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Cheers to 20 Years and 8 Tanks: EM, SRR Celebrate Major Accomplishments



EM Assistant Secretary Monica Regalbuto, directly left of the Tank Closure Monument, gathers with federal and contractor employees at SRS.

AIKEN, S.C. – [EM Assistant Secretary Monica Regalbuto](#) congratulated employees at the [Savannah River Site](#) (SRS) on May 12 for two significant accomplishments.

EM and liquid waste contractor Savannah River Remediation (SRR) marked 20 years of radioactive operations at the site's Defense Waste Processing Facility (DWPF) and the operational closure of Tank 12, the eighth underground radioactive liquid waste tank closed at the site.

Regalbuto spoke to more than 1,500 federal and contractor liquid waste employees, stakeholders, and other guests to address the accomplishments and recognize the importance of the SRS liquid waste mission.

"SRS has a proven track record of making safe, measurable progress toward tank waste cleanup goals shared by DOE, the State of South Carolina, and the local community," Regalbuto said.

Calling DWPF an "EM workhorse," she said the facility has brought DOE closer to achieving its cleanup goals.

At DWPF, the nation's only operating nuclear waste vitrification facility, tank waste is heated with glass-forming materials and poured into canisters, where it cools to a solid glass form facilitating long-term storage.

The facility has been safely treating high-level liquid waste at SRS since the transfer of sludge waste feed to the facility in 1996. Soon after, the first radioactive canister was poured, and more than 4,000 canisters have been poured since.

Since its startup, DWPF has removed approximately 58.6 million curies, a measure of radioactivity, from SRS liquid waste. The DWPF melter has poured nearly 16 million pounds of molten glass, and the facility has seen only two different melters in its lifetime. Melter 2 has poured more than 10 million pounds of glass and is still safely and efficiently operating, exceeding its design life by more than 10 years.

Dozens of DWPF retirees attended the celebration and were recognized for their dedication to the mission.

DOE-Savannah River Manager Jack Craig said DOE is celebrating outstanding milestones in the SRS liquid waste program spanning 20 successful years.

"DWPF sets the stage for tank closures by removing the most hazardous part of the waste," Craig said. "Now that Tank 12 becomes the eighth closed in 20 years, it may seem routine to close a waste tank. But all waste closures are different, and we're learning from each one."



EM Assistant Secretary Monica Regalbuto, right, and SRR Construction Engineer Ona Alexander place a medallion on the Tank Closure Monument in H Tank Farm, commemorating the operational closure of Tank 12, the eighth underground radioactive liquid waste tank closed at the site.



EM Assistant Secretary Monica Regalbuto rides a shielded canister transporter driven by SRR Operator JD Irons. The transporter carries the 4,000th canister of high-level glassified waste poured at DWPF.



EM Assistant Secretary Monica Regalbuto, left, greets employees and guests at SRS. The SRR team includes lead corporation AECOM along with partners Bechtel, CH2M and BWX Technologies, all of which were present at the event.



EM Assistant Secretary Monica Regalbuto speaks to more than 1,500 SRS federal and contractor liquid waste employees, stakeholders, and guests on May 12 at SRS.



DOE-Savannah River Manager Jack Craig speaks during the celebration.

Waste tank closure is accomplished by filling the entire tank and its component voids with specially formulated grout. SRR workers added more than 900,000 gallons of grout to Tank 12 and its associated systems from January 19 to April 27 this year. More than 550 cement trucks traversed SRS to accomplish this project.

The second tank closed in the SRS H Tank Farm, Tank 12 is an old-style tank, constructed in the early 1950s and placed into service in 1956. It was closed ahead of the May 31, 2016, deadline set in the Federal Facility Agreement between DOE, the U.S. Environmental Protection Agency (EPA), and South Carolina Department of Health and Environmental Control (SCDHEC).

In recent years, employees have pumped waste material from the tank, cleaned it with specialized mechanical and chemical processes, and isolated the tank from all systems. These activities were prerequisites leading to regulatory confirmation that the tank was ready for closure.

Tom Foster, SRR president and project manager, whose first day on the job was May 9, spoke to the audience and echoed the view that the liquid waste work is an important mission.

“Our work keeps our employees safe,” Foster said. “Our work keeps the environment safe. Our work protects our communities. I’m proud to lead a company with these kinds of accomplishments in its record.”

At the celebration, Craig recognized the unique partnership between DOE, EPA, and SCDHEC.

