

# HANFORD FORWARD

## NEW TECHNOLOGY PROTECTS THE QUALITY OF HANFORD SITE EQUIPMENT

CENTRAL PLATEAU

### Path Ahead for PFP

*Preparing to demolish the most hazardous Hanford site facility*

RIVER CORRIDOR

### Conducting Work Safely is Greatest Accomplishment, Manager Says

TANKS

### Workers Complete Key Milestones at the Hanford Vit Plant



**SPRING 2016 ISSUE**

QUARTERLY PUBLICATION COVERING  
HANFORD CLEANUP NEWS & PROGRESS



# ABOUT HANFORD



**RICHLAND OPERATIONS OFFICE**  
United States Department of Energy

The Richland Operations Office is responsible for cleanup of much of Hanford's waste, including preparing and demolishing the Plutonium Finishing Plant, disposing of contaminated soil and solid waste, and treating groundwater, while providing occupational medical services and configuring site infrastructure for the future.



CH2M HILL Plateau Remediation Company (CH2M) is the prime contractor for the safe, environmental cleanup of the Central Plateau. CH2M's responsibilities include waste retrieval and fuels management, groundwater remediation and demolition of facilities and canyons, and closure of the Plutonium Finishing Plant.



HPMC Occupational Medical Services provides occupational medical services to the Department of Energy and to Hanford employees.



Mission Support Alliance (MSA) is responsible for integrated infrastructure services for the Hanford cleanup mission, including roads and transportation services; electrical and water services; facility maintenance; emergency response (fire and patrol) services; network and software engineering as well as environmental compliance and clean energy solutions.



Washington Closure Hanford (WCH) is responsible for cleaning up waste sites, decontaminating and decommissioning former plutonium production nuclear reactors and surplus facilities, and disposing of contaminated material. WCH is on schedule to complete its mission for the Department of Energy's Richland Operations Office on September 30, 2016.



OFFICE OF RIVER PROTECTION  
United States Department of Energy

The Office of River Protection is responsible for the retrieval, treatment, and disposal of Hanford's tank waste in a safe, efficient manner. The River Protection Project is the largest and most complex environmental remediation project in the nation.



Bechtel National Inc. is responsible for designing, building and commissioning the world's largest radioactive and chemical waste treatment plant. When completed, the plant will be used to solidify the radioactive liquid waste stored in 177 aging underground tanks using a process called vitrification.



Washington River Protection Solutions is responsible for storing and retrieving the approximately 56 million gallons of nuclear and chemical waste stored in Hanford's tanks.



Wastren Advantage, Inc. is the prime contractor responsible for managing the 222-S Laboratory.

TABLE OF CONTENTS

IN THIS ISSUE



**SITEWIDE**

**04 A Legacy of Success in Hanford Cleanup (And Much Work Ahead)**

**CENTRAL PLATEAU**

**06 Path Ahead for PFP**  
 Preparing to demolish most hazardous Hanford Site facility



**RIVER CORRIDOR**

**08 Washington Closure Hanford Completes Extra Work Scope, Saves DOE \$300 Million**

**SITEWIDE**

**10 Restoring and Improving Water and Sewer Systems Across Hanford**

**TANKS**

**11 Workers Complete Key Milestones at the Hanford Vit Plant**



**12 WRPS Receives 'Very Good' Performance Rating From DOE**

**SITEWIDE COVER STORY**



**13 New Technology Protects the Quality of Hanford Site Equipment**

**RIVER CORRIDOR**

**14 "Conducting Work Safely is Greatest Accomplishment," Manager Says**

**TANKS**

**16 DOE Announces Completion of C-102 Retrieval**



**RIVER CORRIDOR**

**17 Hanford Disposal Facility Expanding to Make Room for More Cleanup Debris**





# A LEGACY OF SUCCESS IN HANFORD CLEANUP (AND MUCH WORK AHEAD)

## **RICHLAND OPERATIONS OFFICE NEW VISION**

The Department of Energy Richland Operations Office (DOE-RL), has set the stage for the next decade of cleanup at the Hanford Site. The agency's 2016 Vision maps out how DOE-RL and its contractors will extend their legacy of success during future cleanup work.

In the past year, DOE-RL and its contractors brought the Plutonium Finishing Plant (PFP) closer to demolition, treated a record 2.4 billion gallons of groundwater, and advanced cleanup along the River Corridor at the 618-10 burial ground. Completing cleanup along the river sets the stage for future beneficial uses of portions of the site and increasing controlled access for the public and members of Native American Tribes.

### **RL'S VISION:**

Continuing Our Legacy of Success:  
Cleanup and Protection for the Future.

---

### **RL'S MISSION:**

Protect the workers, public and environment by further risk reduction, provide necessary infrastructure for continued safe and effective cleanup operations, and restore Hanford lands for access and use.



