Washington Closure Hanford: Cleanup Progress Along the River Corridor

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October 2016
Our Work Scope

Hanford's River Corridor is home to Cold War legacy wastes from nuclear reactors and support facilities dating back to the early 1940s.

- Deactivate, decontaminate, decommission, and demolish 324 facilities
- Clean up and close 578 burial grounds, waste sites
- Treat, transport, and dispose 11.9 million tons of waste debris to disposal facility

Recognized for Safe, Cost-Effective Progress

- Contract extended through 9/30/2016
- Received Project of the Year award from local chapter of the Project Management Institute; one of three finalists for international award
Risks and hazards facing our workers

- High-risk working conditions
- Radiological, chemical, and contamination hazards include chromium, asbestos, beryllium, mercury, and tritium
- Industrial and construction hazards
- Discovery of unexpected waste sites
- High-dose fuel elements and other reactor parts
- Unexploded ordnance
- Pyrophoric uranium oxide (UCO) drums

Success in Project Performance

300 Area

300 Area Cleanup
- Located 1.5 miles north of the city of Richland, close to the Columbia River
- Center of Hanford’s radiological research and fuel fabrication during the Manhattan Project and Cold War
- 173 facilities demolished
- 109 waste sites cleaned up

October 2015
Success in Project Performance
100-B/C Reactor Area

2012

March 2014

100-C-7 Waste Site Cleanup
• More than 120 acres cleaned up; 2.5 million tons of waste material removed
• Revegetated with native bunchgrasses and roughly 52,000 tubelings of three different native plant species
• Using contouring and boulders, backfilling the area with a more natural appearance

Out To See: Visible Cleanup of the River Corridor

Washington Closure Handout: Cleanup Progress Along the River Corridor, September 2014

Success in Project Performance
100-N Reactor Area

2005

April 2015

2013

100-N Cleanup
• 726,000 tons of clean material was used to backfill 98 remediated waste sites
• Revegetated with more than 3,000 pounds of native bunchgrass seed, and approximately 79,000 shrub tubelings planted
• Backfill left the area with more natural appearance, using contouring and boulders

Out To See: Visible Cleanup of the River Corridor

Washington Closure Handout: Cleanup Progress Along the River Corridor, September 2014
**RIVER CORRIDOR CLOSURE PROJECT**

**DOE’s Largest Environmental Cleanup Closure Project**

**Success in Project Performance**

**100-D Reactor Area**

**During Operations**

100-D Area Cleanup
- Have removed what is believed to be Hanford’s primary source of chromium contamination to the Columbia River
- Two major chromium sites completed
- More than 60,000 tons of chromium-contaminated soil was sent to the Environmental Restoration Disposal Facility (ERDF) and treated

May 2016

One Year for Safe, Visible Cleanup of the River Corridor

Washington Closure Hanford. Cleanup Progress Along the River Corridor. September 2016

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**RIVER CORRIDOR CLOSURE PROJECT**

**DOE’s Largest Environmental Cleanup Closure Project**

**Success in Project Performance**

**100-H Reactor Area**

**During Operations**

100-H Area Cleanup
- 55 waste sites cleaned up
- One of two reactors WHC finalized for “cocooning”
- Cleaned up and shipped 742,649 tons of contaminated material to Hanford’s disposal facility

March 2016

One Year for Safe, Visible Cleanup of the River Corridor

Washington Closure Hanford. Cleanup Progress Along the River Corridor. September 2016

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**Success in Project Performance**

**100-F Reactor Area**

- **100-F Area Cleanup**
  - F Reactor was the first of Hanford's reactor sites to be fully remediated.
  - 650,000 tons of contaminated material from 55 waste sites were transported away from the Columbia River.
  - F Reactor is the third of Hanford's nine plutonium production reactors constructed to support WWII and the Cold War.
  - The reactor operated from 1945 to 1965 and was shut down in 2004.

**2012 – Cleanup Complete**

*One Team for Safe, Visible Cleanup of the River Corridor*

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**The Environmental Restoration Disposal Facility (ERDF) is the “Hub” of the Site’s Waste Disposal**

- ~12M tons disposed since 2005.
- $100M ARRA expansion project completed without injury.

*ERDF’s disposal cells cover an area equivalent to 52 football fields.*

*More than 12 million tons of chromium-contaminated soil has been disposed at ERDF.*

*Most of the debris at ERDF has been remediated away from the Columbia River.*

*One Team for Safe, Visible Cleanup of the River Corridor*
Revegetation and Wetlands Restoration

- Since 2012, more than 1,100 acres along the Columbia River have been restored, including 30 acres of wetland restoration.
- More than 575,000 shrubs and 28,000 pounds of seed have been planted.
- More than 2,200 tons of native grass straw has been spread over revegetated areas.

618-10 Burial Ground

- Above: 618-10 Burial Ground, May 2016. The seven-acre waste site is one of the most hazardous at Hanford.
- Right: Workers remove a decontamination cell that was once used in a former Hanford research facility.

A significant portion of the 116-D Reactor Area has been revegetated and cleaned up after we were filled and contoured.
618-10 Burial Ground

Above: Waste is excavated, processed as appropriate, and shipped to a disposal facility.

Right: Steel over-casings have been installed at 80 vertical pipe units at the 618-10 Burial Ground. Augering completed on all 80 ahead of schedule and 33 retrieved.

324 Building and 300-296 Waste Site

Overview of 324 Chemical Engineering Laboratory
- Contaminated soil beneath B-cell discovered just prior to demolition in 2010
  - Soil highly radioactive (more than 12,000 R/hr)
  - Soil contamination confined below hot cell footprint
  - Not currently impacting groundwater – monitoring wells in place
  - Design and mock-up training facility is complete for future cleanup of 300-296 waste site
Progress Toward Placement

394 Employees* have exited the project since January 2012...

307 of those employees let us know they wanted another job

291 have already found their next job!

95%

*non-represented WCH employees

5/31/2016

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RIVER CORRIDOR CLOSURE PROJECT

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Challenges

1. Changing the culture from a bias for acceptance to one with a bias for action
2. Improve safety culture
3. Improve trust between workforce, customer and regulators
4. Implement and streamline regulatory closure process
5. Stabilize and secure consistent project funding
6. Streamline the development of solutions to technical issues and the discovery of unknown site issues
7. Develop and retain qualified Closure staffing
8. Learn to celebrate success in a negative environment

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RIVER CORRIDOR CLOSURE PROJECT

DOE’s Largest Environmental Cleanup Closure Project
RIVER CORRIDOR CLOSURE PROJECT  DOE’s Largest Environmental Cleanup Closure Project

**Washington Closure Hanford’s**

**Cleanup of the Columbia River Corridor**

- 579 waste sites remediated
- 12 million tons of waste removed
- 304 facilities remediated
- 7.4 million acres with such “hot spots” removed

*“a Hanford success” — St. Louis Post* (2000)

DOE, the U.S. Congress, and the Washington Closure Hanford and Department of Energy saw the Columbia River Corridor and its remediation of the area as an example of what can be accomplished during the post-World War II era. Your work will benefit our nation forever.

One Team for Safe, Visible Cleanup of the River Corridor

Washington Closure Hanford Cleanup Progress: Going for the River Corridor, December 2010

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