“All of us working together as a team has paved the way to where DOE is now and where DOE will be going,” he said.

There are many layers of regulatory approvals and closure documentation before a tank can be declared operationally closed. Developing partnerships with the outside agencies is an integral part of the tank closure process.

Craig said DOE expects to dispose of the 36 million gallons of radioactive waste remaining in the 43 other waste tanks by retrieving the waste and treating it. This allows DOE to operationally close the tanks at SRS.

“From the evidence you’ve seen, I know we will succeed. DOE’s and our nation’s expectations will be met,” he said to the crowd. “DOE is committed to protecting the workers, the public, and the environment while achieving risk reduction in compliance with regulatory commitments. The continued safe performance of SRS liquid waste operations by SRR employees will continue to reduce that risk.”

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EM Talks Cleanup Progress with State and Tribal Government Working Group



EM and STGWG officials and other participants in the WVDP tour gather for a photo.

NIAGARA FALLS, N.Y. – [Principal Deputy Assistant Secretary Mark Whitney](#) and other [EM](#) officials joined the [State and Tribal Government Working Group](#) (STGWG) here this month for meetings and visits to the Seneca Nation’s Allegany and Cattaraugus territories and the [West Valley Demonstration Project](#) (WVDP).

Representatives from Tribes, states, and organizations that host DOE facilities or are impacted by activities at them comprise STGWG. The working group is focused on key topics such as long-term stewardship, natural resource damages, and Tribal issues with additional interest in transportation planning, nuclear waste and materials disposition, and deactivation and decommissioning activities.

EM’s WVDP Director Bryan Bower and Paul Bembia, the West Valley program director for the [New York State Energy and Research Development Authority](#) (NYSERDA), presented the

EM and STGWG officials with updates on environmental cleanup work at WVDP. Workers also showed cleanup progress during the tour.

“I could not be more proud of this team,” Bower said of site workers. “Keeping safety as their number one priority, workers continue to make progress in the cleanup mission of the site, reaching nearly 2 million safe work hours.”



Left to right, CHBWV President Jeff Bradford, EM Site Restoration Deputy Assistant Secretary Mark Gilbertson, Acting EM Associate Principal Deputy Assistant Secretary Frank Marcinowski, CHBWV Project Manager Dave Brown, and EM WVDP Director Bryan Bower. Five HLW canisters will soon be placed in the storage cask, shown in the background, and relocated to an on-site interim storage pad.

Once the site of the first and only commercial nuclear fuel reprocessing plant in the U.S., WVDP is now an environmental cleanup and waste management project, located about 35 miles south of Buffalo. The cleanup is conducted by EM in cooperation with NYSERDA.

WVDP was the first cleanup project to vitrify high-level waste (HLW) — or convert liquid waste into a glass substance — and place the stainless steel canisters of vitrified HLW into long-term, outdoor interim storage. Once all of the canisters of HLW are transferred from the Main Plant Process Building to on-site storage, demolition of the Vitrification Facility will begin as part of the decommissioning of WVDP facilities.

“The workers have dedicated the past four years working tirelessly to plan, construct, train, and operate the specialized equipment to complete the relocation and storage of the canisters of HLW,” said David Brown, project manager for the HLW Project with contractor CH2M HILL BWXT West Valley (CHBWV). “This project is called the West Valley Demonstration Project, and once again this workforce demonstrated a first-of-its-kind operation.”



Pictured, left to right, are EM Site Restoration Deputy Assistant Secretary Mark Gilbertson, Acting EM Associate Principal Deputy Assistant Secretary Frank Marcinowski, CHBWV President Jeff Bradford, and EM WVDP Director Bryan Bower. The window behind them in the Vitrification Facility shows where remote-handled deactivation activities took place. Deactivation of the facility is more than 90 percent complete, and demolition is expected to begin in spring 2017.

The tour focused on another first — the shipment of the vitrification melter to an offsite low-level waste disposal facility. The U.S. Nuclear Regulatory Commission recently authorized the packaged waste, which weighs 190 tons, for shipment. The melter was decontaminated and

placed into a steel container custom-designed and constructed to meet U.S. Department of Transportation requirements.

Bower and CHBWV President Jeff Bradford accompanied Acting EM Associate Principal Deputy Assistant Secretary Frank Marcinowski and Site Restoration Deputy Assistant Secretary Mark Gilbertson on the tour.

