to protect the underlying Snake River Plain Aquifer.

The last stored transuranic (TRU) waste at the Advanced Mixed Waste Treatment Project (AMWTP) was retrieved more than six months ahead of schedule. Originally, some 65,000 cubic meters of waste were taken to Idaho from the now-closed Rocky Flats nuclear weapon production site. When the waste was brought to Idaho in the early 1970s, it was stored aboveground in a series of 14 storage cells later covered with soil.

TRU waste shipments resumed to the Waste Isolation Pilot Plant in early April and Idaho will finish the year with over 80 shipments of TRU waste to WIPP. In support of continued waste processing, integrated improvements were also completed in some of the AMWTP facilities. Two new BROKK robots were installed in the boxlines, hydraulics were upgraded and the box opening gantry robot was replaced.

In addition, 251,000 pounds of solvent vapors from beneath the Subsurface Disposal Area have been removed and destroyed through catalytic oxidation units. Groundwater treatment of nearly 700 million gallons also continues at Test Area North to remove organic compounds from the Snake River Plain Aquifer.

Significant progress continues to be made at the Radioactive Waste Management Complex. Subsurface Disposal Area targeted buried waste retrieval within the eighth retrieval enclosure is 80 percent complete. Overall, the Accelerated Retrieval Project is two years ahead of schedule, and thus far, 4.75 of 5.69 acres have been exhumed. Construction of Accelerated Retrieval Project (ARP) IX was completed in 2017, and the facility will begin exhuming the last targeted buried waste under the 2008 Record of Decision in the spring 2018.

"The Idaho workforce continues to make significant progress in protecting the Snake River Plain Aquifer by exhuming buried waste, shipping TRU waste out of Idaho, and moving forward with plans to treat the remaining liquid waste. We remain focused on our commitments to the state of Idaho, and continue to take steps towards meeting our remaining cleanup milestones."

Jack Zimmerman, Deputy Manager, Idaho Cleanup Project, DOE Idaho Operations Office



The Advanced Mixed Waste Treatment Project resumed shipments to WIPP in early April and has completed more than 60 shipments during the calendar year.

- *Received Carlsbad Field Office approval of an AMWTP waste stream for shipment and disposal at WIPP*
- *Moved 20 percent of Advanced Test Reactor spent fuel of the Idaho Nuclear Technology and Engineering Center (INTEC) wet storage basin to dry storage*
- *30 percent design for the SDA Cap completed and in review*
- *Within the first year of the Idaho Cleanup Project - completed Phase I and II DOE ISMS assessments - received ISO14001 Environmental Management System certification*

Working Towards Success



Idaho Governor C.L. "Butch" Otter recognized the accomplishments of the Advanced Mixed Waste Treatment Project workforce during a celebration in early March.

The Integrated Waste Treatment Unit's newly redesigned auger-grinder was successfully tested in a March demonstration run and the project continues to make improvements to the facility's primary reaction vessel in anticipation of an early 2018 demonstration involving simulant. Pilot plant testing at the Hazen facility in Denver, CO has significantly improved DOE's knowledge of fluidization and chemistry issues within the Integrated Waste Treatment Unit. The Hazen facility has over 800 hours of operation, processing in excess of 10,000 gallons of simulant with the newly redesigned dual plenum modification for the Denitration Mineralization Reformer vessel installed.

Positioning for the Future



Workers retrieved the last box of stored transuranic waste at the Advanced Mixed Waste Treatment Project in February, more than three months ahead of Fluor Idaho's contractual milestone.

The Calcine project is involved in the engineering design of a high-level waste transfer system that will move an estimated 220 cubic meters of radioactive waste from an older storage bin to a newer facility. Testing of two types of robotic equipment expected to assist in the transfer of the calcined waste was completed in 2017. The waste was generated from spent nuclear fuel reprocessing conducted decades ago. The retrieval and transfer of material from one storage bin to another is a part of a larger project needed to meet a milestone in a legal agreement with the state of Idaho.



Workers paved a large section of the tank farm at the Idaho Nuclear Technology and Engineering Center to protect the underlying Snake River Plain Aquifer

Spent nuclear fuel crews completed 100% of the scheduled spent fuel transfers of Navy spent fuel and EBR-II spent fuel to the Naval Reactors Facility and the Fuel Conditioning Facility respectively. The wet storage spent fuel basin located at the Idaho Technology and Engineering Center (INTEC) is at just 20 percent capacity. Idaho has made several transfers onsite of spent nuclear fuel from wet to dry storage. All spent fuel must be in dry storage by 2023.

As an interim measure to further protect the underlying Snake River Plain Aquifer, nearly two-thirds of the INTEC tank farm was paved, 8 weeks ahead of the regulatory date. Once all tank waste has been removed from the tank farm the area will be closed and a permanent cap will be installed.