The vision has four tenets:

- 1. Clean Up** – Nuclear facilities and waste sites.
- 2. Protect** – Groundwater and the Columbia River.
- 3. Provide** – Infrastructure to support Hanford cleanup.
- 4. Restore** – Lands for access and use.

Major projects in the next decade focus on reducing and eliminating safety and environmental risks. This work includes completing PFP demolition, moving highly radioactive cesium and strontium capsules from a water-filled storage basin at the Waste Encapsulation and Storage Facility to dry storage, treating groundwater in the Central Plateau, moving 35 cubic yards of radioactive sludge from the K West Basin, and maintaining and upgrading aging and deteriorating infrastructure systems.

Site cleanup has a long way to go because of the extent and complexity of contamination in facilities, the ground and groundwater. Despite the obstacles, Richland’s federal and contractor employees have achieved a legacy of success that favorably positions RL to follow its new vision for cleanup over the next decade and make available more Hanford Site land to its community and tribal partners in the future. \*



K Basin Sludge Transfer	Groundwater Base Operations
Complete Remaining River Corridor Cleanup	Retrieve, Treat, and Enable Shipping of Transuranic Waste to WIPP
Complete Capsule Transfer from the WESF to Dry Storage	Continue Cleanup of the Central Plateau
Complete Infrastructure Upgrades to Accomplish the Site Mission	Initiate Canyon Disposition
Expand Groundwater Cleanup	Restore Hanford Land for Access and Use
Infrastructure and Facility Base Operations	





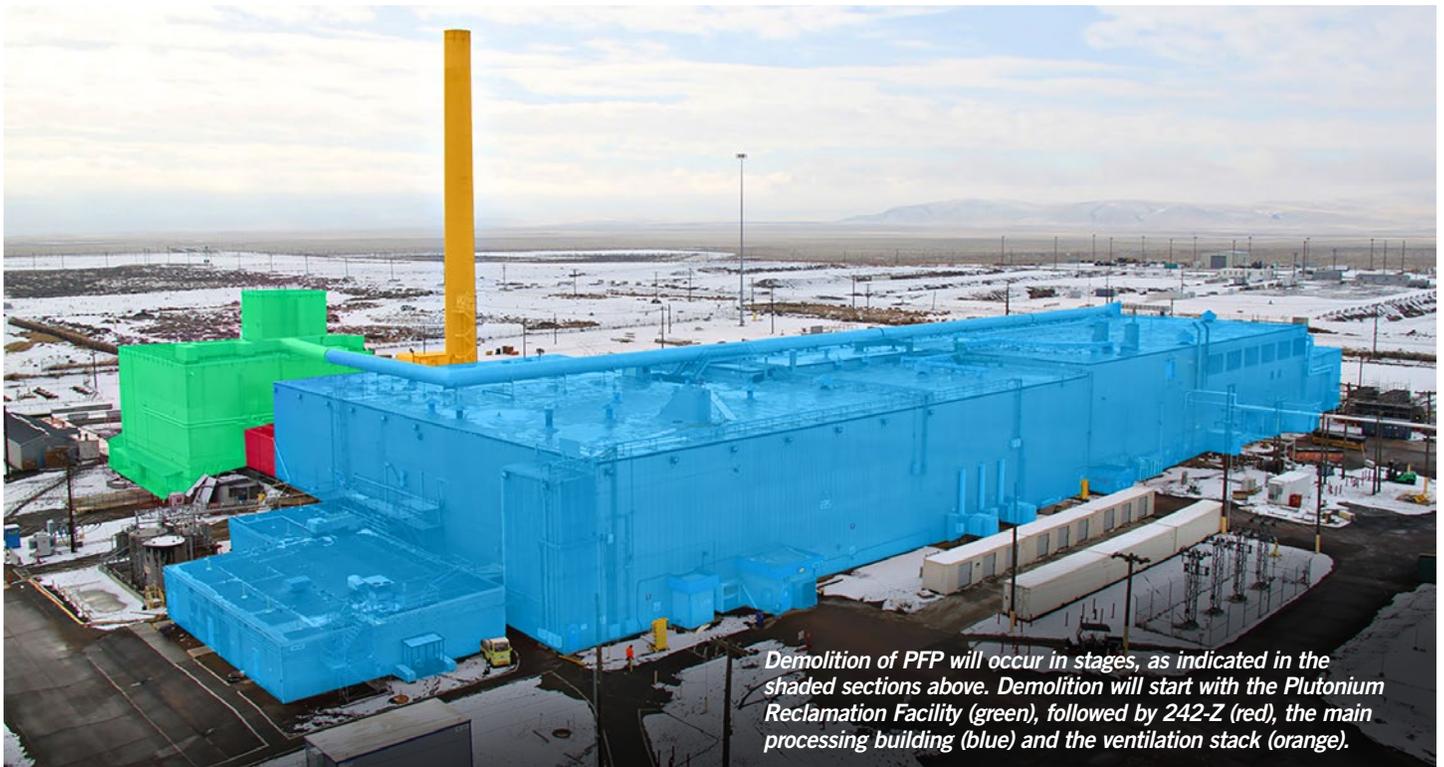
# PATH AHEAD FOR PFP

## Preparing to demolish most hazardous Hanford Site facility

Employees continue to make significant progress toward demolishing the Plutonium Finishing Plant (PFP). PFP is one of the most complex risk-reduction projects, not only on the Hanford Site, but across the U.S. Department of Energy's (DOE) Environmental Management Complex.



