



U.S. DEPARTMENT OF
ENERGY

OFFICE OF
**ENVIRONMENTAL
MANAGEMENT**

2019 YEAR IN REVIEW





“Whether it’s upholding our commitment to environmental cleanup, enhancing national security, or advancing American-made energy, the Department of Energy has adopted a modern mindset driven by innovation as we complete missions and look to the future.

Significant progress has been made in the treatment and disposal of nuclear waste, as well as in positioning the EM program to achieve success in the years ahead. As we close out the 30-year anniversary of the largest environmental cleanup program in the world, the EM team is focused on safely and effectively advancing its mission at the best value for American taxpayers.”

—*Dan Brouillette, Secretary, U.S. Department of Energy*



“The Department of Energy has an unwavering dedication towards honoring the past, securing our present, and continuing progress that has been made over the last 30 years in environmental cleanup. As we continue down the path of safe and efficient environmental management, DOE looks forward to creating and developing innovative cleanup approaches and using all of the scientific capabilities at our disposal.”

—*Paul Dabbar, Under Secretary for Science, U.S. Department of Energy*



“Thanks to EM’s highly skilled workforce and the demonstrated commitment of DOE leadership to the cleanup mission, forward progress is being achieved at every EM site. With landmark tank waste treatment systems poised to begin operations, EM is approaching a turning point that will translate into historic risk reduction and opportunities for expedited cleanup across the complex. As meaningful progress continues in the year ahead at all sites, EM will focus on driving cleanup toward completion in a safe and sustainable manner.”

—*William “Ike” White, Senior Advisor for Environmental Management to the Under Secretary for Science, U.S. Department of Energy*

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TERMS & ACRONYMS

AMWTP: Advanced Mixed Waste Treatment Project

ARP: Accelerated Retrieval Project

ARP/MCU: Actinide Removal Process/Modular Caustic Side Solvent Extraction Unit

CH: Contact-Handled

DOE: U.S. Department of Energy

DFLAW: Direct-Feed Low-Activity Waste

DUF6: Depleted Uranium Hexafluoride

D&D: Deactivation and Decommissioning

EM: Office of Environmental Management

EM-HQ: Office of Environmental Management Headquarters

EM-LA: Office of Environmental Management Los Alamos Field Office

EPA: U.S. Environmental Protection Agency

ETEC: Energy Technology Engineering Center

ETTP: East Tennessee Technology Park

FY: Fiscal Year

IWTU: Integrated Waste Treatment Unit

LANL: Los Alamos National Laboratory

LAW: Low-Activity Waste

LBNL: Lawrence Berkeley National Laboratory

LLNL: Lawrence Livermore National Laboratory

LLW: Low-Level Radioactive Waste

MLLW: Mixed Low-Level Radioactive Waste

MPF: Mobile Plutonium Facility

M&O: Management and Operating

NEPA: National Environmental Policy Act

NNSA: National Nuclear Security Administration

NNSS: Nevada National Security Site

NRU/NRX: National Research Universal/National Research Experimental

ORNL: Oak Ridge National Laboratory

OSWDF: On-Site Waste Disposal Facility

PFP: Plutonium Finishing Plant

PPPO: Portsmouth/Paducah Project Office

PUREX: Plutonium Uranium Extraction Plant

RH: Remote-Handled

ROD: Record of Decision

SDA: Subsurface Disposal Area

SDU: Saltstone Disposal Unit

SHPO: State Historic Preservation Officer

SPRU: Separations Process Research Unit

SRNL: Savannah River National Laboratory

SRS: Savannah River Site

SSCVS: Safety Significant Confinement Ventilation System

SWPF: Salt Waste Processing Facility

TCCR: Tank Closure Cesium Removal

TCE: Trichloroethylene

TRU: Transuranic

TVA: Tennessee Valley Authority

UAV: Unmanned Aerial Vehicle

UMTRA: Uranium Mill Tailings Remedial Action project

WIPP: Waste Isolation Pilot Plant

WTP: Waste Treatment and Immobilization Plant

WVDP: West Valley Demonstration Project

Y-12: Y-12 National Security Complex

2019 YEAR IN REVIEW

OFFICE OF ENVIRONMENTAL MANAGEMENT

Celebrating 30 Years of Cleanup Progress

For the past 30 years, the Office of Environmental Management (EM) has been working to meet the federal government's legal, moral, and ethical responsibility to address the environmental legacy of defense programs that helped end World War II and the Cold War. In 2019, the EM program celebrated its 30th anniversary, bringing together current and former members of the EM team and the broader cleanup community to mark the progress that has been made and chart a path for the next chapter.

Throughout the history of the EM program, the challenges have been great, but progress has been steady, with the workforce achieving a 90-percent reduction in the active cleanup footprint. Many sites have been cleaned up and closed, transitioning from waste sites to wildlife refuges, wetlands preserves, and job-creating economic development hubs.

The Office of Environmental Management Headquarters (EM-HQ) is focused on enabling every site, large and small, to build upon this record of results and 2019 was no exception. From completing the transfer of highly radioactive sludge away from the Columbia River at Hanford to advancing toward Vision 2020 at Oak Ridge to hitting major waste disposal milestones at the Waste Isolation Pilot Plant (WIPP) to completing the waste processing mission of Idaho's Advanced Mixed Waste Treatment Project (AMWTP) to setting Energy Technology Engineering Center (ETEC) on a positive path forward and more, impactful cleanup progress was achieved across the EM complex.

EM's strong record of results was recognized by the Department of Energy (DOE) at the 2019 Project Management Workshop where Richland Operations Office Director of Projects and Facilities Division Mark French was named DOE's Federal Project Director of the Year for his leadership in the successful cleanup of Hanford's Columbia River Corridor.

Advancing the Tank Waste Mission

With approximately 88 million gallons of liquid waste, the tank waste mission ranks high among EM's remaining challenges. The program is entering a transitional period as final preparations are being made to operate three crucial systems that will enable tank waste to be treated and disposed of in a sustainable, efficient manner.

Throughout 2019, work advanced on the Integrated Waste Treatment Unit (IWTU) in Idaho, the Salt Waste Processing Facility (SWPF) at the Savannah River Site (SRS) and the Direct-Feed Low-Activity Waste (DFLAW) program at Hanford. These systems are game-changers when it comes to EM's ability to treat tank waste and drive down associated risks.

While this work continues in the field, EM-HQ is addressing the broader tank waste challenge with an eye toward safe waste treatment and disposal sooner in a manner that can be sustained until mission completion. With release of the interpretation of the definition of high-level waste in 2019, DOE put forth a responsible, science-driven solution that allows for reprocessing waste to be defined by how radioactive it is, not just how it was made. This new approach could offer more options to address tank waste, which is escalating DOE liabilities, as well as expediting cleanup of EM sites across the country. The focus is on exploring options at SRS, where an initial environmental analysis got underway in 2019.

Contracting Approach That Drives Cleanup Toward Completion

EM has billions of dollars in procurements to award in the near future, representing a significant opportunity to increase accountability to taxpayers using restructured performance incentives and stronger project management.

Through a shift to end-state contracting, EM is enhancing project management by defining the work in segments that are easier to track and accomplish, improving incentives to drive cost and schedule performance, and opening pathways to collaborate with partners on innovative approaches to realize risk reduction and reach completion.

In 2019, EM and its partners obligated \$1.3 billion to small businesses. EM will continue to harness the unique capabilities of America's small businesses under the new model.