Oak Ridge



Rendering of the K-25 History Center, Equipment Building and Viewing Tower that are scheduled to be open in 2019.

Working Toward a Vibrant Future at ETPP

Oak Ridge is continuing to advance toward its goal of completing major cleanup at the East Tennessee Technology Park (ETPP) by 2020.

The work underway is transforming the site into an attractive community-owned asset. Crews continue to alter the skyline by removing old electrical switchyards and demolishing numerous excess facilities, including several facilities that formerly supported uranium enrichment operations. The cleanup contractor is also working inside many other facilities to prepare them for demolition by 2020.

Hundreds of acres have been transferred from government ownership at ETPP in 2017— moving toward EM's ultimate vision for the site as a privately-owned and operated industrial park. Companies are seeing significant signs of potential and investing in its future. This year, a company onsite refurbished the barge area to enable transport of large equipment from Michigan to Oak Ridge via river systems, adding to the existing offerings and infrastructure at the site. Additionally, work is underway on the K-25 History Center which will preserve the site's Manhattan Project and Cold War achievements for future generations.

- *Completed demolition of the K-732 Switchyard, K-832, K-832-H, and K-1203 at ETPP*
- *Continued risk reduction activities to stabilize high risk facilities at Y-12 and ORNL*
- *Resumed TRU waste shipments to WIPP for the first time since 2012*
- *Began site preparation for the Mercury Treatment Facility at Y-12*
- *Completed the U-233 direct disposition campaign shipments from ORNL*
- *Finalized designs to begin construction on the K-25 History Center*



A private business, UniTech, refurbished an old barge access area at the East Tennessee Technology Park.



Workers tear down the K-832 Cooling Water Pumphouse.

Reducing Oak Ridge's Safety Risks and Waste Inventory

Through the Excess Contaminated Facilities Initiative, Oak Ridge continues to remove risks and stabilize a portion of the 350 excess, contaminated, and deteriorating facilities that are not scheduled for near-term demolition at the Y-12 National Security Complex and Oak Ridge National Laboratory.

This year, projects included characterization, asbestos removal, and mercury extraction for buildings at both sites. These projects are helping enhance safety and prevent the facilities from deteriorating as rapidly—lowering cleanup costs significantly, preventing the spread of contamination, and helping create safer environments for future crews.

The program is also successfully reducing its inventory of waste located onsite. Oak Ridge also resumed shipping its inventory of treated transuranic waste to WIPP. The program also completed its Uranium-233 Direct Disposition Campaign, which removed half of the inventory that was stored at ORNL.

Preparing for the Next Big Cleanup

Oak Ridge continued laying the foundation for large-scale cleanup to transition from ETPP to the Y-12 National Security Complex. The biggest development was the groundbreaking for a new Mercury Treatment Facility at Y-12. The facility is a vital project for Oak Ridge's EM program because it opens the door for the demolition of large, deteriorated, mercury-contaminated facilities and soil remediation by providing a mechanism to limit and control potential mercury releases. When operational, the facility will be able to treat 3,000 gallons of water per minute and includes a 2-million gallon storage tank to collect stormwater. The facility will aid in working toward meeting regulatory limits with the U.S. Environmental Protection Agency (EPA) and the State of Tennessee, and it will provide critical infrastructure needed to achieve DOE's Vision 2024.

“Our employees achieved significant progress and maintained our program's momentum in 2017 – moving closer to EM's ultimate vision for the East Tennessee Technology Park and laying the foundation for large-scale cleanup to begin at the Y-12 National Security Complex. This cleanup is removing barriers to economic development and helping enable ongoing national security missions.”

Jay Mullis, Manager, Oak Ridge Office of Environmental Management



Workers remove asbestos from Oak Ridge National Laboratory Building 7500



Crews work to clean and remove the old column exchange (COLEX) equipment at Alpha 4



Rendering of the Mercury Treatment Facility underway at the Y-12 National Security Complex.

Los Alamos

The Environmental Management Los Alamos Field Office's (EM-LA) commitment to safety contributed greatly to its success in 2017. Significant progress was made in legacy waste management and in the cleanup campaigns governed by the 2016 Compliance on Consent Order (Consent Order). Throughout the year, EM-LA further positioned itself to make a smooth transition to the Los Alamos Legacy Cleanup Contract, a dedicated cleanup contract for legacy waste cleanup and management at Los Alamos National Laboratory (LANL).

EM-LA successfully completed all of the 2017 milestones set under the Consent Order with the New Mexico Environment Department (NMED). The Consent Order provides a framework for the cleanup of legacy wastes at LANL. The past year was the first full calendar year during which milestones were established under the Consent Order.