While preparing to safely demolish the facility, CH2M HILL Plateau Remediation Company (CHPRC) employees perform some of the most hazardous work across the Complex, including dismantling and removing the largest and most heavily contaminated glove box in February 2016. Crews are now removing the last of the tanks and miles of chemical lines and ventilation ductwork. For 40 years, this infrastructure supported fabrication of plutonium metal "buttons" used in the nation's nuclear weapons.



Demolition of PFP will occur in stages, as indicated in the shaded sections above. Demolition will start with the Plutonium Reclamation Facility (green), followed by 242-Z (red), the main processing building (blue) and the ventilation stack (orange).

“The teams performing this work have a lot of challenges,” said Tom Teynor, project director for the DOE-RL. “We continue to view their collective work, bringing us toward demolition, as the most significant project we have this year.”

Outside the building, preparations are well under way, with smaller support buildings being removed to make room for demolition equipment and waste packages for disposal. DOE is working with regulatory agencies and CHPRC on plans to continuously monitor airborne hazards and weather conditions during the project.

**“TAKING DOWN PFP WILL REMOVE A SIGNIFICANT HAZARD ON THE HANFORD SITE.”**

– **Tom Bratvold, CH2M Vice President of the Plutonium Finishing Plant Closure Project**

“Taking down PFP will remove a significant hazard on the Hanford Site,” said Tom Bratvold, CHPRC vice president of the PFP closure project. “Our dedicated and experienced workforce has made significant progress, and as we begin demolition, we will continue focusing on the fundamentals: performing our work safely and compliantly.”

To ensure the safety of employees and the environment, DOE and the Hanford Site contractors conducted an emergency exercise in late January to test procedures and systems in case of an emergency during demolition. Completing the emergency

exercise is a component of a readiness assessment to evaluate preparedness for the demolition, which will occur in stages.

Heavy equipment will surgically remove the building components, such as glove boxes and ventilation ducts, that are too contaminated and too large to be demolished with the building. Demolition activities will occur primarily during the day, with workers generating only the amount of waste that can be loaded out that night. This will minimize waste buildup and reduce the possibility of contaminant releases. Dust suppression and fixatives will be used to limit airborne hazards. Demolition is expected to take about six months, after which a protective cap will be installed over the footprint of the former structure.

“We all have the same goal – to complete demolition safely,” said Frank Hammitt, PFP radiological control technician. “I have a lot of pride in what I do, and that’s performing cleanup for my community and my kids, who will be here long after I’m gone.” \*





# WASHINGTON CLOSURE HANFORD COMPLETES EXTRA WORK SCOPE, SAVES DOE \$300 MILLION

Washington Closure Hanford’s (Washington Closure) success in cleaning up the hundreds of contaminated buildings and waste sites across Hanford’s 220-square-mile Columbia River corridor has resulted in major cost savings for the U.S. Department of Energy (DOE).

With six months remaining in its contract, Washington Closure has demolished 324 buildings, remediated 573 waste sites and disposed of 11.6 million tons of waste material at the Environmental Restoration Disposal Facility (ERDF), the onsite landfill Washington Closure manages as the repository for most of the cleanup waste.

“We have made tremendous cleanup progress along Hanford’s Columbia River corridor,” said Stacy Charboneau, DOE-RL manager. “The success of this contract can be attributed to the dedication to performance, safety, and quality of the Washington Closure workforce and the DOE team by delivering

this project ahead of schedule and under budget.”

DOE awarded a \$1.9 billion contract to Washington Closure in 2005 to clean up the River Corridor, DOE’s largest environmental cleanup closure project. Since then, Washington Closure has completed nearly \$1 billion in additional work scope while saving DOE more than \$300 million.

**“THE SUCCESS OF THIS CONTRACT CAN BE ATTRIBUTED TO THE DEDICATION TO PERFORMANCE, SAFETY, AND QUALITY OF THE WASHINGTON CLOSURE WORKFORCE AND THE DOE TEAM BY DELIVERING THIS PROJECT AHEAD OF SCHEDULE AND UNDER BUDGET.”**

– *Stacy Charboneau, manager of DOE’s Richland Operations Office*

Washington Closure’s additional work was mainly remediating new waste sites, facilities and buildings during the project.

