



U.S. DEPARTMENT OF  
**ENERGY**



# 2010 Congressional Nuclear Cleanup Caucus

## *DOE's Hanford Site, Washington State*

*March 4, 2010*

Dave Brockman, Manager  
DOE Richland Operations Office

Neil Brosee, President  
Washington Closure Hanford

John Lehew, President  
CH Plateau Remediation Company

Frank Figueroa, President and General Manager  
Mission Support Alliance



**EM** *Environmental Management*

safety ❖ performance ❖ cleanup ❖ closure

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# EM is Embarked on a Journey to Excellence

## ***Our Vision:***

***“EM completes quality work safely, on schedule and within cost and delivers demonstrated value to the American Taxpayer.”***



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# EM Mission and Priorities

***“Complete the safe cleanup of the environmental legacy brought about from five decades of nuclear weapons development, production, and Government-sponsored nuclear energy research.”***



- Activities to maintain a safe, secure, and compliant posture in the EM complex
- Radioactive tank waste stabilization, treatment, and disposal
- Spent nuclear fuel storage, receipt, and disposition
- Special nuclear material consolidation, processing, and disposition
- High-priority groundwater remediation
- Transuranic and mixed/low-level waste disposition
- Soil and groundwater remediation
- Excess facilities deactivation and decommissioning (D&D)



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# EM Program Goals

- **Risk Reduction**
  - Ensure the safety and health of the public and the workers
  - Protect the environment
  - Reduce the EM Footprint by 90% by 2015
- **Maintain Compliance**
  - 37 compliance agreements with state and federal regulatory agencies
  - Complete building the capability for dispositioning tank waste, nuclear materials, and spent nuclear fuel
- **EM American Recovery and Reinvestment Act Goals**
  - Thousands of jobs created or saved
  - Reduce the EM Footprint by 40% by 2011
- **Improve Project Performance**
  - Improve construction project performance
  - Deliver all projects on time and within cost
  - Remove EM projects from the GAO High-Risk List
- **Establish strategic options for Special Nuclear Materials, Spent Nuclear Fuel, Radioactive Tank Waste, Groundwater and Excess Facilities not currently in the EM portfolio**
  - Overall objective is to reduce life-cycle costs and shorten the period of program execution



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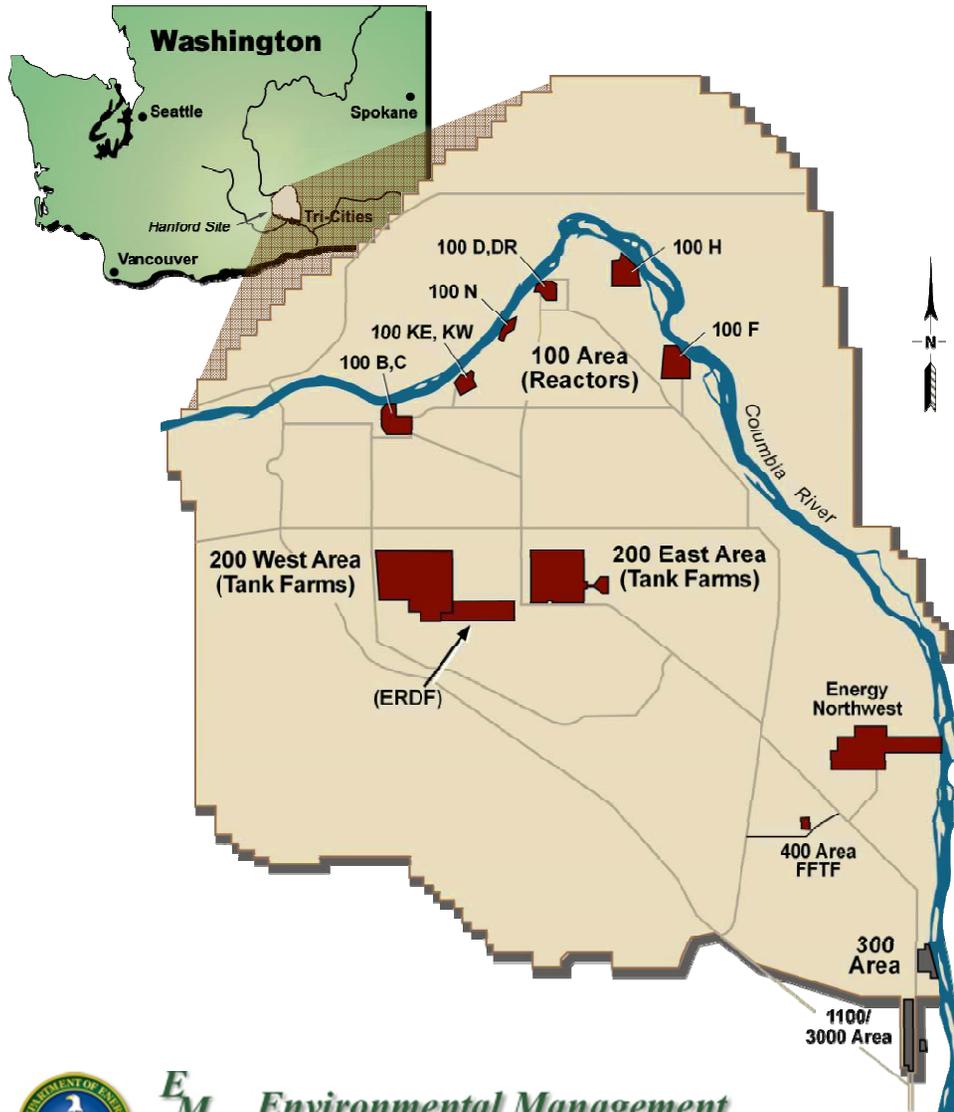
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# EM Strategic Goals