The Chromium Project, one of the cleanup campaigns under the Consent Order and EM-LA's main environmental cleanup priority, is focused on addressing the hexavalent chromium plume in the regional aquifer beneath Sandia and Mortandad canyons. During this past year, the project team constructed the infrastructure necessary to fully implement the Interim Measure (IM) and continued field and laboratory studies toward determining a final remedy. The IM, which involves extracting contaminated water and injecting treated water to control plume advancement and shrink its footprint, underwent initial testing in 2017.



Technicians treated the RNS drums inside a glove box at the Waste Characterization, Reduction and Repackaging Facility.



Treated RNS drums were transported to Area G for storage.

- **Completed all of the Fiscal Year 2017 Consent Order milestones.**
- **Completed cleanup of the final two known legacy sites in the Los Alamos townsite.**
- **Completed treatment of 60 remediated nitrate salt drums.**



After carefully securing a spider excavator to a crane, the excavator was lowered to the cleanup site on the side of a canyon

'This past year was a pivotal one for EM-LA. We made significant progress on a number of key program initiatives, including successfully executing our Consent Order milestones, constructing the infrastructure necessary for the Chromium Project's Interim Measure, and treating the remediated nitrate salt drums. The latter demonstrated effective collaboration between multiple organizations and our commitment to the safety of the workers, the public and the environment. Having laid the foundation for a dedicated environmental cleanup contractor under the Los Alamos Legacy Cleanup Contract, we have positioned ourselves to continue to make significant project- and program-related progress in the year ahead. As we execute our mission in 2018, our focus will remain on safety, efficiency, and transparency.'

**Doug Hintze, Manager, Environmental Management
Los Alamos Field Office**



Angled drilling, at wells such as at the CrIN-4, enabled the project team to reach objectives and avoid culturally sensitive sites.

In the summer of 2017, the final two known legacy sites requiring soil cleanup in the Los Alamos townsite were cleaned up along Los Alamos Canyon. Their relatively inaccessible location, combined with the steep and uneven topography of the canyon, required the use of a crane to enable the safe movement of a spider excavator, fieldwork personnel, waste bags, and restoration materials. The project was part of the Historical Properties Completion Campaign, one of the campaigns also governed by the Consent Order.

EM-LA's primary legacy waste management activities in 2017 focused on treating remediated nitrate salt (RNS) drums located at Area G. Treatment of the 60 RNS drums began in May and completed successfully in early November. The 60 RNS drums consisted of a similar composition as the drum that caused an event at WIPP in February 2014. Treatment of the 60 RNS drums was done at the Waste Characterization, Reduction, and Repackaging Facility. The process involved removing the RNS waste from drums and mixing it with water and zeolite—an inert material—to render the waste non-reactive. The treated RNS was repackaged in drums that are being stored at LANL, and will eventually be shipped to WIPP for disposal. Throughout the process, a strong safety culture was maintained and the safety of the workers, the public and the environment was the top priority.

To further characterize the Royal Demolition Explosives (RDX) plume beneath LANL property, the project team drilled well R-68 to refine the conceptual model for RDX pathways into the regional aquifer. The team also established long-term monitoring network and completed a report on aquifer and tracer testing.



A spider excavator crawled along the side of the canyon to the second cleanup site.

A groundwater sampling system was installed at the monitoring well R-68.



Workers sealed bags of contaminated soil prior to transportation and shipment to an offsite disposal facility.

Portsmouth/Paducah Project Office

Portsmouth Gaseous Diffusion Plant Site

Process Building Deactivation

Deactivation work in the high-enrichment process building (X-326) focused on removal of legacy wastes and extensive characterization of all of the process piping networks to assure that residual uranium has been removed and the remaining structure and contents are deemed 'criticality incredible'.

Work on the site's X-333 Process Building continued as large components were prepared for size reduction using remote-operated plasma torches and high-strength metal shears, both major enhancements to worker safety.

On-Site Waste Disposal Facility

Four key subprojects related to the On-Site Waste Disposal Facility (OSWDF) were completed in 2017:

- The construction of the eight-acre Sedimentation Pond 3 which is vital to control of uncontaminated surface water during the lifespan of the OSWDF. Construction was also initiated on Sedimentation Pond 4.
- The construction and installation of the Raw Waterline Booster Station was completed in September, providing water that will support construction activities throughout construction and operation of the OSWDF.
- Also in September, construction of the initial section of the OSWDF Access Control Facility was completed. This will be the main access point for OSWDF personnel, delivery of materials, and equipment, as well as control access to the OSWDF project area.
- More than one million cubic yards of material were moved in the cut and fill rough grading operations for site preparation.