They also found more extensive contamination in many areas, requiring significantly more remediation than originally planned.

The increase in work scope increased the contract’s target cost to \$2.9 billion. The \$300 million in cost savings are based on the actual cost to perform the work compared to the target cost. Washington Closure achieved the cost savings by



efficiently planning and executing the work, developing more efficient work methods and applying lessons learned as work proceeded.

DOE awarded Washington Closure an additional year to its 10-year contract to continue remediation work, including work on a major waste site – the 618-10 Burial Ground – revegetating remediated waste sites along the river with native plants, and continuing operations of ERDF to support cleanup across the Site.

“The cleanup accomplishments and success of this contract overall are the result of a team approach by our employees, DOE customer, local communities and regulators alike,” said Scott Sax, Washington Closure president and project manager. “We take a lot of pride in knowing we are protecting and restoring the Columbia River.”

The River Corridor team faced many cleanup challenges. Preparing for unknown risks and hazards has been commonplace. For example, workers recovered nearly 100 pieces of spent nuclear fuel from waste sites near the river. They unearthed more drums containing pyrophoric materials than anticipated, recovered more than 600 concrete-lined drums containing highly contaminated liquids and removed unexploded ordinance from a former Hanford firing range. They also discovered several chromium waste sites that reached groundwater at a depth of 85 feet, and contamination beneath a former nuclear research facility.

Despite having to face these hazards and challenges, the River Corridor team has a strong safety record. No recordable lost-day injuries have occurred in the past three years. Washington Closure and its subcontractors reached 6.7 million safe hours in March. \*

## Washington Closure Hanford: Ten Years of River Corridor Cleanup

**2005** 314 Building (Engineering Development Laboratory) demolition

**2006** Waste site cleanup in the 300 Area

**2007** Super cell 9 excavation at the Environmental Restoration Disposal Facility (ERDF)

**2008** 85-foot-deep chromium site near C Reactor

**2009** Revegetation activities in the 300 Area

**2010** Steel over-casings installed at the 618-10 Burial Ground

**2011** N Reactor Powerhouse stack demolition

**2012** N Reactor "cocooning" completed

**2013** Revegetated mile-long trench in 100-K Area

**2014** 337 Building (Technical Management Center) explosive demolition

**2015** Two-million-pound vault arrives at ERDF



Ed Lerma and Chris Morris with MSA Water Utilities monitor the 200 West fire pump flow test.

# RESTORING + IMPROVING WATER AND SEWER SYSTEMS ACROSS HANFORD

In order to support Hanford cleanup operations for the next several decades, it is essential that water and sewer infrastructure meets projected demands. With some of the equipment and facilities nearly 70 years old, Mission Support Alliance (MSA) has experienced a growing backlog of needed corrective maintenance. In fiscal year (FY) 2015, DOE tasked MSA to execute 100 preselected corrective maintenance packages, in addition to the normal corrective maintenance performed on the systems.

This was intended to allow Water and Sewer Utilities (W&SU) to reduce the backlog to a manageable level and focus on performing preventative and predictive maintenance activities.



W&SU closed out a successful year rebuilding and replacing much of the equipment that was either inoperable or at the

end of its useful life. A total of 391 corrective maintenance work packages were completed this year. In addition, more than 1,800 preventive and predictive maintenance packages were performed.

This is an incredible amount of work that could not have been accomplished without the teamwork of W&SU, Maintenance Services and Work Management. Work planners, engineers, environmental, safety and health professionals, and a variety of maintenance craft worked diligently throughout the year to substantially improve the water and sewer infrastructure at Hanford.

Looking forward, W&SU will have another large pull in FY 2016. These corrective maintenance activities are aimed at improving the reliability of the most critical systems at the Hanford Site, to ensure support for cleanup activities. \*

PICTURED AT LEFT: MSA pipefitters perform a water line tie-in for the 200 West Lagoon makeup water.



# WORKERS COMPLETE KEY MILESTONES AT THE HANFORD VIT PLANT

**In 2015, employees at the Hanford Waste Treatment and Immobilization Plant, known informally as the Vitrification or “Vit” Plant, made great strides on plant construction. The plant, which is intended to treat the Site’s radioactive liquid waste, comprises four major facilities. Progress in 2015 focused on the Low-Activity Waste Vitrification Facility or LAW, the Analytical Laboratory and the High-Level Waste Vitrification Facility.**

Workers completed the 30-percent design milestone of the capability to send tank waste directly to the LAW. Completing this review is an important step toward beginning actual construction. In the meantime, work is progressing on LAW components.

Workers installed refractory, or insulating material, in the two 300-ton waste glass melters. Once the facility is operating, low-activity waste mixed with glass-forming materials will be heated to 2,100 °F in the melters, poured into containers, cooled and transported for onsite storage or disposal.