- Improve **Safety Performance** with the goal of zero accidents/incidents
- Improve **Project Management**
  - Restructuring the project portfolio
  - Adapt the Office of Science construction project model to EM
    - Construction Project Review, front end planning; appropriate pricing and contingency
  - Establish Performance Metrics for EM operating projects
  - Align project and contract management
  - Streamline the acquisition process
- Achieve **Excellence in Management and Leadership** with the objective of making EM an employer of choice in the federal government
- Align **Headquarters and Field Operations** in order to streamline decision-making and improve efficiency
- Utilize **Science and Technology** to optimize the efficiency of tank waste, excess nuclear materials, spent nuclear fuel and groundwater treatment and disposition
  - Evaluate programmatic alternatives to smartly reduce the cost of the program and period of execution



# The Hanford Site



- 586 square miles
- Constructed in WWII as part of the Manhattan Project
- Mission: Produce plutonium for national defense
- Produced about two-thirds of nation's supply of plutonium, 1944-1989
- 50 miles of the Columbia River run through Hanford
- Present status: full-scale cleanup and environmental protection
- Current employment: 11,872



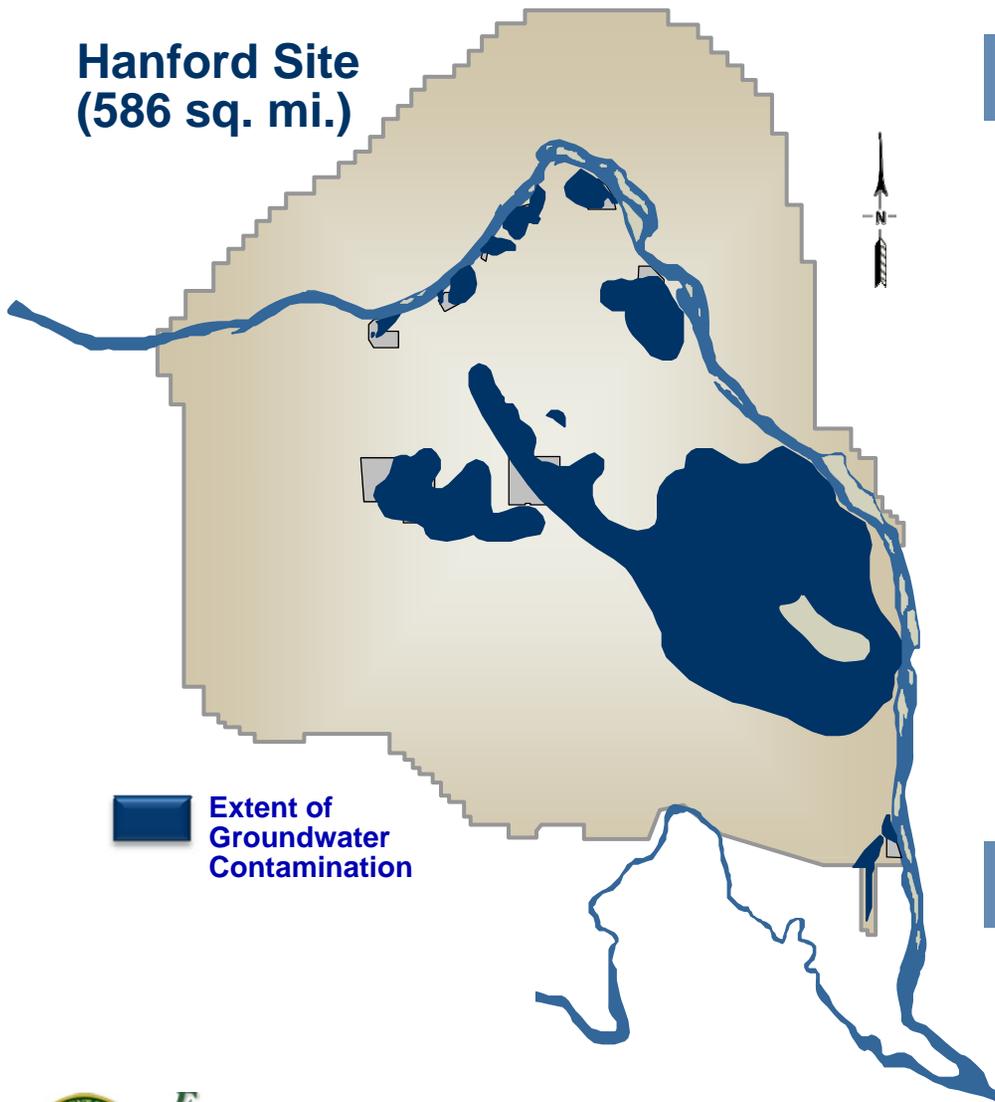
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# Hanford Plutonium Production Legacy