Extensive characterization occurred in Portsmouth X-326 Process Building in 2017, work that is instrumental in achieving Cold & Dark status.

- *Four key projects were completed as part of construction efforts for the Portsmouth On-Site Waste Disposal Facility*
- *PPPO completed a package that sets the stage for the transfer of 80 acres to the Southern Ohio Diversification Initiative*
- *A collaboration between DOE and Carnegie Mellon University demonstrated how robotics technology can assist at Portsmouth and throughout the DOE complex*



Progress continued on the construction of Portsmouth's On-Site Waste Disposal Facility in 2017.



PPPO completed a property transfer package for 80 acres in 2017. The transfer is anticipated to be completed in spring 2018 pending final approval.



Robotics technology was demonstrated at Portsmouth in 2017 in collaboration with Savannah River National Laboratory and Carnegie Mellon University in alliance with University of Nevada, Reno.

“In 2017, the Department of Energy was pleased to support economic re-development in Southern Ohio by preparing to transfer to the community the first parcel of property from the Portsmouth Site. In parallel with this process we have continued to meet critical milestones in the Deactivation and Decommissioning of the gaseous diffusion plant.”

Robert Edwards, Manager, Portsmouth/Paducah Project Office (PPPO)

Property Transfer

PPPO set the stage for the transfer of 80 acres of property to the Portsmouth Community Reuse Organization, the Southern Ohio Diversification Initiative. After a lengthy process with the Ohio EPA and the Ohio Department of Health, the state of Ohio concurred with EM’s Environmental Baseline Survey – a key component of the transfer package – that declared the property suitable for transfer. If given final approval, the transfer is anticipated to be completed in spring 2018.

Robotics Technology Development

PPPO at Portsmouth was part of a cooperative effort with the Savannah River National Laboratory and Carnegie Mellon University in alliance with University of Nevada, Reno, to explore robotics technologies that can be implemented during the Portsmouth Decontamination and Decommissioning (D&D) Project.

A virtual-reality model of a process building (X-333) enrichment cell and enrichment components was developed to simulate work conditions. This system is being used to train workers in a virtual environment to further enhance worker safety and productivity.

The EM Technology Development Office is also supporting the project and enhancing worker safety by developing a robotic pipe-crawler hold-up measuring system to characterize much of the piping in the X-333 to verify criticality. The “DiscoBot” system has been developed by Carnegie Mellon University in alliance with University of Nevada, Reno, and the prototype was successfully demonstrated at Portsmouth in 2017. In addition to greatly reducing worker exposure to contamination, this robotic system can potentially reduce and/or replace the much costlier, time-consuming piping remove-and-handle operations with the more economical, faster demolish-in-place using normal heavy equipment.

The EM Infrastructure and D&D Office co-sponsored a project with the Electric Power Research Institute to demonstrate the LaserSnake2 to assess its potential application for cutting the large converters at the X-333 building. The demonstration project was delivered by NuVision Engineering, The Welding Institute (TWI) and OC Robotics using an integrated snake arm robot and cutting laser. The demonstration showed how effective the robotically controlled laser cutting system is at size-reducing large metal and concrete structures.

Paducah Gaseous Diffusion Plant Site

Significant Remediation Progress Achieved

In August, a final regulatory agreement was reached to accelerate the investigation and cleanup of the C-400 Complex – the site’s largest source of off-site groundwater contamination – and then perform the cleanup of the soils, slabs and source groundwater contamination.

Optimization of the Northeast plume pump-and-treat system, which controls and mitigates the migration of the off-site groundwater contamination plume on the east side of the Paducah Site, was completed ahead of schedule and under budget. Field activities included the installation of monitoring wells, piezometers and two new extraction wells to increase capture zone and removal of contamination in the groundwater. To date, pump-and-treat operations for the Northeast and Northwest plumes have treated approximately 4 billion gallons of groundwater.

Through extensive remediation activities, approximately 61 acres of radiologically controlled areas were approved for down posting to non-radiation areas. These cleanup efforts resulted in overall cost savings.

New Cleanup Contract Awarded

PPPO transitioned a new Deactivation and Remediation Contractor at Paducah, Four Rivers Nuclear Partnership. Its \$1.5-billion performance-based contract is for a period of up to 10 years (including option periods). A long-term contract had been identified as a high priority by Paducah stakeholders.

Safety and Security Prioritized

The workers for the Paducah Site Deactivation and Remediation Contract reached a significant milestone of more than 5 million safe work hours without a lost-time workday case.

The Paducah Safeguards and Security team was presented with DOE’s Outstanding Security Award for their exemplary security services. The team demonstrated a high degree of teamwork while developing an operational plan for transitioning an existing safeguards and security mission to one consistent with Department of Energy security policies and directives.