A 27-member EM team was honored with a DOE Secretarial Award for their work on the end-state contracting model, and the first contract incorporating this approach was awarded at Hanford in 2019.

Smart Partnerships That Propel Progress, Create Enduring Opportunities

To chart a path for cleanup that best positions EM for the long term, innovative ideas and collaborative approaches are necessary. There are no greater incubators of innovation than DOE's national laboratories. EM is leveraging the world-class scientists and capabilities housed at the Savannah River National Laboratory (SRNL) and other DOE laboratories to maximize resources and use technology to successfully complete the cleanup mission.

EM is also focused on innovative public-private partnerships like the one celebrated in Oak Ridge in 2019 that will accelerate the cleanup mission and provide isotopes crucial for cancer research — all at a cost savings for American taxpayers.

HANFORD SITE

"Our singular focus at DOE Hanford is the safe, effective, and efficient environmental cleanup of the Hanford Site. This first year with a single Hanford Site manager has shown that our two offices are reliant on each other to provide mutual support through effective communications, collaboration, and teamwork. We made tremendous progress in 2019, and we are on track for continued success in 2020."

– Brian Vance, Manager, Hanford Site

HIGHLIGHTS

- Made progress to start treating low-activity tank waste by the end of 2023
- Opened the doors of the Waste Treatment and Immobilization Plant's (WTP) Low-Activity Waste (LAW) Facility for commissioning and welcomed technicians who will bring systems online to start treating tank waste
- Welcomed the first chemists to the WTP Analytical Laboratory, who will ensure waste immobilized in glass meets disposal requirements
- Installed major pieces of processing equipment in the WTP Effluent Management Facility to treat secondary waste from vitrification
- Completed the removal of all radioactive sludge from the K West Reactor Basin and transferred it to safer interim storage
- Finished stabilizing a second waste storage tunnel near the Plutonium Uranium Extraction Plant (PUREX) site
- Began removing highly contaminated equipment and debris from the 324 Building to support future excavation of contaminated soil
- Started retrieving waste from the next series of single-shell tanks
- Resumed demolition of the Plutonium Finishing Plant (PFP) and made safe, steady progress in demolition and debris removal
- Treated more than 2.4 billion gallons of groundwater, removing 90 tons of contaminants and shrinking areas of contamination near the Columbia River

Preparing for 24/7/365 Operations to Start Treating Tank Waste in 2023

In 2019, the Hanford Site took important steps to shift to a 24/7 and 365 days-a-year operations mentality and prepare to treat low-activity tank waste. The DFLAW program made significant progress in its transition from completion of construction to the startup and commissioning phases.

In August, the control center for the LAW Facility at WTP opened its doors for commissioning and welcomed technicians who are bringing treatment systems online. In December, the plant's Analytical Laboratory welcomed its first chemists and equipment that will ensure waste immobilized in glass meets disposal requirements. Throughout the year, workers installed major pieces of processing equipment in the plant's Effluent Management Facility that will treat secondary waste from vitrification in WTP.



The entire site is supporting a shift to 24/7 operations to treat tank waste, including workers building the Effluent Management Facility for treating secondary waste from vitrification.

The entire site is supporting the tank waste treatment mission and is making the shift to a new pace of work to support around-the-clock operations. Workers are modernizing utilities and support facilities. Last year, they completed key infrastructure projects, including constructing and upgrading roads that will be used to transport canisters of treated waste to the site's nearby disposal facility.

Eliminating Significant Risks Ahead of Schedule and Under Budget

On October 1, Hanford's past, present, and future were on display as elected officials, tribal representatives, regulatory personnel, and stakeholders joined the Department, contractors, and workers near the Columbia River to celebrate the completion of transferring highly radioactive sludge from the K West Reactor basin to safe storage in the center of the site. The sludge transfer, which was completed three months ahead of the Tri-Party Agreement milestone and under budget, removes another risk to the river and the community, and puts the Department on a clear path to reducing annual operating costs and ultimately "cocooning" the last two Hanford reactors.



The project to move highly radioactive sludge from an aging reactor spent fuel basin to safe, interim storage was completed ahead of schedule and under budget in October 2019.

Progressing Risk Reduction Work Safely and Efficiently

Throughout 2019, one of the site's most critical risk reduction efforts continued at PFP. In the past year, workers removed large sections of the main processing building.



The skyline at the Hanford Site changed for the better as workers safely leveled the main processing facility at PFP.

Enhanced safety controls, such as expanded radiological control boundaries and monitoring, have proven effective in protecting workers, the public, and the environment since demolition work resumed in September 2018. By early 2020, the facility that historically produced nearly two-thirds of the nation's plutonium is expected to be safely leveled. In 2020, the final activities to complete the project will include packaging and safe disposal of the rubble from the plant's demolished Plutonium Reclamation Facility, core sampling soil beneath the building pads, and stabilizing the site with soil cover.

In April 2019, crews finished stabilizing the second waste storage tunnel next to PUREX, eliminating a risk of tunnel collapse and potential spread of contamination. The use of engineered grout stabilized the tunnel without precluding future decisions for disposal of the contents in both PUREX tunnels.

Also, workers began retrieving waste from the next series of single-shell tanks with the start of waste retrieval from Tank AX-102. Workers designed a new strategy to increase the efficiency and rate of retrievals. By installing tank infrastructure needed for retrieving waste from multiple tanks, workers can switch to another tank if they encounter an issue. Crews are working at a safe and deliberate pace to ensure site personnel, the public, and the environment are protected.



Commissioning technicians opened the control center for the LAW Facility at Hanford that will begin treating tank waste by the end of 2023.

The Soil and Groundwater program once again exceeded annual goals for volume treated and contamination removed and reduced the areas of contamination near the Columbia River. In 2019, workers treated more than 2.4 billion gallons and removed 90 tons of contaminants. With each passing year, the program's innovations are improving the efficiency of treatment systems.

Building on Measurable Progress to Achieve Future Successes

In the next four years, the site will build on the measurable progress that's been made at Hanford. Workers will start treating low-activity tank waste in around-the-clock operations by the end of 2023. They will also finish demolishing facilities and stabilizing waste sites at PFP and other former production facilities, clean out the Reduction-Oxidation chemical reprocessing plant, and retrieve waste from six single-shell tanks. The site is engaged in a great public work effort that rivals the nation's former production mission and will continue to build on the experience of many decades of successful work as cleanup moves forward.

SAVANNAH RIVER SITE

HIGHLIGHTS

- Started two general plant projects to expedite removal of materials from K Area to WIPP
- Completed surveys in Building 235-F following deactivation, making progress toward the facility going “cold and dark”
- Deactivated, decommissioned, and demolished a railroad cask car facility, bringing the number of deactivated and decommissioned structures at the site to 292
- Completed the four-year National Research Universal/ National Research Experimental (NRU/NRX) reactor spent nuclear fuel campaign
- Downgraded HB-Line to a Category III facility
- Ended the 11-year Actinide Removal Process/ Modular Caustic Side Solvent Extraction Unit (ARP/MCU) demonstration, making way for commissioning of the SWPF
- Completed commissioning process and performance tests at the SWPF using a salt waste simulant, solvent, and other processing chemicals
- Completed required testing at SWPF that supports the contractor’s preparation for both the contractor and DOE Operational Readiness Reviews that are the next steps towards startup
- Completed removal of Tank 10 bulk waste ahead of schedule
- Launched the Tank Closure Cesium Removal (TCCR) project, decontaminating more than 200,000 gallons of salt waste
- Continued the SRS environmental cleanup mission using innovative methods such as low-cost solar-powered vapor extraction units and using silver chloride to immobilize radioactive iodine in the soil

“The Savannah River Site team continuously looks for safer and more efficient ways to do business. Our site safety awards, safety rates, innovations, and annual cost savings during 2019 are indicative of the employee culture at SRS.”