The tour was followed by a meeting with Citizen Task Force members, who discussed concerns about maintaining sufficient cleanup funding and transparency in decision-making.

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Safety Improvements, Project Progress at Hanford Site's Plutonium Finishing Plant

RICHLAND, Wash. – Recent changes in how work crews are deployed at the [Hanford Site's Plutonium Finishing Plant](#) (PFP) have yielded significant improvements in safety performance as [EM's Richland Operations Office](#) and contractor CH2M HILL Plateau Remediation Company continue to make steady progress toward demolition of the plant.

Teams of workers have been redeployed to perform one high-hazard project at a time, with additional oversight, rather than performing multiple high-hazard projects simultaneously.

The [PFP is the largest, most complex plutonium facility that has ever been remediated](#) or will be demolished in the EM complex. Many of the hazards inside the building are gone, including nearly 240 pieces of plutonium processing equipment called glove boxes, hundreds of feet of process and chemical lines, 52 pencil-shaped processing tanks, and more than a mile of ventilation ductwork.

With demolition scheduled to begin later this year, crews are finishing demolition preparations and safely performing some of the most hazardous work across the EM complex.

“The workers' continued focus on safety has been as important as their effort to significantly reduce hazards inside the facility,” said Glenn Konzek, EM deputy federal project director for the PFP closure division.

In 2015, an increase in safety incidents resulted in management changes, additional safety and radiological control oversight, and the re-sequencing of work to ensure the remaining work at PFP can be performed safely by a highly skilled and experienced workforce. These measures led to recent strong safety performance.

“We've seen fewer people getting hurt,” said Hans Showalter, a PFP safety representative for the Hanford Atomic Metal Trades Council. “We're also working better as a team. We're doing a lot of this hazardous work for the first time ever. We've made a lot of progress over the years because management and the workers teamed together to figure out how to do this.”



A worker wearing protective gear prepares a chemical tank inside the Americium Recovery Facility for removal.

A former processing canyon as shown in 2013, when debris from years of production was on the canyon floor.



By 2015, crews had removed debris from the canyon and were cleaning its floor.

Earlier this year, crews applied a protective grout cap to the canyon floor and painted it with a fixative, allowing them to decontaminate the canyon walls.



Crews shifted from doing three simultaneous high-hazard projects to focusing on one job at a time requiring protective suits with air supplied by a compressor. The teams using the suits are among the most skilled at the Hanford Site, and using those suits requires a significant support team. By redeploying the teams, the contractor ensures the most experienced team and support members are available for the given scope.

“We’ve shown we can improve safety and improve performance,” said Tom Bratvold, vice president of the PFP closure project. “Our workforce is motivated, dedicated, and is working together to keep each other safe, and making tremendous progress on this challenging project.”

Since January, [crews finished cutting apart and removing the last of two heavily contaminated glove boxes](#), eliminating one of two jobs at the facility requiring the protective suits. In the coming weeks, they’ll complete the second job: preparing the Americium Recovery Facility for demolition. Once this job is done, the highest radiological hazard demolition preparation tasks at PFP will be complete.

Another crew is making so much progress in cleaning out and reducing contamination levels in a former processing canyon that workers will soon be able to breathe filtered air in that area rather than air supplied via portable air tanks.

Significant challenges remain at PFP, including removing, or preparing to remove during demolition, nearly 8,900 feet of contaminated ventilation duct. Crews are also preparing the site for demolition by installing infrastructure, like temporary power needed during demolition, removing unneeded ancillary buildings to make room for heavy equipment, and preparing for a readiness assessment later this summer, when outside experts will evaluate whether the facility is ready for demolition.

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EM’s West Valley Cleanup Contactor Receives 85 Percent of Available Fee Award



Work is underway in the WVDP High-Level Waste Relocation and Storage Project.

WEST VALLEY, N.Y. – [EM](#) announced that the contractor at its [West Valley Demonstration Project](#) (WVDP) cleanup earned \$250,000, or nearly 85 percent of the available fee award of \$295,495 for the six-month period ending Feb. 29 this year.

In its [award fee determination scorecard](#), EM rated CH2M HILL BWXT West Valley's (CHBWV) safety, health, and quality management as "excellent," and gave a "very good" rating for the company's business and project management and environmental and regulatory strategy. EM noted that the contractor met the majority of the performance goals and objectives for the period.

Each year EM releases information relating to contractor fee payments — earned by completing the work called for in the contracts — to further transparency in its cleanup program.