“PPPO’s revised cleanup strategy prioritizes the Paducah Site’s most critical cleanup priorities. In 2017, we redoubled our focus toward completing the optimization of facilities and infrastructure and zeroed-in on the number-one groundwater remediation priority.”

*Robert Edwards, Manager,
Portsmouth/Paducah Project Office
(PPPO)*



Drill operators attach a section of pipe to continue drilling wells for Paducah’s Northeast pump-and-treat system optimization.



Northwest view of the Paducah C-400 Cleaning Building



The Safeguards & Security team poses with PPPO Security Team Lead Mark Allen (second from left) during a training exercise

Depleted Uranium Hexafluoride (DUF6) Conversion

The Depleted Uranium Hexafluoride Conversion Project, following a safety shutdown period and retooling, re-started its Paducah facilities and achieved respectable production numbers while the Portsmouth facilities approached re-start. Transition to a new operations and maintenance contractor was successfully completed. Also in 2017, the project's reaffirmed culture of "One project, seven production lines" – as opposed to two separate plants – was already paying dividends with more lessons learned and efficiencies gained through common design modifications.



MCS workers move a DUF6 storage cylinder as the Paducah plant resumed production operations.

- *Optimization of NE Plume Pump-and-Treat System installation of 14 monitoring wells and two new extraction wells*
- *Awarded a Deactivation & Remediation performance-based contract valued at approximately \$1.5 billion over 10 years*
- *More than 5 million safe work hours without a lost workday case*
- *Safeguards and Security team received an Outstanding Security Award for exemplary security services*
- *Timely transfer of DUF6 operations to a new operations and maintenance contractor, Mid-America Conversion Services, LLC (MCS)*
- *The Paducah facility achieved 1-million man hours of work without a lost time incident, earning the Kentucky Labor Cabinet Governor's Safety and Health Award*
- *Routinely operated all four conversion lines at Paducah, producing more than 5,000 metric tons of uranium oxide and 800,000 gallons of hydrofluoric acid for use in commerce*



Portsmouth/Paducah Manager, Robert Edwards (right) signed the partnering framework with MCS on March 28th.

"At PPPO we assembled a knowledgeable and experienced DUF₆ Conversion Project team in 2017, and we're leveraging it with a partnering approach to help ensure safety and effective operation of our seven conversion lines at Portsmouth and Paducah." Robert Edwards, Manager, Portsmouth/Paducah Project Office (PPPO)

Nevada National Security Site

The Nevada National Security Site (NNSS) is a research, evaluation, and development complex that supports homeland security, national defense, and nuclear nonproliferation. Located 65 miles northwest of Las Vegas, the NNSS was the site of 100 atmospheric and 828 underground nuclear weapons tests conducted between 1951 and 1992. As a result, the Environmental Management (EM) Nevada Program is addressing the nuclear legacy of contaminated soil, facilities, and groundwater. In addition, the NNSS provides a crucial low-level waste disposal facility that supports similar legacy cleanup across the Nation.

One of the most significant achievements in 2017 was the kickoff of the External Peer Review of the Rainier Mesa/Shoshone Mountain underground test area where 68 underground nuclear detonations occurred. Four independent experts in the fields of geology, hydrogeology, and environmental cleanup and regulation were selected from a pool of 22 qualified applicants. This panel began their evaluation with an extensive tour of the NNSS in October and will thoroughly examine technical reports, characterization information collected since 1991, and the Alternative Modeling Strategy. The panel will continue their review in 2018 beginning with a follow-up meeting with EM Nevada Program scientists in January of 2018.



A hydrologist with the contractor supporting the EM Nevada Program conducts a groundwater demonstration for Amargosa Valley students

- *Kicked-off the External Peer Review of the Rainier Mesa/Shoshone Mountain groundwater characterization area*
- *Completed the sampling of 28 groundwater wells*
- *Commenced cleanup of the historic Clean Slate II site on the Tonopah Test Range*
- *Safely and efficiently disposed more than 900,000 ft³ of classified, low-level, and mixed low-level radioactive waste at the Area 5 Radioactive Waste Management Site*
- *Began construction of a new, RCRA-permitted mixed low-level radioactive waste disposal cell at the Area 5 Radioactive Waste Management Complex*



NSSAB members accompany Radioactive Waste Acceptance Program staff on an evaluation of a waste generator in Idaho

“Strengthening two-way communications with the public, culturally-affiliated tribes, local government, and state agencies promotes the exchange of valuable information, contributing to efficient solutions that are protective of human health and the environment.”