**Hanford Site  
(586 sq. mi.)**



## Richland Operations Office

**2,300 tons of spent nuclear fuel**

**18 tons of plutonium bearing materials**

**About 270 billion gallons of contaminated groundwater, covering about 80 square miles**

**About 25 million cubic feet of buried or stored solid waste in 175 waste trenches**

**More than 1,700 waste sites and 500 contaminated facilities, including five processing “canyons” and nine reactor complexes**

**1,936 capsules of cesium and strontium, containing about 130 million curies of radioactivity**

## Office of River Protection

**More than 53 million gallons of chemically complex radioactive waste in 177 under-ground storage tanks**



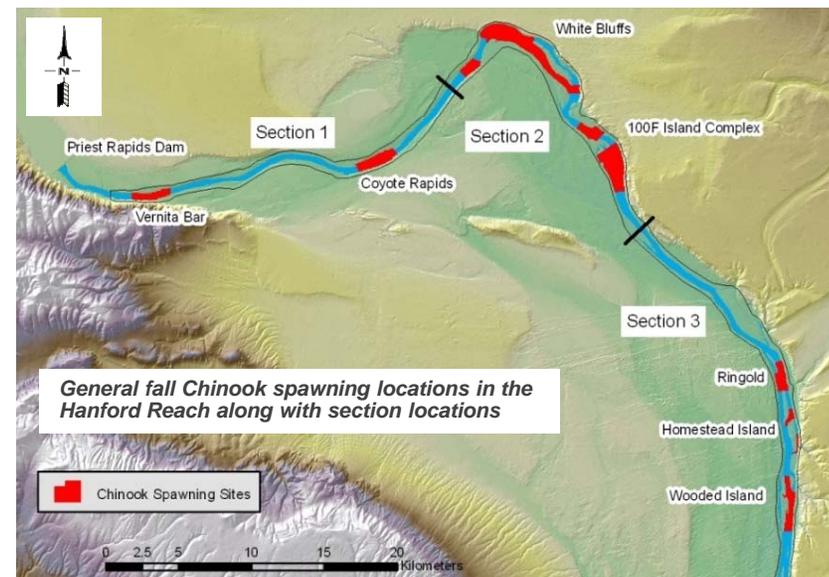
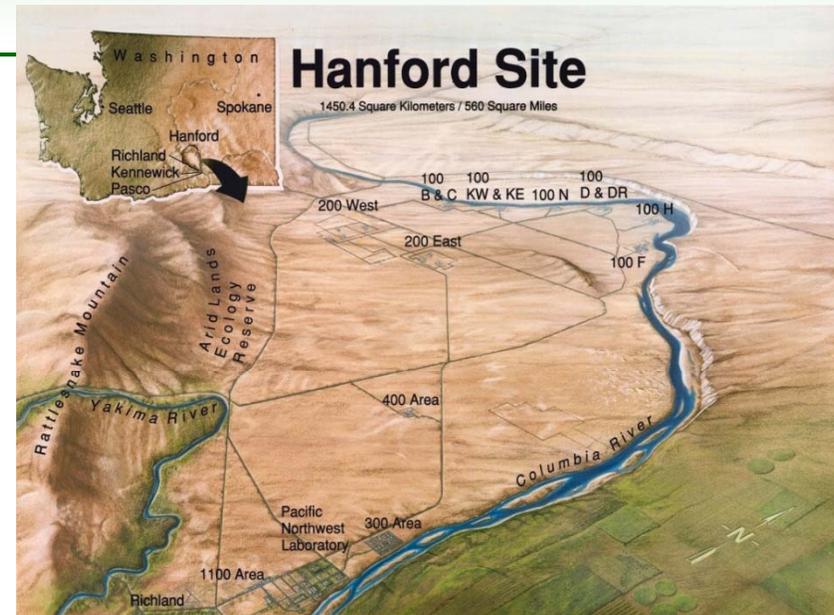
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# Hanford: What Makes the Environment Complex?