Once the site of the first and only commercial nuclear fuel reprocessing plant in the U.S., WVDP is now an environmental cleanup and waste management project, located about 35 miles south of Buffalo. The cleanup is conducted by EM in cooperation with the New York State Energy Research and Development Authority.



CHBWV workers prepare a cask to receive five high-level waste canisters.



A worker removes a pipe above a tank in a liquid waste cell.

According to EM's final performance evaluation for CHBWV:

With more than 1.85 million safe work hours, the contractor continued its commitment to achieving safety excellence. CHBWV received DOE's [Voluntary Protection Program](#) Star of Excellence, conducted excellent coordination with off-site emergency responders, implemented an excellent radiological controls program, and continued efforts to enhance the emergency management program.

CHBWV submitted quality and timely contract deliverables, and displayed a continuing commitment to improve cybersecurity. The contractor achieved 93 percent of its fiscal year 2015 strategic sourcing goal — a savings in procurements valued at \$295,000 through use of what's known as an e-sourcing procurement tool. All EM sites set a goal for this initiative every year based on procurements to be performed using the tool.

The contractor's partnering efforts were "excellent," its problem solving and work planning and control were "very good," and its risk management was "good."

Factors that led to the "very good" environmental and regulatory strategy rating included CHBWV's regulatory work activities relative to project implementation, good coordination with DOE staff, and "very strong" liaison work with regulators and stakeholders.

View the scorecard [here](#).

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Senators Tour Sites, Meet with EM Officials



RICHLAND, Wash. – Sen. Ron Wyden (D-Ore.), far right, visited the [Hanford Site](#) on May 5. He met with [EM](#) Principal Deputy Assistant Secretary Mark Whitney (not pictured), Office of River Protection (ORP) Manager Kevin Smith (second from right), and ORP Assistant Manager for Tank Farms Tom Fletcher (not pictured). Also shown are Mark Lindholm (third from right), president of tank farms contractor Washington River Protection Solutions, and David Berick (far left), with Wyden’s office. Wyden visited the site to discuss double-shell tanks and tank vapor concerns during an open press briefing. The senator and his staff later toured several [tank farms](#), learned about available protective equipment, and toured the AY tank farm control room where operators remotely operate in-tank retrieval equipment.



LOS ALAMOS, N.M. – Sen. Martin Heinrich (D- N.M.), center, visited [Los Alamos National Laboratory](#) on May 5. He toured Area G in the afternoon and was briefed on the status of the remediated nitrate salt drums and wildfire management strategies at the laboratory.

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Office of River Protection Prepares for Critical Waste Treatment Plant Testing



Workers remove the old test vessel from the Full-Scale Vessel Test Facility.

RICHLAND, Wash. – [EM's Office of River Protection](#) (ORP) removed a 30-ton stainless steel vessel to make way for a new one to fulfill a critical role in verifying design and performance of the [Pretreatment Facility](#) at the [Waste Treatment and Immobilization Plant](#) (WTP).

The new 35-foot-high vessel, a full-size prototype, is scheduled for delivery to ORP this summer. WTP employees are developing a test plan for it to support requirements verification. Test platform commissioning is expected to begin late this year.

Testing of the old 18-foot-tall vessel ended in December. Workers removed the vessel by connecting it to a crane and lifting it out of a skylight in the laboratory's roof.

The old vessel allowed WTP employees to demonstrate that pulse jet mixers planned for use in pretreatment would work with a range of radioactive waste mixes as anticipated.

"Our recently completed tests demonstrated we can consistently and reliably control these mixers," Pretreatment Area Project Manager Felice Presti said. "We're looking forward to conducting the full-scale testing. Our goal is to construct a safe, effective facility to help treat waste and, ultimately, protect the Columbia River and this community from Hanford waste."

The old vessel enabled ORP to capture data on how the computer controls outside the vessel worked to operate mixers inside the vessel under a variety of tank levels using simulated waste with a low amount of solids. Later tests showed how the mixers performed under a variety of slurry and tank-level conditions, from low to high amounts of solids, using simulants.

In 2012, the testing protocol for the mixers expanded to include studies with full-scale vessels. Previous plans relied on computational models and testing in smaller vessels.

Used in nuclear applications for mixing radioactive liquids, slurries, and sludge for more than 40 years, the mixers contain no moving parts and mix waste by expelling it with compressed air. They are refilled with waste by applying a vacuum pressure.