Work neared completion on the Thermal Catalytic Oxidizer (TCO), a major component in the LAW off-gas treatment system. Once completed, the TCO will undergo testing at the fabricator’s facility before being approved for installation.

Analytical Laboratory work has progressed to outfitting the laboratory with equipment and fixtures. Once this is complete, the construction crew will turn the facility over to the startup group, who will ensure all systems are working properly.

At the nearly 600,000-square-foot High-Level Waste Vitrification Facility, workers completed 22 concrete placements for walls and floors.

Several Vit Plant infrastructure systems also are complete.

The construction crew transferred all major systems in two electrical switchgear facilities and a non-radioactive liquid waste disposal facility to the startup group.

Bechtel National, Inc., employees accomplished all this while keeping the Vit Plant one of the safest work places in the Department of Energy (DOE) complex. In 2015, the Vit Plant received DOE’s highest award for safety, the Voluntary Protection Program Star of Excellence. Last year was the safest in the project’s 15-year history.



*An employee welds steel embeds installed on the top of the High-Level Waste Vitrification Facility truck bay*

In a letter thanking employees for their work in 2015, Bechtel’s Project Director for the Vit Plant Peggy McCullough said, “These accomplishments can only occur because all Vit Plant employees are focused on the same goal: building a plant that will safely and efficiently treat the millions of gallons of waste in the tanks.” ❁



*WRPS made significant cleanup progress in fiscal year 2015, including work to prepare the A and AX tank farms for waste retrieval.*

## WRPS RECEIVES 'VERY GOOD' PERFORMANCE RATING FROM DOE

Washington River Protection Solutions (WRPS), Hanford's tank operations contractor, received the Department of Energy's (DOE) rating of "Very Good" in its annual performance report.

In its review, the Department of Energy (DOE) Office of River Protection (ORP) said WRPS "exceeded many of the significant award fee criteria and has met overall cost, schedule and technical performance requirements."

Key accomplishments included the leadership demonstrated in taking over responsibilities at the Effluent Treatment Facility and implementing measures to further protect workers from chemical vapors. DOE also acknowledged WRPS' efforts to integrate work, prepare for completion of the vitrification plant and collaborate with the national laboratories on waste-treatment research.

WRPS was rated in eight categories. It received an "excellent" rating in the tanks system and nuclear safety categories and "very good" ratings in the other six, for an overall rating at the top of the "very good" range.

**"THE WORK WE DO IS CHALLENGING, TO SAY THE LEAST."**

— **Mark Lindholm,**  
**WRPS President**

Successes in fiscal year 2015 included retrieving nearly 300,000 gallons of radioactive and chemical waste from tank C-102, the 14<sup>th</sup> of the 16 single-shell tanks to be emptied in the C Farm.

WRPS also made significant progress in preparing the A and AX farms for waste retrieval; this will begin after the remaining two C-Farm tanks are retrieved. Preparations also were made to start retrieving waste from double-shell tank AY-102.

In addition, WRPS created nearly 2 million gallons of storage space in double-shell tanks for liquid waste by completing four campaigns at the 242-A Evaporator. The evaporator concentrates the liquid waste by removing water, freeing up space to receive waste from single-shell tanks.

"We appreciate the recognition from the Department of Energy for our strong fiscal year 2015 performance and believe it is a direct result of our team's efforts to work safely while making significant progress toward our mission goals," said WRPS president Mark Lindholm. "The work we do is challenging, to say the least. Moving forward, we are actively addressing our opportunities for improvement, and we are committed to improving our performance in fiscal 2016." \*



*Greg Schnaible performs a metal analysis on a grappler.*

# NEW TECHNOLOGY PROTECTS THE QUALITY OF HANFORD SITE EQUIPMENT

**Maintenance and upkeep of Hanford Site equipment, whether it's a crane, fire truck or a canister used to hold spent nuclear fuel, is one of the most important day-to-day tasks in the cleanup effort.**

As the site integrator, Mission Support Alliance (MSA) is responsible for ensuring the equipment is inspected, evaluated and, when needed, properly repaired. All welding must comply with the Hanford Weld Program, which uses various codes and requirements to ensure the weld repair is safe, durable and meets the intended purpose. One of the requirements to ensure a weld meets program requirements is knowing the base metal being welded or repaired. Without this information, any welding could be considered suspect and not code-compliant.

Until recently, MSA would take a piece of the base metal, send it to a lab for final determination and wait for the results.

“Sometimes the repair job would take two to three months while we waited for the manufacturer to identify the material. In several cases, the manufacturer was out of business and required Engineering to determine where to sample the structure, take the sample, and then wait for the lab results,” said Greg Schnaible, MSA senior Quality Assurance engineer.

Taking advantage of emerging technologies, MSA purchased a machine called the Bruker Q4 Mobile (Q4M), an optical emission spectrometer that provides the metal chemistry of structural components within seconds.