- Temperatures range from lows of -20 °F to highs of 113 °F
- Relative humidity: 55%; only 6.8 inches of precipitation per year
- Average wind speed is six to nine mph, but winds often exceeds speeds of 30 mph and have been recorded up to 58 mph
- Visibility problems include blowing dust, and smoke from field burning
- The top of Rattlesnake Mountain is 3,527 feet and the low elevation by the Columbia River is 384 feet
- 50 miles of the Columbia River run through the Site, including the last free-flowing stretch of the Columbia River



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# Cleanup Progress

## Reducing and Eliminating Hanford's Urgent Risks

- 2,300 tons of corroding spent nuclear fuel dried, moved to safe storage away from the Columbia River
- 20 tons of unstable plutonium in various forms stabilized, packaged and shipped off site
- 4.4 billion gallons of contaminated groundwater treated (50 million gallons per month)
- ~50,000 out of 70,000 drums worth of solid, radioactive waste retrieved
- About 200 of 625 facilities along the Columbia River cleaned out and demolished
- Five of nine reactors placed in interim safe storage (“cocooned”)
- More than half of the 800 Columbia River shore waste sites cleaned up
- Almost nine million tons of waste disposed of in the Environmental Restoration Disposal Facility
- On track to achieve cleanup of 210-square-mile Columbia River Corridor by 2015



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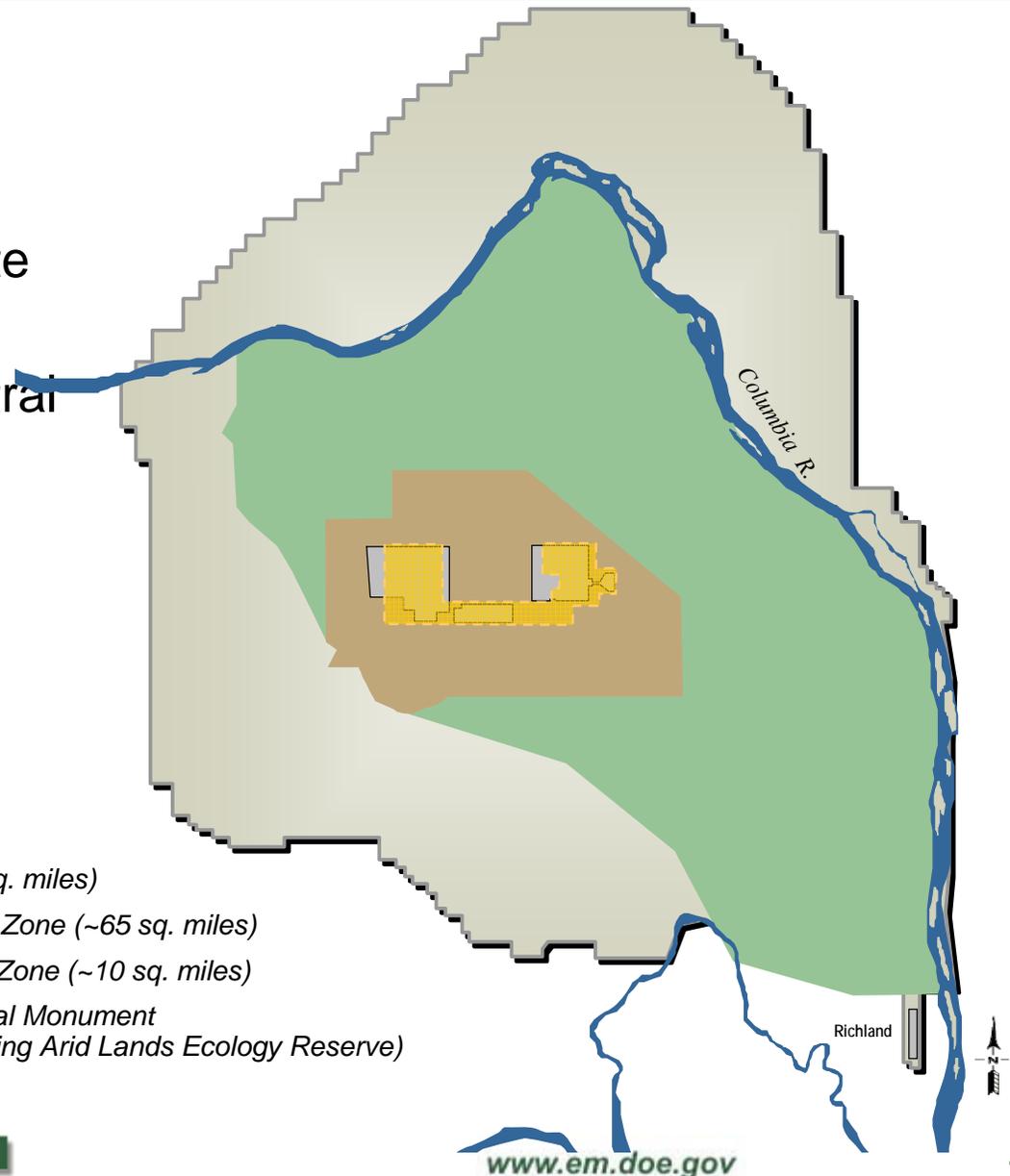
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# Priorities for Cleanup