*Rob Boehlecke, Program Manager,
Environmental Management Nevada Program*

Another important step toward closure of contaminated sites on the Tonopah Test Range was achieved for Clean Slate II, the location of a 1963 non-nuclear detonation that dispersed radionuclides into the surrounding soil. Decades of hard work and cross-agency collaboration led to agreement of cleanup levels and formal approval of the remediation plan in June 2017. This accomplishment followed months of extensive briefings and distribution of information for residents in nearby communities in anticipation of the planned 300 shipments to transport the contaminated soil and debris to the NNS. Cleanup activities at the site commenced in October 2017 and will continue into 2018.



NNSAB members join scientists with the Underground Test Area Activity to observe a groundwater pumping technology for potential use at the NNS



Contaminated debris removed from an Area 3 Plutonium Dispersion Site is placed in a waste package for disposal at the Area 5 Radioactive Waste Management Complex

Key to supporting cleanup of the Clean Slate II site is the NNS Area 5 radioactive waste disposal facility where more than 900,000 cubic feet of classified, low-level, and mixed low-level waste was disposed in 2017. This included supporting the safe completion of a multi-year Campaign to dispose of materials from the Oak Ridge site. In addition, to ensure the continued availability of critical disposal capabilities for DOE sites across the U.S., the NNS received State of Nevada approval in July 2017 for a Resource Conservation and Recovery Act (RCRA) permit modification application to construct a new mixed low-level waste disposal cell. Excavation of the disposal cell began in September 2017 and it is anticipated to be operational in April 2018.



Groundwater sampling at well ER-20-12 on Pahute Mesa



Waste disposal activities at the Area 5 Radioactive Waste Management Complex

West Valley Demonstration Project

Vitrification Facility Demolition Underway

DOE achieved visible progress in its cleanup efforts at the West Valley Demonstration Project with the start of demolition of the site's Vitrification Facility. Work began on September 11, marking the first facility of its kind to be demolished in the U.S. and the first major radiological structure to be demolished at the WVDP. When complete, the demolition will forever change the landscape at the site.

The start of demolition was preceded by years of planning and preparation, including removal and offsite disposal of major components from the HLW Vitrification Cell, which operated from 1996 to 2002. During its operation, the facility safely converted more than 600,000 gallons of HLW into vitrified glass, safely encapsulating 25 million curies of radioactivity into a stable waste form. The facility is one of only two to operate in the U.S.

To prepare for its demolition, CH2MHILL BWXT West Valley, LLC, prime contractor to DOE, completed removal of vitrification-era and other waste materials from the facility and conducted extensive decontamination activities within the closed Vitrification Cell. After all accessible piping was removed, cell wall penetrations were sealed with expandable foam to prevent migration of contamination from within the cell to the outside. Cell surfaces were washed and sprayed with fixative to seal any residual contamination in place. Grout was applied to the floor to reduce worker exposure and to prevent water infiltration into below-grade areas of the building. Prior to demolition, all utilities were disconnected and air-gapped to verify deactivation.

Demolition of the three-story reinforced concrete and steel structure proceeded steadily since September, with the first of three phases nearly completed at the end of the year. In early 2018, efforts will focus on demolition of the reinforced concrete Vitrification cell, shield door removal and demolition of a concrete tunnel that connects the structure to the Main Plant Process Building and offsite waste disposal.



Stacy Charboneau, EM Associate Principal Deputy Secretary for Field Operations, presents DOE VPP Star Award to Rob Dallas, Lodge 2401 President of International Association of Machinists and Aerospace Workers. At right is Jeff Bradford, CHBWW President and General Manager



New data center installed to house telephone and computer server equipment being removed from the vacant Administration Building

"The start of Vitrification Facility demolition has really brought this site full circle. This is one of the first sites in the nation to vitrify High Level Waste, and now the first site to complete that process and demolish the building."

Bryan Bower, Director, DOE-West Valley Demonstration Project



"First Bite" in Vit Facility demolition. Sept 11, 2017



First piece of Vit Cell demolished. Nov 8, 2017



Last drum of legacy waste packaged for removal from the Main Plant Process Building



Intermodals containing Vit Facility waste loaded on railcars at Blasdell, NY transloading facility

- *Completed recertification in the DOE-Voluntary Protection Program at the STAR level. CH2MHILL BWXT West Valley, LLC, the site's prime contractor, was also awarded the Legacy of Stars Award, for achieving the Star of Excellence award for four consecutive years*
- *Accelerated offsite legacy waste shipments, completing 25 shipments in 2017. Also completed removal of all legacy waste from the Main Plant Process Building (including 241 drums of transuranic waste)*
- *Achieved significant progress toward preparing the Main Plant Process Building for demolition*
- *Completed first two major site infrastructure upgrades with installation of a new treatment facility for potable water and installation of a new communications and data center hub*

Separations Process Research Unit (SPRU)

SPRU Safety

From mid-November 2014 through September 2017, project crews worked 1,038 days and 786,962 total safe work hours without a lost time accident.