“The Q4M has allowed us to greatly improve our efficiency,” said Schnaible. “Instead of waiting to get results back from a lab, we get the results back within seconds, which allows us to get the repair completed much quicker. Our repair team’s goal now is to have the repair done within two weeks or less.”

The Q4M uses a hand-held probe to analyze the chemistry of the metal on the structure itself, with minimal preparation.

“The purchase of the Q4M has and will continue to increase the efficiency and improve the quality of repairs in our Fleet Services maintenance operation,” says David Baie with Fleet Services.

MSA recently provided an evaluation for CH2M HILL Plateau Remediation Company (CHPRC) on the port seals for the multi-canister overpacks, which store the spent fuel rods historically stored in the K Basins.

“The purchase of the Q4M has been an invaluable asset to the Hanford Site,” said Rick Warriner, QA manager for CHPRC. “In this case, it provided us assurance the seals would perform as designed.” \*



# “CONDUCTING WORK SAFELY IS GREATEST ACCOMPLISHMENT,” MANAGER SAYS

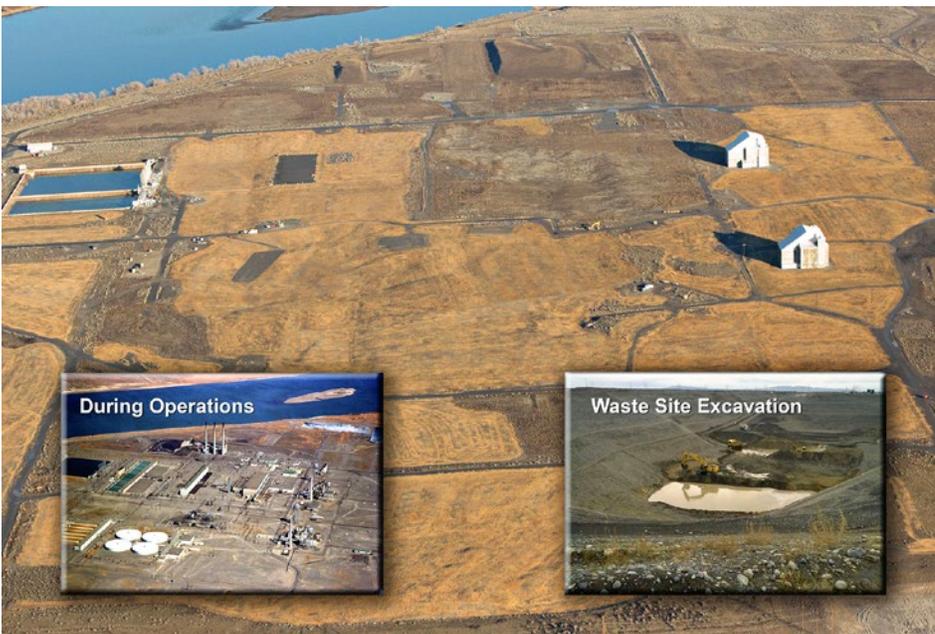
Last winter, Stacy Charboneau marked her first year managing the Department of Energy (DOE)'s Richland Operations Office (RL). RL is responsible for cleanup management and oversight of the 586-square-mile Hanford Site. In her more than 20 years managing Hanford projects involving safety, nuclear operations, construction, environmental remediation, and deactivation and demolition, Charboneau has served as DOE-RL's deputy manager, assistant manager for safety and environment, deputy assistant manager for River Corridor cleanup and facility representative. She recently talked with Environmental Management's *EM Update* about the 2016 completion of the River Corridor Closure Contract with Washington Closure Hanford (Washington Closure). Recognized as the nation's largest environmental cleanup closure project, the contract encompassed hundreds of projects designed to clean up contamination and waste sites near the Columbia River, protecting the river from that contamination, and cocooning or demolishing obsolete structures.

**1. Of all the work that has been done on the River Corridor, what would you say is the greatest accomplishment?**

That's actually a tough question because so much good work has been done on this project. Even though we've successfully cleaned up hundreds of facilities and waste sites in an area larger than the city of Chicago, our greatest accomplishment is that this work was done safely. We accomplished the cleanup of large industrial, radiological, and chemical facilities and waste sites safely — most recently, 6 million hours of work completed without a lost workday due to injury. That's a pretty impressive accomplishment and a testament to the dedication and quality of our workers at Hanford.

**2. How does the successful work DOE has performed on Hanford's River Corridor project better position Richland for cleanup successes in other areas of the Hanford Site?**

Success tends to create a culture of success, which is a good culture for our workers, regulators, and stakeholders to share. It's important that we continue to demonstrate that we can make progress on our large and challenging projects and reduce risk in the EM program. Richland has a substantial amount of cleanup left, and we need to accomplish that work efficiently and cost effectively. Our successes on this project show that we are a good investment. We'll be able to use the credibility and confidence we've built with stakeholders and regulators as we tackle the next cleanup challenges in the Central Plateau.