Vessel testing occurs at ORP's Full-Scale Vessel Test Facility, which houses testing programs for Hanford site projects to help to ensure progress while reducing risk to workers and our environment.

WTP will be the world's largest radioactive nuclear waste vitrification facility and is being designed and constructed by ORP contractor Bechtel National Inc. When complete, it will vitrify most of the 56 million gallons of the country's most complex nuclear waste currently stored in tanks on the Hanford site.

The largest of the four major WTP nuclear facilities, the Pretreatment Facility's interior waste feed receipt vessels will receive waste pumped from the Hanford tanks via underground pipes. In the first pretreatment phase, the waste will be concentrated using an evaporation process. Solids will be filtered out, and the remaining soluble, highly radioactive isotopes will be removed using an ion-exchange process.

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EM Leaders Visit with Children in Day Dedicated to Learning About Cleanup



Team Parent recently hosted the [EM](#) portion of [DOE's](#) "Take Your Daughter or Son to Work Day." Family members of EM employees are pictured with [EM Assistant Secretary Monica Regalbuto](#), far right, and [EM Principal Deputy Assistant Secretary Mark Whitney](#), far left. Team Parent is one of several teams that are part of the "[One EM](#)" community. EM headquarters this year launched its new "One EM" concept — one EM team working toward one EM mission and voice.



EM Assistant Secretary Monica Regalbuto, left, chats with a participant in "Take Your Daughter or Son to Work Day." EM's program was titled, "Build the Future with Team Parent."



Children take part in EM's construction-themed activities. A total of 17 participants — from age 2 months to 18 years old — joined the event to learn more about the cleanup program.



All children participating in EM's program received the Manhattan Project National Historical Park Oak Ridge Site Junior Ranger Book. If they finish the work in the book they can request a Junior Ranger badge. More details are [here](#).

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EM Richland Operations Office Contractor Earns 97 Percent of Available Fee



Workers take apart equipment and prepare it for removal from the T Plant, a decontamination and repair facility where employees treat, verify, and repackage waste.

RICHLAND, Wash. – EM's [Richland Operations Office](#) (RL) issued its [fiscal year 2015 fee determination](#) for Hanford Site contractor CH2M HILL Plateau Remediation Company (CH2M).

Responsible for some of the most challenging work at Hanford, including the demolition of the [Plutonium Finishing Plant](#), removal of radioactive sludge from the [K Area Basin](#), and the safe storage of cesium and strontium capsules, CH2M received nearly \$10.6 million, roughly 97 percent of the fee for which it was eligible.

Each year EM releases information relating to contractor fee payments — earned by completing the work called for in the contracts — to further transparency in its cleanup program.

“(CH2M) has performed exceptionally in the area of small business contracting...(and) has awarded more than \$2 billion in contracts to small businesses since 2008,” according to the fee determination scorecard released by RL.

In its correspondence, RL noted that CH2M did not miss any major [Tri-Party Agreement](#) milestones.

“(CH2M) accomplished a number of the Department of Energy’s Key Performance Goals for Hanford Site cleanup,” according to the scorecard. “The contractor was very responsive to customer needs.”

“We attribute that success to our dedicated workforce and the strong partnership we’ve built with our customer, and we look forward to continuing support of DOE’s mission to clean up the Hanford site,” according to a statement by John Ciucci, CH2M president and chief executive officer.

View the scorecard [here](#).

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Savannah River Site Entities Commit to Collaborate in Partnering Agreement



Members of the partnering team from DOE, NNSA, and SRNS.

AIKEN, S.C. – Officials from [Savannah River Site's DOE](#) and [National Nuclear Security Administration](#) (NNSA) offices and management and operations contractor Savannah River Nuclear Solutions (SRNS) recently signed a partnering agreement to focus on open, candid communication among the three entities to do what is best for the site.

DOE-Savannah River Operations Office Manager Jack Craig, SRNS President and CEO Carol Johnson, and NNSA-Savannah River Field Office Manager Doug Dearolph signed the agreement, committing to a collaboration that promotes consistent coordination to achieve common goals in the best interest of the nation.

“By leveraging our combined nuclear materials knowledge, expertise, and assets, we can continue to create a cohesive and effective team committed to finding innovative solutions to national and international challenges,” Craig said.

The partnering team, with about 40 members from the three entities, committed to working together to communicate as a unified voice for SRS, recognizing partnering and project successes, enhancing stakeholder relationships, and building public trust for nuclear operations.