Building G2

SPRU project crews completed the open-air demolition of the G2 Building and began the process of backfilling. The pre-open air demolition effort included removing process equipment and piping consisting of 19,379 linear feet of contaminated piping, 15,611 linear feet of contaminated tubing, 4,256 linear feet of conduit and 1,297 linear feet of ductwork. After the building was removed, soil below the excavation was characterized and independently verified to meet clean up criteria by the Oak Ridge Institute for Science and Education (ORISE).

Building H2

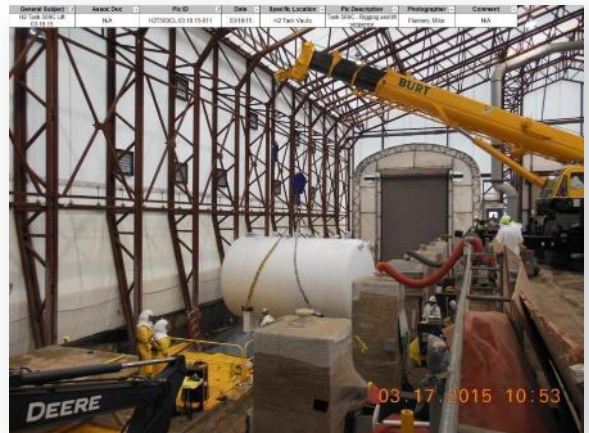
SPRU project crews completed decommissioning and decontamination of the H2 Building in preparation for open air demolition. The process equipment and piping were removed. The SPRU project proceeded to begin open air demolition of the H2 structure near the end of the fiscal year and is anticipated to complete the demolition by Spring 2018.

“During Fiscal Year 2017 SPRU project transitioned from decontamination and process equipment removal from the buildings to demolition of the remaining contaminated concrete and steel structures. The contractor finished removal of greater than ninety percent of the radiological liability from the buildings, and did so without a lost time work injury.”

Steven Feinberg, Director, SPRU



G2 building enclosure



Removal of tanks from H2 tank vault



With tanks removed, the building is ready for open air demolition

Moab Uranium Mill Tailings Remedial Action (UMTRA) Project

For 2017, the Moab Project anticipated shipping about 458,900 tons of uranium mill tailings from the former Moab ore-processing site 30 miles to the Crescent Junction disposal site, both in Utah. This amount exceeded the planned total for this period by 8,600 tons. By year's end, more than 8.9 million tons of tailings total will have been relocated away from the Colorado River, which borders the Moab site on the east and lies 750 feet from the base of the mill tailings pile. This work was completed safely, and project employees have worked more than 450 days without a lost-time injury or accident.

Construction of the disposal cell continued with excavation of another 500,000 cubic yards of the third phase. Also, a polyurea lining was sprayed on the inside of 50 metal shipping containers. The lining helps prevent further corrosion of the inside of the containers due to the tailings material.

The project focused its efforts on mitigating the risk of equipment failure by replacing some aging heavy equipment. Five new reach stackers used to transfer shipping containers to and from haul trucks and railcars at the project sites were procured. In addition, a new dozer, haul truck, and water wagon were purchased.

The water wagon holds 8,000 gallons, doubling the capacity of existing water trucks. The water wagon is used at the Moab site inside the Contamination Area for dust suppression. The larger capacity brought efficiencies by reducing the frequency of refilling the tank and reducing the number of water trucks needed. The water wagon and trucks use contaminated ground water extracted from wells as part of an interim remedial action system. The Project extracted almost 8.4 million gallons of contaminated water, exceeding the projected annual volume ahead of schedule.

The Technical Assistance Contract (TAC) for the project was re-competed and awarded to the incumbent, S&K Logistics Services, LLC. The 5-year contract has a value of up to \$24.5 million. The TAC provides technical and administrative services to DOE and manages the environmental air monitoring and ground water programs.

"This year has been a productive one for the Moab Project. This summer, the Project added four containers of mill tailings to each trainload, enabling us to exceed our fiscal year shipping goal. We also used money received above the President's budget request to purchase much-needed equipment and reduce Project risk. The work was accomplished safely without a lost-time injury or accident."

Ellen Mattlin, Former Acting Director, Moab



Above: The new water wagon sprays water for dust suppression at the Moab site. Below: A scraper and a bulldozer work in tandem to excavate Phase 3b of the Crescent Junction disposal cell.