The inset photo shows the D and DR Reactor Area during plutonium production operations, and the larger image shows an aerial view of the same area today.

**3. More broadly, what lessons can DOE Environmental Management (EM) take from the work done at the River Corridor and apply to other cleanup sites?**

Continuous focus on the work and people, and making sure we are accomplishing that work safely, instead of too much focus on cost and schedule, is a lesson from the River Corridor Closure Project.

One thing that has been different about the River Corridor cleanup is that we started this huge project — a 220-square-mile area — with a strong bias for action. We had early agreements with regulators that, as long as we had enough information to perform work safely and dispose of the waste compliantly, the projects could proceed while being protective of the human health and the environment. For EM, the lessons are having a strong vision with well-defined metrics or success factors, a well-defined end point, flexible plans and good contracting tools.

**4. What role did the type of contract Washington Closure has play in the successful performance of work on the River Corridor? Are there contracting lessons EM could take and apply to other sites?**

The contract we have with Washington Closure is a cost-plus-incentive fee (CPIF) contract. In that kind of contract you do cost sharing with the contractor, so it is important to have a good definition of scope and quantities, built-in flexibilities and understood hazards. It allowed for us to incentivize the contractor to perform work safely and benefit taxpayers. CPIF is a very good tool for completing this work in the most cost-

effective manner. We'll be looking at the success of this contract as we begin the process for the next round of big contracts at Hanford.

**5. You're now looking ahead to the next phase of cleanup at DOE-RL, which is focused on the site's Central Plateau. What are the key projects and activities for this phase of cleanup?**

We have a number of activities and cleanup projects to do in the Central Plateau; first and foremost is completing demolition of the Plutonium Finishing Plant, which is the highest hazard facility at Hanford.

We'll use the knowledge gained as we continue preparing for the demolition of the numerous canyon facilities in the Central Plateau.

We also have cesium and strontium capsules we need to put in long-term, interim safe storage. There are 100 million curies of activity in nearly 2,000 capsules. It's a high-hazard activity.

We will also continue with our extensive groundwater treatment, and expanding the capacities and capabilities of our 200 West Pump-and-Treat Facility. We will prepare T Plant to store the sludge from the 100 K Area. We will continue with safe storage of waste in our Central Waste Complex. As the "landlord of Hanford," we will continue to maintain infrastructure and provide site services, securities and safeguards for the Richland Operations Office and the Office of River Protection. We will also continue planning and actions for expanding future land uses like the newly created Manhattan Project National Historical Park.

We have established a new vision which encompasses all of this work, and we are using this vision to guide our next phase of contract acquisitions. We have a long way to go and many challenges ahead, but we intend to continue demonstrating a legacy of success. \*



*An internal camera shows the view of the tank after retrieval activities were completed.*

## DOE ANNOUNCES COMPLETION OF C-102 RETRIEVAL

Washington River Protection Solutions (WRPS) has completed retrieving the waste from tank C-102, the 14<sup>th</sup> single-shell tank to be emptied at the Hanford Site's C tank farm.



*Cranes remove a sluicer from tank C-102 midway through retrieval to replace it with a new piece of equipment. The sluicer is wrapped in two layers of thick plastic to prevent contamination from entering the environment or harming workers.*

“The completion of waste retrieval from another tank is a reflection of the dedicated workforce at the tank farms,” said Chris Kemp, U.S. Department of Energy, Office of River Protection, Deputy Project director for Tank Farms Retrieval and Closure. “There was substantial effort from the workers to plan, prepare and retrieve this radioactive waste. All of this was done safely while work activities continue at other tanks in the farm.”

Retrieval activities began in April 2014 using enhanced-reach sluicers, tools lowered into the underground tank that spray liquid—mainly recycled waste and high-pressure water—through a nozzle at the end of an extendable boom to break up hardened waste deposits. The resulting slurry is pumped from the top of the tank through a series of hose-in-hose transfer lines to a double-shell tank for storage.

In all, crews removed nearly 300,000 gallons of waste from the tank. Meanwhile, retrieval activities continue in the two remaining C-Farm tanks, C-105 and C-111. ✱



# HANFORD DISPOSAL FACILITY EXPANDING TO MAKE ROOM FOR MORE WASTE

**The U.S. Department of Energy, Richland Operations Office (DOE-RL) and Washington Closure Hanford (Washington Closure) are collaborating on an innovative plan to safely and cost-effectively expand the Environmental Restoration Disposal Facility (ERDF) by vertical expansion: disposing of additional waste on top of the current landfill.**

A 107-acre landfill, ERDF began operations in 1996 and has been expanded horizontally to accommodate disposal needs as cleanup progresses at Hanford. The first eight disposal cells were built in pairs; each cell is 500 feet wide, 1,000 feet long and 70 feet deep. In 2011, ERDF completed construction of super cells 9 and 10, similar in size and capacity to a pair of cells, but built using efficiencies gained from previous cell construction.