– Mike Budney, Manager, Savannah River Operations Office

Bringing Innovation to Materials Management and Cleanup

SRS and its management and operating (M&O) contractor exceeded their commitments in 2019. H Canyon and L Basin continued to receive and process uranium materials. The four-year NRU/NRX reactor spent nuclear fuel campaign was completed. The NRU/NRX reactor spent nuclear fuel was from the Canadian Nuclear Laboratory and is longer and heavier than the typical fuel handled at SRS. This required modification of some receipt and transfer facilities at the site. The site completed travel path modifications in L Area Disassembly Basin to allow movement of spent nuclear fuel vertically instead of horizontally, which will realize a 25-percent efficiency gain for cask processing. The M&O contractor managed 51 projects valued at \$341 million and identified \$120 million cost savings that allowed for investment in other projects such as road work, new roofs, facility refurbishment, cybersecurity upgrades, and new facilities in K, L, and E areas.

Additionally, the site continues to use innovative solutions to make progress in environmental cleanup. SRS completed construction of a water-permeable wall, made from recycled iron filings, to treat contaminated groundwater. The site excavated and disposed of 29,000 tons of soil and ash material and established land-use controls for more than 25 acres in Carolina Bay

near the site's decommissioned P Reactor. The site also restored the G Area oil seepage basin to residential standards by filling it with 1,400 tons of stone and 7,000 yards of dirt before capping it with grass.



SRS made progress toward the “cold and dark” deactivation of the 235-F facility, parts of which were once used to manufacture plutonium pellets for the NASA space program.

Advancing the Liquid Waste Mission

The SRS liquid waste contractor completed all physical work, documentation, and reviews for the liquid waste portion of the SWPF project. The liquid waste side is ready for the future operation of SWPF as it gets closer to commissioning. The contractor operational readiness review was completed at SWPF along with a design capacity performance test, confirming that SWPF can process more than 7.3 million gallons of liquid waste per year.



Workers completed construction of a water-permeable iron wall, made from iron filings recycled from automotive engines, to treat groundwater contaminated by solvents in a section of the aquifer beneath SRS.

SWPF uses technology pioneered in the ARP/MCU. ARP/MCU proved the technology used by SWPF and ended its 11-year demonstration this past summer.

The site completed construction on the outer shell of Saltstone Disposal Unit (SDU) 7, its second large-scale saltstone disposal unit. Plans call for seven of the mega-volume tanks to complete the liquid waste mission. Construction is underway on SDUs 8 and 9.

EM, along with federal and state regulators, declared completion of waste removal efforts in Tank 10 ahead of the Federal Facility Agreement scheduled date. More than 200,000 gallons of dissolved salt waste was processed from the tank and decontaminated using the TCCR project started in 2019. TCCR uses removable ion exchange columns with a specially developed resin to remove cesium from the liquid waste. The treated waste is sent for permanent disposal at the site's Saltstone Disposal Facility.

SAVANNAH RIVER NATIONAL LABORATORY

HIGHLIGHTS

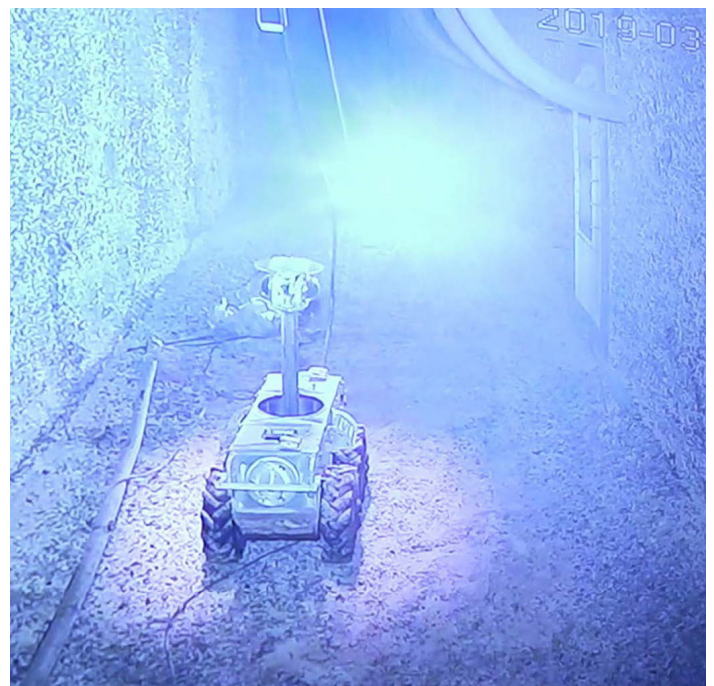
- Completion of SRNL-led analysis of treatment options for Supplemental Low-Activity Waste at the Hanford Site
- Enhanced remote inspection of subterranean radiological exhaust tunnel for structural integrity
- Introduced streamlined mobile facility for rapid recovery of nuclear materials from foreign weapons programs
- Deployed remote aerial surveillance and remediation of entombed reactor buildings

An SRNL-led team of technical experts from six national laboratories completed its two-year effort and issued its “Report of Analysis of Approaches to Supplemental Treatment of Low-Activity Waste at the Hanford Nuclear Reservation” in October 2019. The National Defense Authorization Act for Fiscal Year (FY) 2017 called for the study to assess options for treating and dispositioning the approximately 54 million gallons of existing and projected liquid radioactive waste at the Hanford Site that cannot be treated and solidified by the currently planned treatment systems without extension of processing and tank storage durations. The study evaluated the risks, obstacles, benefits, costs, years needed before startup, and regulatory compliance of three treatment methods —vitrification, grouting, and steam reforming—with on-site or off-site disposition of the final waste forms to provide decision-makers the information they will need to select the treatment technology.

Enhanced Remote Inspection of Subterranean Radiological Exhaust Tunnel for Structural Integrity

Incorporating lessons learned from previous years’ inspections, SRNL has developed and adapted remotely-operated tethered vehicles since 2003, called “crawlers,” to inspect the structural integrity of

the 1,000-foot-long H Canyon Exhaust Tunnel, parts of which are over 60 years old. H Canyon at SRS is the only operating, production-scale, radiologically-shielded chemical separations facility in the U.S. The H Canyon Exhaust Tunnel contains and directs the exhaust air flow from canyon processes to the sand filter system, which removes radionuclide particles prior to release of the air to the environment. SRNL’s 2019 H Canyon Exhaust Tunnel crawler design demonstrated increased terrain handling capability, greater range of camera motion to enable inspection of previously inaccessible areas, and increased resolution of the captured imagery. The 2019 inspection also was the first time two crawlers were deployed simultaneously, enabling a more thorough, end-to-end tunnel inspection. EM has also put crawlers to use for applications at the Hanford and Portsmouth sites.



SRNL tethered robotic crawler inspecting H Canyon Exhaust Tunnel at SRS.