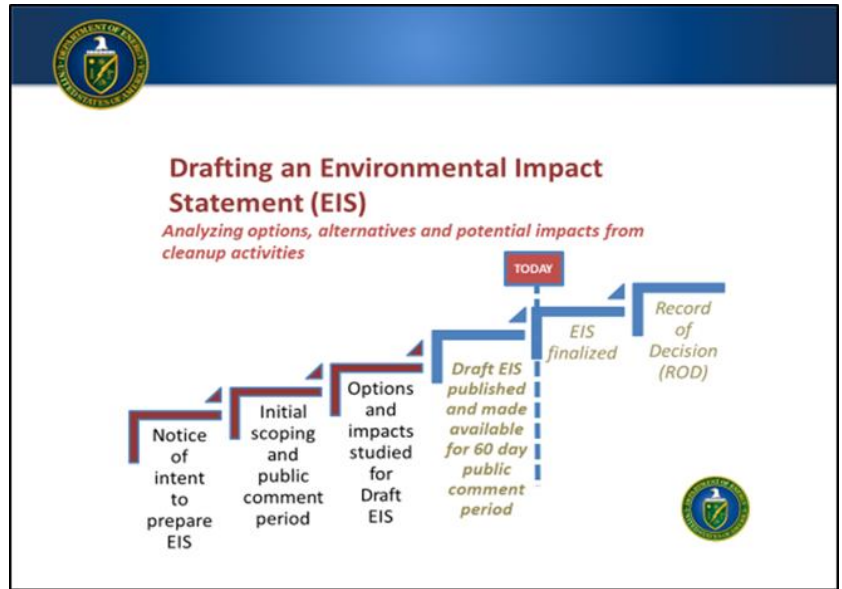


- **Exceeded 2017 goal of shipping 450,300 tons of uranium mill tailings by 8,600 tons**
- **Phase 3b of the disposal cell at Crescent Junction was excavated, creating almost 866,000 cubic yards of additional capacity for permanent storage of contaminated materials from the Moab site**
- **Replaced aging equipment to improve Project efficiencies and mitigate Project risks**
- **Extracted almost 8.4 million gallons of contaminated groundwater from wells, preventing contaminants from reaching the Colorado River**

Energy Technology Engineering Center (ETEC)

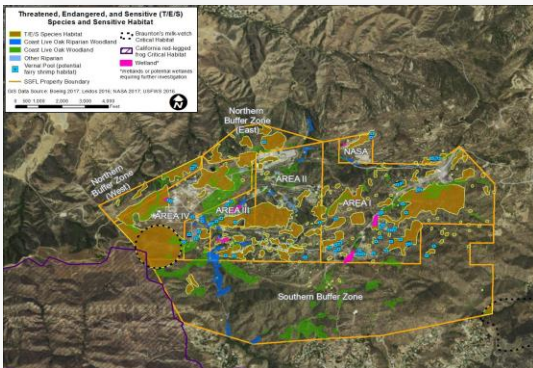
Environmental Impact Statement

The ETEC office published the Draft Environmental Impact Statement (DEIS) for the site on January 13, 2017. This was a tremendous accomplishment which was achieved by working through all levels of DOE to ensure the Department was fully advised of its major implications. The DEIS included a range of alternatives that articulated the trade-offs of various options. ETEC is responding to 2,200 individual comments received and is preparing a Comment Response Document.



ETEC review of potential wetlands

- Completed a draft programmatic agreement that was presented to the Native American council
- Completed the DOE section of the Remedial Investigation for groundwater which was provided to California Department of Toxic Substances (DTSC)
- Began formal consultation with the U.S. Fish and Wildlife Service as required by Section 7 of the Endangered Species Act by submitting a Biological Assessment



Threatened, endangered, and sensitive species and sensitive habitat at ETEC

“2017 provided an opportunity to work towards completion of several key environmental documents for ETEC. The Draft EIS, submittal of the Biological Assessment, continuation of government-to-government consultation with Native American tribes, and the extensive work on groundwater moved the site towards final decisions that lead to site closure. It was a team effort of dedicated professionals to get all of the work accomplished in 2017.”

John B. Jones, Director, ETEC

Lawrence Berkeley National Laboratory Old Town Demolition

Phase I Project Completion and Phase II Planning

The Old Town team completed the Phase I project by removing the Building 16 and Building 52/52A concrete slabs and associated underground utilities and contaminated soil. Phase II planning continues.

Phase III Project

The Old Town team commenced the Phase III project to remove additional contaminated soil, abandoned and deactivated utilities and concrete from the Building 5, 16 and 52/52A areas.



Remediation progress at LBNL has been significant as evidenced by the differences in the Old Town skyline between May 2014 (left) and October 2017 (below)



“The Old Town team successfully completed the Phase I project and continues the area cleanup in the effort to make available the land for future Office of Science mission growth.”

Kevin Bazzell, Federal Project Director, LBNL