“Partnerships take time and hard work to cultivate and maintain, but the effort is worth it. By working together, DOE, NNSA, and SRNS can achieve more than working alone,” Johnson said. “The bottom line is that we want to accomplish the mission and vision of the Savannah River Site in the best way possible, especially for our nation's taxpayers.”



DOE-Savannah River Operations Office Manager Jack Craig (left), SRNS President and CEO Carol Johnson, and NNSA-Savannah River Field Office Manager Doug Dearolph sign the partnering agreement.

The team also agreed to deliver high-quality results in an ethical manner for the best interests of DOE and the nation. The agreement states that the team will conduct all activities to provide safety and security for the public, workers, and the environment; honor commitments; minimize surprises; and respond to unexpected challenges with cooperation and professionalism.

Additional goals include team-building and face-to-face meetings to improve trust and establish a partnering behavior model for the entire workforce, and eliminating redundant and non-value added steps and processes in work environments.

The agreement also seeks to improve the priority-setting process, promote transparency and discipline in project management, and ensure all stakeholders at SRS agree to operational changes.

"The better you can understand your partner's perspective on a given situation, the better the likelihood we'll take actions that work in everyone's favor," Dearolph said. "The contract between DOE, NNSA, and SRNS outlines what we plan to accomplish in a specific amount of time; however, partnering is a culture. The partnering agreement conveys how we're planning to operate and accomplish that contract."

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Paducah Site Makes History with First Public Tours



PADUCAH, Ky. – For the first time, EM is conducting guided public tours of its [Paducah Site](#). Shown, participants stop for a picture in Paducah's C-300 Central Control Facility during the recent inaugural community tour. Several tours are being conducted for the public to learn about the history of the Paducah Gaseous Diffusion Plant. All eight tours for 2016 filled up quickly. More information about the tours program can be accessed [here](#).

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EM Transfers Coal to Fuel Economic Development



A front loader dumps a bucket of coal into the first of more than 700 trucks that will be used to transport coal from EM's Paducah Site to buyers.

PADUCAH, Ky. – [EM](#) recently completed transferring ownership of nearly 15,000 tons of excess coal to the Paducah Area Community Reuse Organization (PACRO), which PACRO will use as a revenue stream to support economic development.

The excess coal is a result of the site's [switching from coal-powered boilers to five natural gas units](#) to support site activities and heat offices during winter months. Switching to natural gas allowed EM to avoid costs associated with repairing and maintaining the 60-year-old steam plant and updating the facility to meet current environmental regulations — and in turn allowed the program to address sustainability requirements. The natural gas boilers are also scalable, allowing additional boilers to be added or removed as demand changes.

PACRO sold the coal to a coal distributor. Transportation of the coal off-site is underway and will require about 700 25-ton truckloads. Based on the EM and PACRO agreement, PACRO receives half of the sale's proceeds, and the other half goes back to the U.S. Treasury after offsetting EM's expenses related to the transfer.

"We appreciate the partnership with DOE, and we look forward to receiving surplus assets as they become available for the continued growth and prosperity of the region," PACRO Executive Director Scott Darnell said.

Paducah Mayor Gayle Kaler, who chairs the PACRO board, echoed Darnell's sentiments.

"We're excited to start seeing tangible financial opportunities for PACRO through our collaboration with DOE and the ongoing cleanup activities," she said.

"Working with PACRO on this transfer and on other opportunities in the future will help move us forward in the cleanup of the site, while providing excess assets to support economic development in the community," EM [Portsmouth/Paducah Project Office](#) Paducah Site Lead Jennifer Woodard said. "This is a win-win for DOE and the region."

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Miles of Hanford Site Land Near River Restored During Planting Seasons



A herd of elk pass through the Hanford Site's [100-H Area](#), where revegetation work was recently completed.

RICHLAND, Wash. – EM's [Richland Operations Office](#) (RL) and contractor Washington Closure Hanford (WCH) have cleaned, filled, and planted vegetation over hundreds of former waste sites along the Columbia River in the past decade.

RL and WCH recently finished backfilling more than 3 million tons of clean material to complete cleanup near three former plutonium production reactors. The most recent projects included the D, DR, and H reactor areas and includes converting a gravel pit into a wetland area.