Streamlined Mobile Facility for Rapid Recovery of Nuclear Materials from Foreign Weapons Programs

In October, SRNL rolled out the Mobile Plutonium Facility (MPF) “Lite,” a modular, self-sufficient system that can be rapidly deployed to recover nuclear materials from foreign weapons programs more nimbly and efficiently than SRNL’s original MPF. The MPF Lite reduces transportation constraints, increases system capacity and throughput, and eliminates refurbishment costs. The old system’s glovebox modules’ weights made transportation difficult, requiring specialized handling equipment and assembly procedures that increased risk and reduced mobility. The former system was also constrained by its furnace size, which limited throughput, prolonging processing time.



Mobile Plutonium Facility “Lite” Module.

Aerial Surveillance and Remediation of Entombed Reactor Buildings

SRNL has employed unmanned aerial vehicles (UAVs) as a more efficient and less expensive method to locate and eliminate potentially damaging vegetative growth on the entombed reactor buildings at SRS. The successful entombments completed in 2011 of the P and R nuclear production reactor facilities were the first in the DOE complex and the largest nuclear facility in-situ decommissioning achievements in the world. A long-term maintenance plan ensures the integrity of the entombed structures over time. SRNL remotely captured high-resolution, close-up video of the rooftops of the entombed reactor buildings using a commercial UAV, providing a more thorough inspection than was possible by a helicopter crew and site photographer, at half the cost. SRNL also partnered with Virginia Polytechnic University to build a special hexacopter equipped with a targeted herbicide spray apparatus to treat unwanted vegetation on the rooftops of the reactors.



Unmanned aerial vehicle view from above an entombed reactor building at SRS.

WASTE ISOLATION PILOT PLANT

"We made critical updates in improving WIPP's infrastructure in 2019. The construction of the new underground ventilation system is well underway, and after state regulatory approval, we will be ready to begin construction of the new utility shaft. Numerous other facility and infrastructure improvements will ensure WIPP is poised to dispose of our nation's transuranic waste for years to come. We are making great progress, and through it all, safety will remain the cornerstone for all that we do at WIPP."

– Kirk Lachman, Deputy Manager, Carlsbad Field Office

HIGHLIGHTS

- Celebrated 20-year anniversary of site operations
- Achieved progress on vital capital improvement projects
- Safely received and emplaced up to 10 shipments per week
- Battery-electric equipment put into use underground
- Resumed acceptance of remote-handled (RH) transuranic (TRU) waste shipments
- Received first TRUPACT-III shipment in six years

WIPP's 20-Year Anniversary

WIPP celebrated its 20-year anniversary. The first shipment to the nation's only deep geologic repository for nuclear waste entered WIPP's gates on March 26, 1999, to the cheers and applause of hundreds who had gathered to celebrate the long-awaited occasion. TRU waste began accumulating at Manhattan Project sites in the 1940s with the beginning of the nation's nuclear defense program. As early as the 1950s, the National Academy of Sciences had recommended salt deposits, such as those in southeastern New Mexico, for the permanent disposal of radioactive waste. The 20th anniversary was celebrated with a community ice cream social held on the local courthouse lawn, and a formal dinner for invited guests.

Progress on Vital Capital Improvements

Significant progress was made in 2019 on the largest capital improvement projects at WIPP since its initial construction. This includes the Safety Significant Confinement Ventilation System (SSCVS), which will be the largest containment fan system in the DOE complex and will significantly increase airflow underground. Work on the system's three major facilities has included subsurface excavation, concrete pours, installation of steel components, and laying of utilities. Work also got underway on a new utility shaft. The 30-foot-diameter shaft will descend 2,200 feet, and will be the largest at WIPP, providing air intake for the SSCVS. Additionally, the site began paving an on-site bypass road that will relocate busy area oilfield traffic away from the WIPP site.



A blue pipe marks the spot where WIPP's largest shaft, the 30-foot diameter utility shaft, will be sunk 2,200 feet to the WIPP underground. Crews are routing power from a commercial substation on the east side of WIPP to the utility shaft site on the west side.



With its 24-section slab poured, wall support work has begun at WIPP's Salt Reduction Building.

Safely Receiving Up to 10 Shipments Per Week

Waste shipments to WIPP have continued to progressively and safely ramp up after the resumption of shipments in 2017. In 2019, a waste emplacement milestone was reached when Room 5 in Panel 7 was filled. Three rooms remain to be filled in the panel. WIPP's underground waste disposal panels contain seven rooms each, with each room measuring approximately 13 feet high, 33 feet wide, and 300 feet long.

Battery-Electric Equipment in Use Underground

The first battery-electric load-haul-dump machine was put into use underground in 2019, as part of an initiative to move to a predominantly battery-electric fleet of vehicles. This is possible because of improvements in battery technology in recent years. For worker health and safety, diesel equipment use has been restricted underground as reduced airflow results in air quality issues. Battery-electric equipment allows for needed work to continue underground without these restrictions.



WIPP's first all-electric vehicle, a load-haul-dump, is already working in the underground. Its batteries are recharged from an underground power station.

Resumption of Remote-Handled Transuranic Waste Shipments

RH TRU waste shipments to WIPP resumed. The first two shipments arrived from Argonne National Laboratory-East in Illinois, with each shipment consisting of shielded containers holding the waste. Shielded containers are lead-lined, allowing for RH TRU waste to be safely transported, stored, and disposed of using the same methods as those for contact-handled (CH) TRU waste. The majority of waste received at WIPP is CH TRU waste, which can be safely handled without special shielding.

First TRUPACT-III Shipment in Six Years

In 2019, WIPP accepted its first TRUPACT-III transportation container holding waste in six years. The shipment originated at SRS. The TRUPACT-III allows DOE waste generator sites to package and ship large-sized waste—which would otherwise have to be broken down into smaller waste boxes—in a single box inside the TRUPACT-III, thus reducing worker exposure and risk. This waste includes contaminated glove boxes, used motors, and large-scale analytical equipment.

IDAHO CLEANUP PROJECT

"The completion of contact-handled transuranic debris waste treatment at the Advanced Mixed Waste Treatment Project, and targeted waste retrieval operations at the Accelerated Retrieval Project VII facility are the result of a year of great progress. Completing these activities greatly reduces risks to the Snake River Plain Aquifer and represents DOE's ongoing commitment to the 1995 Idaho Settlement Agreement and the State of Idaho."

– Connie Flohr, Manager, Idaho Cleanup Project

HIGHLIGHTS

- Completed the mission at the AMWTP
- Treated some of the most challenging waste types at AMWTP and the Accelerated Retrieval Project (ARP) VII facility
- Finished the largest buried waste exhumation project at the ARP VIII facility
- Completed the final design of a landfill cover for the Subsurface Disposal Area (SDA) four months ahead of schedule
- Transferred spent nuclear fuel from the Idaho Nuclear Technology and Engineering Center to dry storage
- Accomplished a demonstration run of the IWTU using waste simulant

In late October, EM completed the TRU waste debris treatment mission at the AMWTP. The facility used both conventional and unique retrieval concepts, high-tech characterization equipment, robotics, automated treatment processes, and a supercompactor to retrieve, treat, and ship above-ground CH TRU and low-level radioactive waste (LLW) from an inventory of 65,000 cubic meters. In addition to processing the TRU waste in Idaho, during its operating life the AMWTP received and treated waste from 15 other DOE sites. An event to recognize the achievements of AMWTP employees was attended by Idaho Gov. Brad Little, Idaho Lt. Gov. Janice McGeachin, EM Senior Advisor Ike White, EM Associate Principal Deputy Assistant

Secretary for Field Operations Jeff Griffin, and others.