Cells 1 through 4 have been filled and are protected with an interim cover, which will be punctured to ensure leachate generated from waste in the vertical expansion infiltrates into the underlying leachate collection system. Cells 5 and 6 are full and cells 7 through 10 are reaching capacity.

ERDF, which contains about 17.5 million tons of waste material, is less than 1 million tons from reaching its current capacity, and would be filled by 2017 without the expansion. The expansion plan calls for raising the top of the waste grade 20 feet.

**“VERTICAL EXPANSION PROVIDES A SAFE, OPTIMUM WAY TO MINIMIZE THE ENVIRONMENTAL FOOTPRINT WHILE SAVING TAXPAYERS MONEY FOR OTHER CLEANUP PROJECTS.”**

**– Bill Borlaug, Washington Closure Lead Engineer at ERDF**

Expanding ERDF vertically instead of using the traditional approach of building new disposal cells will avoid \$30 million in costs, according to Owen Robertson, DOE-RL’s ERDF project engineer. “Vertical expansion is a safe, efficient way to keep the landfill operating and allow Hanford cleanup activities to continue without delay,” he said.

The uppermost surface of the new waste layer will be engineered to form a crown to capture surface water runoff (liquid that has not contacted waste) and will continue to be



**“EXPANDING ERDF VERTICALLY INSTEAD OF USING THE TRADITIONAL APPROACH OF BUILDING NEW DISPOSAL CELLS WILL AVOID \$30 MILLION IN COSTS.”**

*– Owen Robertson, DOE-RL Project Engineer at ERDF*

controlled to minimize contact with waste. Fixatives, vegetative cover, aggregate surfacing, berms, and surface grading will continue to be used to minimize erosion.

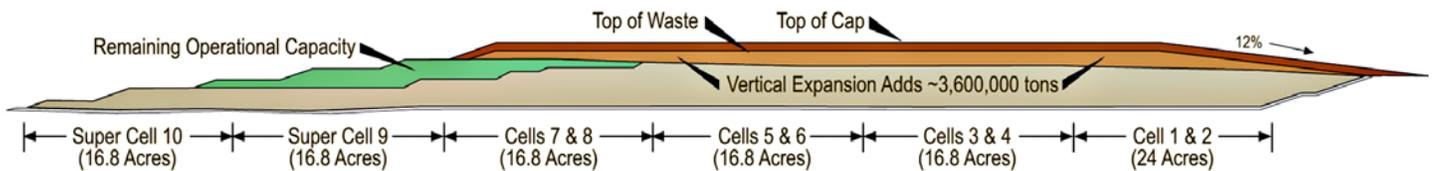
Bill Borlaug, Washington Closure’s lead engineer at ERDF, said vertical expansion will provide space for an additional 3.6 million tons of waste – roughly the equivalent of a super cell.

“We’ve also demonstrated that the existing ERDF liner and leachate collection systems have sufficient strength to accommodate the expansion,” Borlaug said.

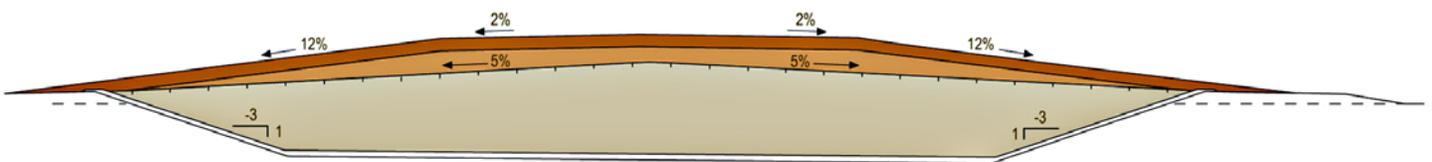
Borlaug began working at ERDF at the beginning of the River Corridor Contract in 2005. Over the years, he has seen a tremendous amount of progress at the massive landfill, in terms of both safety and efficiency.

“I’ve been amazed how well we engage our workforce in finding safe, efficient and compliant ways of doing our work better,” said Borlaug, who spent 15 years in the commercial disposal industry before joining the ERDF team. “Vertical expansion provides a safe, optimum way to minimize the environmental footprint while saving taxpayers money for other cleanup projects.” \*

### East-West Section at Center of Cell



### South-North Section at Center of Cells 9 & 10



*The above illustration depicts a cross section of ERDF, indicating the landfill’s current capacity and vertical expansion, which adds an additional capacity of 3.6 million tons. The bottom illustration shows an end view of ERDF with the vertical expansion and cover.*

- Existing waste in facility
- Waste to be disposed of as part of vertical expansion
- Remaining capacity before vertical expansion
- Landfill cap