Workers have finished the annual restoration and planting season that started in November 2015. They planted nearly 250 acres with 130,000 shrubs and approximately 7,000 pounds of native seeds — another visible sign of cleanup progress along the river that runs through the 580-square-mile site. Since 2005, the team has planted 2,150 acres with more than 1 million shrubs, 56,000 pounds of seed, and 4,000 trees. WCH also found a way to make backfilled areas look more natural, while also reducing project costs.

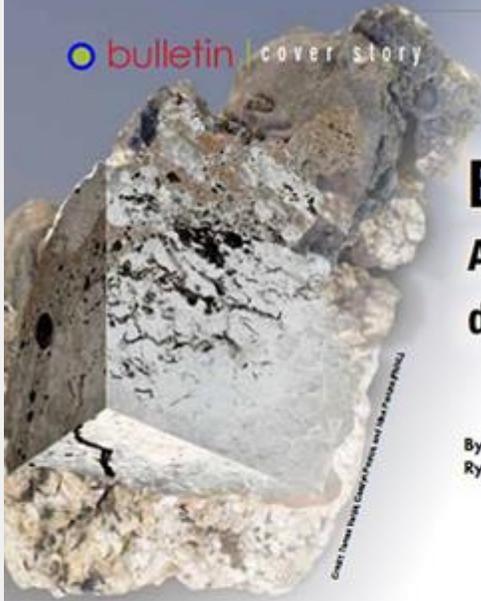
“As part of restoration and planting efforts, we incorporated recontouring, which included placement of boulders and other natural materials, to provide a dynamic ecosystem for wildlife habitat,” said Jeff Lerch, WCH environmental manager. “By doing so, we were able to promote a more natural looking and sustainable habitat for wildlife and save taxpayer money.”

At the N Reactor Area, the team reduced the amount of backfill material needed by not filling excavations to the surface of the surrounding landscape. By contouring these locations, the restoration left the area looking more natural in appearance with valuable habitat for wildlife. This approach, used at many large areas that were revegetated, has benefited birds and other animals.

“I’m extremely proud of our team and the work they have done to restore the environment along the river,” said Lerch. “I grew up in this community and I am honored to have been a part of the team that is restoring the area along the Columbia River so that it can be enjoyed and used safely by future generations.”

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Office of River Protection Scientist Helps Author Cover Story on Glass Study



A sample from the Broburg site in Sweden. Cutaway shows molten areas of the sample; solid areas show unreacted material.

Ensuring longevity: Ancient glasses help predict durability of vitrified nuclear waste

By Jamie L. Weaver, John S. McCloy, Joseph V. Ryan, and Albert A. Kruger

Ancient glass artifacts provide a surprisingly rich source of analogues to study long-term mechanisms of glass alteration for design of new glasses for nuclear waste disposal.

How does glass alter with time? For the last hundred years this has been an important question to the fields of object conservation and archeology to ensure preservation of glass artifacts.¹ This same question is part of the development and assessment of durable glass waste forms for the immobilization of nucle-

to tens of thousands of years. For the past three decades, this community has been attempting to fill this research gap by partnering with archeologists, museum curators, and geologists to identify hundred-to million-year-old glass analogues that have altered in environments (Figure 1) representative of those expected at potential nuclear waste disposal sites. Even with these partnerships, the process of identifying a waste glass relevant analogue is challenging; it requires scientists to relate data collected from short-term laboratory experiments to observations made from long-term analogues and extensive geochemical modeling.

Choosing an appropriate analogue: Initial considerations

When initially approaching the

nuclear wastes are low activity waste (LAW) and high-level waste (HLW). Classification of these wastes is most often based on present radionuclides and regulations regarding how these radioactive elements are immobilized and isolated from the environment. Additionally, researchers further distinguish glasses by their relative elemental concentrations.

For U.S.-based LAW glasses, baseline components are typically ~45 mass% SiO₂ and ~20 mass% Na₂O, mixed with ~6 mass% Al₂O₃, ~9 mass% B₂O₃, and ~20 mass% of other waste-derived oxides. Alternatively, U.S.-based HLW glasses contain ~30–55 mass% SiO₂, ~15–20 mass% Na₂O, ~4–22 mass% Al₂O₃, and ~5–20 mass% B₂O₃, with other oxides comprising the balance, either added in the frit or from

A cover story on EM's ancient glass study appeared in the American Ceramic Society Bulletin.

RICHLAND, Wash. – An EM [Office of River Protection](#) (ORP) scientist contributed to an [in-depth cover story](#) for an [American Ceramic Society](#) publication about how researchers are looking to ancient glass from a [mysterious Swedish hillfort](#) for insight into using the substance to safely store nuclear waste at the Hanford Site.