During 2019, workers at the AMWTP and nearby ARP VII completed the sizing and repackaging of boxes containing large, highly contaminated debris too large to fit into the AMWTP's boxlines. The boxlines are huge concrete and metal hot cells where containers of radioactive waste can be opened and sorted without exposing workers to hazardous materials inside. Employees performed this challenging work safely and compliantly. AMWTP employees also repackaged extremely high-activity waste in the boxlines, and prepared other waste for disposal at WIPP.

Waste management personnel safely completed Idaho's 500th shipment of TRU waste to WIPP in mid-2019. Those 500 shipments comprised 11,300 drums of waste.

In April, crews completed the exhumation of targeted buried waste at the ARP VIII facility, a 1.72-acre footprint in the west end of the 97-acre SDA. Exhumation at the nearby ARP IX facility began in late summer. That 0.69-acre project represents the last exhumation area under a 2008 agreement among DOE, the State of Idaho and the U.S. Environmental Protection Agency (EPA) requiring that 5.69 acres of radioactive and hazardous wastes be removed from the Cold War-era landfill.



Idaho Gov. Brad Little congratulates an AMWTP employee at an October event to commemorate the completion of transuranic waste debris treatment.

The final design for a landfill cover over the SDA was completed four months ahead of schedule and was approved by DOE, the state, and EPA. The 150-acre cover, consisting of native rocks, soil, and plants, is designed to protect the underlying Snake River Plain Aquifer.

The transfer of U.S. Navy spent nuclear fuel from wet to dry storage was completed in late January. The spent nuclear fuel basin at the Idaho Nuclear Technology and Engineering Center is now 94-percent empty. All fuel must be transferred to dry storage by 2023 to comply with an agreement with the state.

The IWTU, constructed to treat 900,000 gallons of radioactive liquid waste, completed a 50-day demonstration run and successfully converted about 64,000 gallons of liquid simulant into a dry, granular solid. Following extensive testing on an IWTU mock-up, process gas filters at IWTU will be replaced with a more effective ceramic media. Engineers installed technologies to decontaminate the IWTU's processing cells during waste treatment operations. Following all facility modifications, the IWTU will undergo a confirmatory run prior to expected startup of waste treatment operations in late 20202.

The cleanup contractor continued to make significant safety improvements during 2019. Employees surpassed more than 4.7 million hours without a serious injury or lost workday and 1 million hours without a recordable injury. DOE awarded the contractor the Volunteer Protection Program Star of Excellence Award, a significant recognition of the contractor's commitment to safety.



Fluor Idaho employees celebrate the last shipment of Navy spent nuclear fuel from the Idaho Nuclear Technology and Engineering Center.

OAK RIDGE

"The work we completed this year has put our ambitious Vision 2020 goal within reach at the East Tennessee Technology Park and laid the groundwork for major cleanup operations at the Y-12 National Security Complex and Oak Ridge National Laboratory. Our progress is enabling new chapters for former government-owned land, enhancing safety, and supporting DOE's important scientific research and national security missions."

– Jay Mullis, Manager, Oak Ridge Office of Environmental Management

HIGHLIGHTS

- Completed numerous demolitions at the East Tennessee Technology Park (ETTP)
- Continued addressing DOE's largest inventory of high-risk facilities
- Construction underway on the Mercury Treatment Facility
- Ramped up next major cleanup phase at Oak Ridge National Laboratory (ORNL) and the Y-12 National Security Complex (Y-12)
- Removed a significant portion of Oak Ridge's inventory of uranium-233
- Invested in new cleanup technologies
- Prioritized training and development of the next generation workforce

Advancing Toward Vision 2020

Oak Ridge's EM program is advancing toward its goal to complete major cleanup at ETTP by the end of 2020. EM completed numerous demolitions in 2019. The most notable are K-1037, which was the largest remaining building at ETTP, and the Poplar Creek Facilities, which were the last remaining buildings that had supported the former gaseous diffusion enrichment process. Teams also performed significant deactivation inside the K-1200 Complex and began demolishing structures that were once used to develop and test centrifuge enrichment technology. EM has removed 12 million square feet of formerly used, contaminated buildings at the site. Only 750,000 square feet of such buildings remain.

Transforming the former government-owned uranium enrichment complex into a privately owned multi-use industrial park is underway. In 2019, a company announced a planned \$500 million investment to locate on former EM land. Additionally, the K-25 History Center opened in early 2020 to share the site's rich history. EM has also created a 3,000-acre conservation easement adjacent to ETTP for public use.

Addressing DOE's Largest Inventory of High-Risk Excess Contaminated Facilities

Oak Ridge is removing risks and stabilizing a portion of the more than 200 excess, contaminated, and deteriorating facilities not yet scheduled for demolition at Y-12 and ORNL. In 2019, crews retrieved more mercury from old equipment — bringing the total to nearly 10,000 pounds — preventing the contaminant from entering the environment. Crews also prepared five high-risk buildings in Y-12's Biology Complex for demolition. Their teardown is set to begin in 2020, clearing the way for future national security missions. At ORNL, work began to deactivate hot cells and former research reactors in the central campus area. These projects will remove risks and prepare buildings for demolition, opening land for future research missions and providing easier access to a Manhattan Project National Historical Park attraction.

Constructing Vital Infrastructure

EM is laying the groundwork for large-scale cleanup at Y-12. In 2019, EM began constructing the Outfall 200 Mercury Treatment Facility. This vital infrastructure will open the door for demolition of

Y-12's large, deteriorated, mercury-contaminated facilities and subsequent soil remediation, by providing a mechanism to limit potential mercury releases into the Upper East Fork Poplar Creek. When operational, the facility will be able to treat 3,000 gallons of water per minute, and it includes a 2-million-gallon storage tank to collect stormwater. The facility will help Oak Ridge meet regulatory limits in compliance with EPA and State of Tennessee requirements.



Construction began on the Outfall 200 Mercury Treatment Facility, which is vital to large-scale cleanup at Y-12.

Removing Oak Ridge's Inventory of Uranium-233

EM has removed approximately half of the inventory of uranium-233 housed in ORNL's Building 3019, which is the oldest operating nuclear facility in the world. Removing the rest of the highly enriched fissile material is EM's highest priority at ORNL. In 2019, EM began the next major phase of the project which involves processing the remaining inventory into a disposal-ready form. This work was able to begin a year ahead of schedule through an innovative public-private partnership that is saving taxpayers \$90 million and providing unique isotopes from the inventory of uranium-233 to aid in next-generation cancer research.



Through an innovative public-private partnership, Isotek employees are extracting rare isotopes from the uranium-233 inventory that the company TerraPower will use for next-generation cancer treatment research.

Investing in Worker Development Programs for the Next Generation Workforce

Oak Ridge's EM program and cleanup contractor have formed numerous partnerships with academic institutions to develop a strong, skilled workforce to continue safe and successful cleanup. Oak Ridge is achieving this through a variety of programs in secondary education and at community colleges and top universities. Our partnership with the University of Tennessee offers the nation's first nuclear decommissioning and environmental management minor degree. The contractor also sponsored the development of a new associate's degree in chemical engineering at Roane State Community College in Tennessee, and launched an apprenticeship readiness program. To date, all program graduates have become employed as a result of completing that program.

LOS ALAMOS NATIONAL LABORATORY

"In the past year, we were dedicated to reducing the footprint of the chromium plume and reducing chromium levels at LANL's boundary with the Pueblo de San Ildefonso. We have ramped up our TRU shipments to WIPP and have taken the steps necessary to ensure we achieve our goal of removing legacy waste from LANL at a sustained pace. With our continued focus on safety, efficiency, and transparency, we look forward to what we will accomplish in 2020."

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

HIGHLIGHTS

- Completed 18 FY 2019 Consent Order milestones
- Implemented the full Interim Measure for addressing the chromium plume
- Treated 57 million gallons of chromium-contaminated groundwater
- Completed 16 shipments of TRU waste to WIPP
- Completed shipment of 300 cubic meters of low-level waste/mixed low-level waste for offsite disposal

Legacy Cleanup and Waste Management Progress

With a strong and sustained focus on safety, the Office of Environmental Management Los Alamos Field Office (EM-LA) achieved significant progress with its legacy cleanup and legacy waste management mission in 2019. EM-LA successfully completed 18 FY 2019 milestones set under the Consent Order with the New Mexico Environment Department. EM-LA also successfully completed 16 TRU waste shipments to WIPP.

Operating Chromium Interim Measure at Full Capacity

To continue addressing the hexavalent chromium plume in the regional aquifer beneath Sandia and Mortandad canyons, EM-LA's priority cleanup activity, the project team completed the full implementation of the Interim Measure. This involves

extracting contaminated water and injecting treated water to control plume advancement and shrink its footprint. The Interim Measure campaign is now underway along the plume's southern and eastern boundaries.

Along the plume's southern edge, chromium levels decreased significantly at the monitoring well nearest to the boundary between LANL and the Pueblo de San Ildefonso. Latest results at that well showed chromium levels were below state regulatory limits. Field and laboratory studies continue in pursuit of determining a final remedy for the plume.



Data from the monitoring well R-70 is being used to further characterize the eastern edge of the chromium plume.

Cleaning Up Technical Area 21

Technical Area 21 is a former Manhattan Project and Cold War-era complex of buildings that housed plutonium processing facilities where groundbreaking tritium research for energy, environment, and weapons defense took place.

Now, only one building remains — Building 257. In addition to preparing for building demolition, in 2019 the project team cleaned up the landscape and in the process shipped more than 1,400 cubic meters of rubble from Technical Area 21.



The project team prepped Building 257, the last building at Technical Area 21, for demolition.

Shipping Waste Offsite

With regular TRU shipments to WIPP throughout the year, EM-LA set the foundation for getting legacy waste offsite throughout the remainder of its mission. Two nuclear waste remediation process lines were stood up at Technical Area 54's Area G, which will ensure TRU waste continues to be ready to ship, as the schedule permits.



Several TRU waste shipments were made from Area G to WIPP.

PORTSMOUTH/PADUCAH PROJECT OFFICE

“During an eventful year, PPPO personnel were resolute in maintaining safe, efficient and effective momentum that significantly moved critical projects forward for the Portsmouth and Paducah cleanup missions.”

– Robert Edwards, Manager, Portsmouth/Paducah Project Office

HIGHLIGHTS

- At Portsmouth, commencement of pre-demolition activities at the X-326 building began paving the way for full-scale demolition at the site
- Completed Cell 1 liner at the Portsmouth Onsite Waste Disposal Facility (OSWDF) in preparation for first waste placement
- At Paducah, the site received regulatory approval for remedial investigation activities under the C-400 building, allowing characterization of the site’s largest trichloroethylene (TCE) source
- Completion of new Tennessee Valley Authority (TVA) substation will contribute to right-sizing infrastructure for a more efficient Paducah Site

Portsmouth

In 2019, critical progress was made at Portsmouth to prepare for the upcoming demolition and disposal of one of the three large process buildings at the site. Portsmouth is poised to make significant strides in process building deactivation and decommissioning (D&D) over the next few years, marking the first significant skyline change since plant construction.

Critical Path Pre-Demolition Activities Continue

The X-326 process building came one step closer to demolition as deactivation wrapped up. Pre-demolition activities began in 2019, including the construction of the water treatment system, a key safety element in the demolition process.

Key Deactivation Milestones Met

Progress continued on the deactivation of the X-333 Process Building. The building completed over 50-percent of the associated scope to be declared “cold and dark” – a term meaning the facility is isolated from all external sources of hazardous energy – by a March 2021 contract milestone.



At Portsmouth, the X-622-1 Water Treatment System construction in progress will be a key support function for the upcoming X-326 process building demolition.

Strong Momentum on OSWDF

Portsmouth’s OSWDF made significant strides with the completion of the Cell 1 Liner in November 2019. With the placement of the protective layer the OSWDF will be ready for the first waste, emplacement in 2020.



At Portsmouth, Cell 1 Liner of the OSWDF has been completed and will be ready to accept the first waste placement in 2020.

Paducah

At Paducah, deactivation activities continued to prepare the site for future cleanup. DOE is maximizing momentum to characterize and remediate a full “city block” around the C-400 complex, advancing remediation of a major source of contamination at the site.

Strategic Deactivation Activities Continue

DOE is completing deactivation of the C-400 Cleaning Building to set the stage for characterization and removal of the TCE source under the building, the main contributor to groundwater contamination at the site, as well as future demolition of the building.

The site received approval of the Remedial Investigation/Feasibility Study Work Plan for characterization activities to determine nature and extent of the TCE source under the building.

Infrastructure Improvements Facilitate D&D

Construction neared completion on a new TVA substation to provide power needs to the site, removing aging switchyard infrastructure, decreasing costs, removing DOE dependence on infrastructure operations, and positioning the site for a more efficient cleanup.



At Paducah, a new TVA substation will allow the site to right-size utilities for cleanup and provide ancient infrastructure (scrap metal) to PACRO to sell.

Switchyard deactivation will also provide economic benefits to the community by transferring excess scrap metal to the Paducah Area Community Reuse Organization (PACRO) for resale.

DUF6

The Portsmouth/Paducah Project Office’s project to convert depleted uranium hexafluoride (DUF6) to a more stable form continued to successfully run on all seven process lines. The project is currently focused on cylinder management that continues until all cylinders are processed or disposed.

The DUF6 project has converted more than 80,000 metric tons of DOE’s more than 700,000 metric-ton inventory of DUF6 since the conversion facilities were commissioned in 2010. The project has converted more than 15,000 metric tons of the material since the beginning of FY 2018.

NEVADA NATIONAL SECURITY SITE

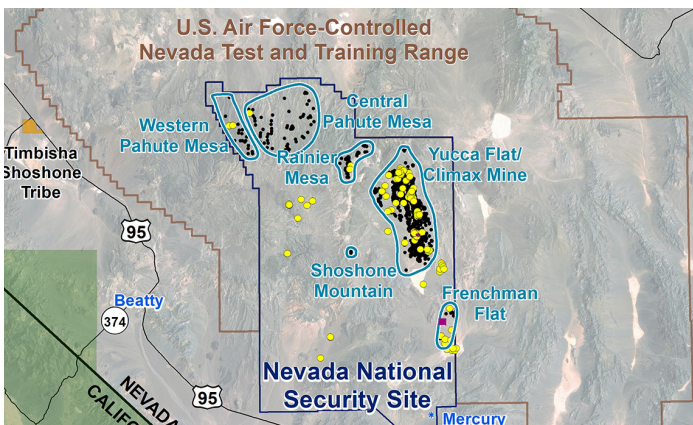
“Significant accomplishments in the Soils and Groundwater programs this year – building on the collective efforts of hundreds of women and men over the last 30 years – have taken the EM Nevada Program to the point where the end of environmental restoration is within sight, and the focus will shift toward planning of long-term stewardship that protects human health and the environment.”