ORP glass scientist Albert Kruger is one of four authors of the six-page story, "Ensuring Longevity: Ancient Glasses Help Predict Durability of Vitrified Nuclear Waste."

The story focuses on the challenging research problem of studying how glass alters over time. Although ancient artifacts have compositions different from new glasses, the story says, they offer many potential analogues for study. Better understanding of long-term glass alteration allows more accurate prediction of the performance of vitrified nuclear waste to help develop durable waste glasses for millennia, according to the story.

"The ability to benchmark waste-form performance against long-term, real-world behaviors offers an incredible advantage in our treatment and disposal programs," Kruger said. "As we

develop an accelerated aging test for our waste-form, a measure of the validity of the test will be that it predicts the aging identical to that which we found in the hillfort glasses that have aged naturally over more than 1,500 years."

ORP is collaborating with DOE's [Pacific Northwest National Laboratory](#), [Washington State University](#) (WSU), [Luleå University in Sweden](#), Smithsonian Institution's [Museum Conservation Institute](#), and National Historical Museums in the study of ancient glass — how it has fared through the centuries and how it compares to results of accelerated aging tests on various types of low-activity waste.

Funded by EM's International Program, the study is part of a broader initiative to engage in mission-relevant research with countries having common interests.

The story in the May issue of the American Ceramic Society Bulletin features a photo of Jamie Weaver, a WSU doctoral student in chemistry and researcher in the ancient glass study. In the photo, Weaver is shown at the Broborg hillfort near Uppsala, Sweden, close to remains of a vitrified wall that protrudes from the snow. The wall, intended to protect people of a tribe from invaders, was built from melted rocks.

At ORP, workers are building the world's largest radioactive waste treatment plant. When complete, the [Waste Treatment and Immobilization Plant](#) will process and stabilize 56 million gallons of radioactive and chemical waste currently stored at the site. The waste will be immobilized in [glass through vitrification](#).

Read the society's cover story [here](#).

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Hanford Health and Safety Expo Highlights Safety at Home, Work



The Vehicle Crash Demonstration was a powerful look into the potential consequences of distracted or impaired driving.

RICHLAND, Wash. – At the [Hanford Site](#), the commitment to safety extends beyond workers and the job site to the community. Promoting the overall importance of health and safety at both home and work was the focus of the annual [Health & Safety EXPO](#) (EXPO), held in Pasco, Wash., May 9-11. With an average attendance of nearly 40,000, EXPO reaches a large cross-section of the community.

“Completing work safely is the top priority at the Hanford Site, and EXPO allows us to bring increased awareness to the significance of health and safety to the entire community. The EXPO highlights the work Hanford employees carry out every day using good safety techniques and equipment,” said Stacy Charboneau, manager of EM’s Richland Operations Office.

Participants agree that EXPO is a great opportunity to practice and share their safety knowledge with others around Hanford and in the community. Owen Berglund, with Hanford contractor Washington River Protection Solutions, has been part of the EXPO committee since its beginnings 22 years ago. To him, the EXPO exemplified the seriousness of safety in all aspects of life.

One of the most popular and powerful parts of EXPO is the Vehicle Crash Demonstration, created through partnerships with local law enforcement, the Hanford Fire Department, wrecking and towing companies, and volunteer actors who illustrated the potential consequences of impaired or distracted driving.



A high school student learns about the importance of personal protective equipment and safety when working around electricity.

“Knowing that it’s a demo and not real doesn’t diminish how compelling and impactful it is. As a young adult, I know many people who engage in unsafe driving. Participating in a crash demonstration as the ‘victim’ has changed the way I drive,” said Clayton Simundson, an intern with Hanford contractor Mission Support Alliance who has volunteered for the crash demonstration the past two years.

In addition to the major Hanford contractors, health and safety vendors and exhibitors from around the region took part in EXPO. More than 150 booths were featured, many with interactive demonstrations and hands-on activities. Emphasis on science, technology, engineering and mathematics (STEM) education and its important role in health and safety was new this year.

Other highlights of the 2016 EXPO included “Casper” the inflatable colon, through which attendees walked to learn more about colon cancer awareness and prevention; MEGA Lungs,

another walk through, interactive exhibit designed to educate about lung disease and lung health; and a bicycle rodeo to teach children the skills and precautions of safe ridership.

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