– Rob Boehlecke, Program Manager, EM Nevada Program

HIGHLIGHTS

- Completed cleanup of the last Soils site
- Advanced a groundwater characterization area toward long-term monitoring
- Disposed of 1 million cubic feet of classified and low-level/mixed low-level radioactive waste (LLW/MLLW)
- Maximized capacity of a permitted disposal cell
- Engaged stakeholders through numerous outreach activities

The EM Nevada Program safely achieved several major accomplishments in 2019 at the Nevada National Security Site (NNSS) and on surrounding Air Force-controlled land, including the Tonopah Test Range.



2019 accomplishments include completion of Soils sites, progress toward long-term monitoring of groundwater, and safe and efficient waste disposal.

Under Budget and Ahead of Schedule

Environmental corrective actions and waste shipments were safely completed at the last remaining site where surface/near surface soils were contaminated by a historical nuclear safety experiment. As a result, the Soils project was completed six years ahead of schedule with an estimated cost-savings of \$66 million.



The final waste shipment from a Soils site is unloaded for permanent disposal at NNSS.

Verifying the Long-Term Safety of Groundwater

In 2019, significant progress was made to refine the scientific approach to protect the public from exposure to groundwater contaminated by historical underground nuclear testing. Computer model projections based on decades of hydrogeologic data collection were evaluated with new data and well sampling results from the Yucca Flat/Climax Mine

area. With successful completion and regulatory approval of this evaluation, a formal plan is being prepared to begin long-term groundwater monitoring in the area. Long-term monitoring provides for the continued safety of groundwater resources.

Safe and Compliant Disposal

In 2019, approximately 1 million cubic feet of classified and LLW/MLLW was safely disposed at the NNSS. As part of this effort, crews used a robotic crane hook to maximize the capacity of a permitted cell which allowed for an extra 125,000 cubic feet of MLLW to be disposed before permanent closure. This saved valuable space in the adjacent permitted cell, ultimately reducing overall disposal time and costs.

Dedicated to Transparency

Furthering its commitment to transparency and promoting awareness, the EM Nevada Program engaged in numerous stakeholder interactions in 2019. This included hosting multiple Nevada Site Specific Advisory Board public meetings, intergovernmental meetings, a Groundwater Open House, and site tours. Additionally, more than 3,500 Operation Clean Desert educational materials were distributed to the site’s public reading room, to the Groundwater Open House, and to local schools.



Information was shared on Yucca Flat/Climax Mine Long-Term Monitoring during a Nevada Site Specific Advisory Board meeting.

WEST VALLEY DEMONSTRATION PROJECT

"The safe and deliberate approach to site cleanup continues to be a formula for success in removing legacy risk from the West Valley Demonstration Project. Performing work in a safe, compliant, and environmentally sound manner demonstrates our workforce's commitment to protect one another, the public, and the environment. I am truly proud of their accomplishments, and applaud their due diligence in safely completing high-risk and challenging work."

– Bryan Bower, Director, West Valley Demonstration Project

HIGHLIGHTS

- Completed demolition of four support structures surrounding the Main Plant Process Building at the West Valley Demonstration Project (WVDP), bringing EM's total number of buildings removed at the site to 65
- Finished significant infrastructure improvements, including installation of a new electrical distribution system and natural gas pipeline distribution system; both will support the site's current and future cleanup

Demolition of Support Structures

In 2019, EM, completed numerous high-hazard work activities in the Main Plant Process Building, including the removal of more than 56,000 pounds of asbestos-containing material.

Workers completed demolition of four support structures of the Main Plant Process Building: the Manipulator Repair Shop, Contact Size Reduction Facility, Laundry Facility, and Utility Room Extension Building.

Other WVDP Demolitions

In addition to removing the four support facilities, crews demolished another 15 structures and restored the areas where they were located. These included the Low-Level Wastewater Treatment O2 Pad, North Plateau Pump and Treat System, Waste



Workers at the WVDP use a large excavator with a shear attachment to demolish the Manipulator Repair Shop.

Tank Farm Condensers and Equipment Shelter, Liquid Pretreatment System Building, and Chemical Process Cell-Waste Storage Area structure. The latest demolitions bring EM's total number of buildings removed at the site to 65.

Infrastructure Improvements

Workers also helped safeguard the environment by safely installing interlocking concrete blocks to prevent soil erosion at an inactive disposal area closed years ago. The workforce also completed the installation of a new natural gas pipeline distribution system; and connected to a new 34.5 kV feed line, ensuring safe and efficient utilities to support future cleanup work.

SEPARATIONS PROCESS RESEARCH UNIT

"The SPRU project restored and stabilized sites where historic Cold War legacy facilities once stood. Completing the project reduces long-term surveillance and maintenance costs of a nuclear facility, and eliminated a potential source of groundwater contamination at this site."

– Steven Feinberg, Federal Project Director, Separations Process Research Unit

HIGHLIGHT

- Completed restoration of the former Buildings H2 and G2 footprint. The documentation of cleanup will be finalized and the restored areas returned to the Office of Naval Reactors during 2020

Site Restoration

In 2019, DOE completed field work and site restoration at the Separations Process Research Unit, the site of the former research facility that supported improvements in the chemical separation of plutonium early in the Cold War. The former Buildings H2 and G2 work areas were backfilled and restored. The backfill and grading of the H2 excavation required more than 35,000 tons of imported fill. Once the documentation of cleanup is finalized, the restored areas will be returned to the Office of Naval Reactors. Return of the areas is expected in 2020.



Building G2 prior to demolition.



Restored area where Building G2 stood.



Former Building H2 Footprint.

MOAB URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

"This was a very successful year for the project, accomplishing several major milestones. The team is small in size, but large in stature. Every part of the project is in flux, evolving, pushing itself, looking for better ways to safely clean up Moab and maximize disposal at Crescent Junction. It's an exciting time to be a part of this project. We've set our goals high for 2020. We know what we can accomplish. I have no doubt this team - these individuals - are going to get there."

– Russell McCallister, Federal Cleanup Director, Moab Uranium Mill Tailings Remedial Action Project

HIGHLIGHTS

- Celebrated 10 years of shipping waste from Moab to the Crescent Junction disposal cell
- Reached 10 million tons of waste relocated to Crescent Junction
- Excavated and shipped more than 53,000 tons of debris from the former mill site to Crescent Junction
- The project maintained a focus on Colorado River protection, reaching a milestone of 5,000 pounds of ammonia removed from the site's groundwater
- Efforts to promote revegetation and sustainability continued, providing opportunities for flora and fauna

Ramping Up Production

The Moab Uranium Mill Tailings Remedial Action (UMTRA) Project enjoyed an eventful 2019 in its mission to relocate mill tailings and other contaminated materials from a former uranium ore processing facility in Moab, Utah, to an engineered disposal cell constructed near Crescent Junction, Utah.

In February 2019, the project increased waste shipments from about 9,400 tons to 18,800 tons per week. Residual radioactive material is shipped by rail from the Moab site to the Crescent Junction

disposal cell, about 30 miles away. The project hired an additional 23 people to support doubling residual radioactive material shipments from two to four per week.

Marking the 10-Millionth-Ton Milestone

The project marked its 10-year shipping anniversary in April 2019. In September, the project reached another milestone and commemorated 10 million tons of RRM shipped from the former uranium-ore mill to the disposal cell. In October, DOE hosted a community celebration to recognize the project's progress.



Crescent Junction staff gathers among shipping containers to commemorate 10 million tons of waste relocated from the Moab site to the Crescent Junction disposal cell.

Shipping More than Soil

Shipments of contaminated debris ramped up in 2019. Debris left over from disassembly of the former mill requires special attention before it's transported for disposal because of its large size, jagged shape, and degree of contamination. Over the year, the project shipped more than 53,000 tons of debris to the Crescent Junction disposal cell.



A haul truck approaches the Moab site's gantry crane. The gantry crane loads locked containers on the train's rail cars.

Protecting the Colorado River

The Moab UMTRA site sits adjacent to the Colorado River. The project's efforts to protect the vital water source include extracting ammonia and uranium mass from groundwater underlying the site. In April, the project reached a total of 5,000 pounds of uranium removed from the groundwater since 2003, preventing that contaminant from discharging into the river. More than 934,000 pounds of ammonia have also been removed.

At the Moab site, staff removed invasive plant species and continued to revegetate the land to stabilize and restore it with native plant life. In addition, sustainability efforts reduced water usage, supported honey bees and wildlife, and promoted sustainable vegetation for years to come.



Globe mallow planted by project staff thrives on the Moab site.

ENERGY TECHNOLOGY ENGINEERING CENTER

"The ETEC office had an incredible year to move towards the initiation of final closure. The ETEC site published the Final Environmental Impact Statement late in 2018, executed a Programmatic Agreement, and published a Record of Decision for building demolition. I am very proud of the team's accomplishments and look forward to another challenging year towards environmental remediation and closure."

-John B. Jones, Site Director, Energy Technology Engineering Center

HIGHLIGHTS

- Executed a Programmatic Agreement with the California State Historic Preservation Officer (SHPO)
- Published a Record of Decision (ROD) for the D&D of the 18 remaining buildings at the Energy Technology Engineering Center (ETEC)
- Initiated field work to support future building demolition

Signed Programmatic Agreement with California State Historic Preservation Officer

ETEC completed Section 106 of the National Historic Preservation Act, which requires federal projects to account for the impact of proposed actions with the SHPO. The requirement was executed through a Programmatic Agreement with the California SHPO. This was an agreement that took over five years to complete and allowed the Department to move towards completion of the National Environmental Policy Act (NEPA) process.

A Record of Decision was Published for the ETEC Buildings to be Demolished

ETEC has been working towards completing its NEPA process since 2008 for cleanup of Area IV and the Northern Buffer Zone of the Santa Susana Field Laboratory. The signing of the ROD for building demolition in 2019 was a major accomplishment. Following the issuance of the ROD, DOE has engaged with California state officials on demolition

of remaining DOE buildings at the site. DOE anticipates beginning demolition in 2020, which is an important step forward to final cleanup.



Energy Technology Engineering Center in Area IV of the Santa Susana Field Laboratory.



Energy Technology Engineering Center — Sodium Pump Test Facility.

LAWRENCE BERKELEY NATIONAL LABORATORY OLD TOWN

"It will be a bit more challenging working on three projects in two separate areas this next year, but LBNL has put together a good team. We are looking forward to continued progress in support of the Office of Science mission."

– Kevin Bazzell, Federal Project Director, Lawrence Berkeley National Laboratory

HIGHLIGHTS

- Completed Building 14 deactivation, characterization, and demolition
- Completed Building 4 deactivation and characterization; and demolition is ongoing
- Completed Building 7 characterization
- Completed Bayview Parcel Cleanup Project characterization in preparation for tunnel demolition

The Old Town Demolition Project

The purpose of the Lawrence Berkeley National Laboratory (LBNL) Old Town Demolition Project was to demolish 1940s-era laboratory buildings that were declared seismically deficient, and clean up existing contamination. The overall objective was to demolish the seven remaining Old Town buildings, remove four slabs from buildings previously demolished, remove contaminated soil under and adjacent to the buildings/slabs, and restore the area to a clean and stable site to make available approximately two acres for future DOE Office of Science mission growth.

The project was implemented using a phased approach, and the four slabs and the three building areas were addressed by Phases I – IV and completed previously.

In 2019, the Old Town team completed deactivation and radiological and hazardous materials

characterization of both Buildings 4 (Advanced Light Source [ALS] Support Facility/offices) and 14 (Earth Sciences). The team also completed the demolition of Building 14 and removal of the roof and second floor of Building 4.

The Old Town team completed radiological and hazardous materials characterization of the Building 7 (ALS Shipping and Receiving) accessible areas in preparation for demolition.

Bayview Parcel 1 South Cleanup Project

The Bayview Parcel 1 Cleanup Project includes demolition and removal of the former Bevatron utility tunnels and related concrete slab, grade beams, pilings, and associated contaminated soil; and removal of the demolition debris and soils. All demolition and excavation will be conducted in a manner that will not impact LBNL research operations. The Bayview team completed characterization and is in the process of deactivating the Bayview Parcel 1 South area in preparation for tunnel demolition.



LBNL Old Town - September 2019.

LAWRENCE LIVERMORE NATIONAL LABORATORY

"The team is looking forward to removing high risk excess facilities at LLNL over the next few years to help support the ongoing NNSA mission."

– Kevin Bazzell, Federal Project Director, Lawrence Livermore National Laboratory

HIGHLIGHTS

- Established an EM D&D presence at the National Nuclear Security Administration (NNSA) Lawrence Livermore National Laboratory (LLNL)
- Outlined an approach and plan for tackling high-risk excess facility D&D
- Removed Building 280 ancillary facilities
- Entered into an interagency agreement with the U.S. Army Corps of Engineers to demolish and remove the Building 280 reactor
- Acquisition process is underway to support characterization for Building 175 for future demolition
- Contract is currently being developed to allow for Building 251 to be demolished to slab-on-grade

Building 280 Reactor Removal

This project involves the removal of the Building 280 Livermore Pool Reactor, support equipment, containment building, and ancillary office facilities. Removal of the reactor is considered a high priority because of structural cracks in the reactor concrete shielding.

In 2019, EM utilized LLNL M&O contractor to remove the Building 280 ancillary office facilities, thereby providing laydown areas for future demolition activities.

EM entered into an interagency agreement with the U.S. Army Corps of Engineers (USACE) to demolish the Building 280 Pool Type Reactor. The USACE acquisition process is underway in preparation for commencing activities during FY 2020.

Building 175 Demolition

This project involves characterization and removal of the excess MARS E-Beam Facility and associated ancillary office facility and external equipment. EM is using the LLNL contractor for the 16,600 gross-square-foot Building 175 demolition. The LLNL acquisition process was underway to support characterization and demolition preparation activities in FY 2020.

Building 251 Demolition to Slab-on-Grade

This project involves characterization and removal of the excess Heavy Element Facility and associated external equipment.

EM is developing a nationwide contract to demolish the 31,100 gross-square-foot Building 251 to slab-on-grade as the first task order.

Technical Support

In addition to the building demolition contracts, a technical support contract was awarded to provide technical and administrative services in support of the EM-LLNL Projects.



LLNL Building 280 Area - March 2019.



DOEEEnvironmentalManagement



EMcleanup