- Protect the Columbia River
- Contain/treat contaminated groundwater
- Retrieve solid radioactive waste (suspect-transuranic waste)
- Remediate waste sites in Central Plateau Outer Area
- Demolish facilities, clean up River Corridor waste sites
- Clean out and demolish the high-hazard Plutonium Finishing Plant

-  River Corridor (~220 sq. miles)
-  Central Plateau, Outer Zone (~65 sq. miles)
-  Central Plateau, Inner Zone (~10 sq. miles)
-  Hanford Reach National Monument (~290 sq. miles, including Arid Lands Ecology Reserve)



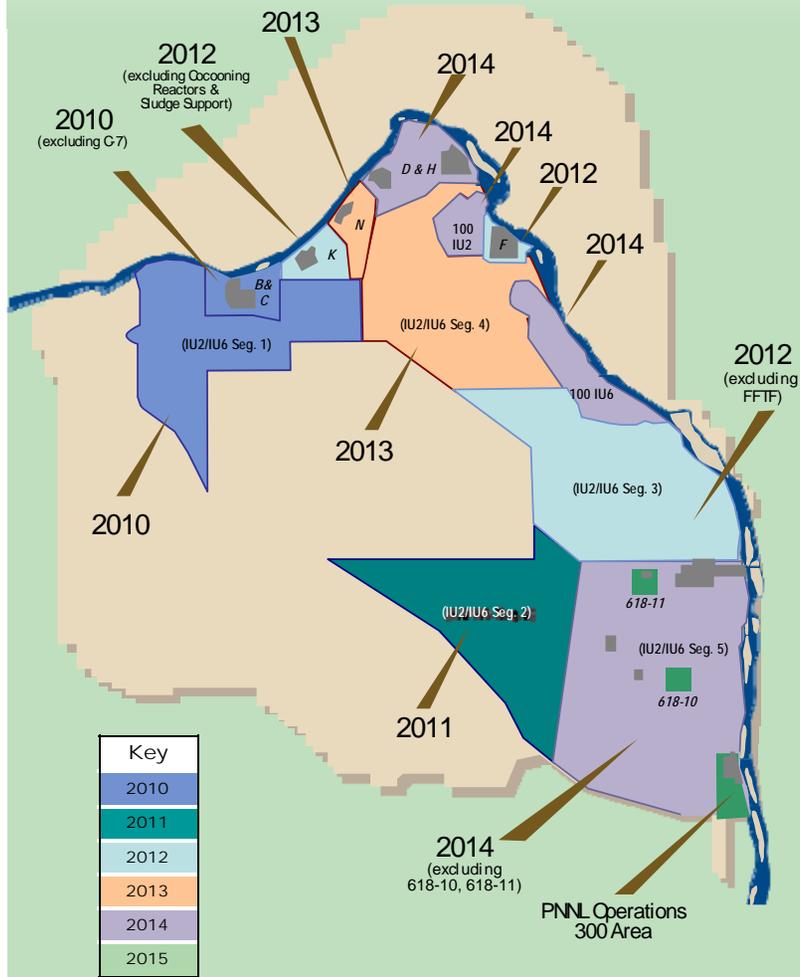
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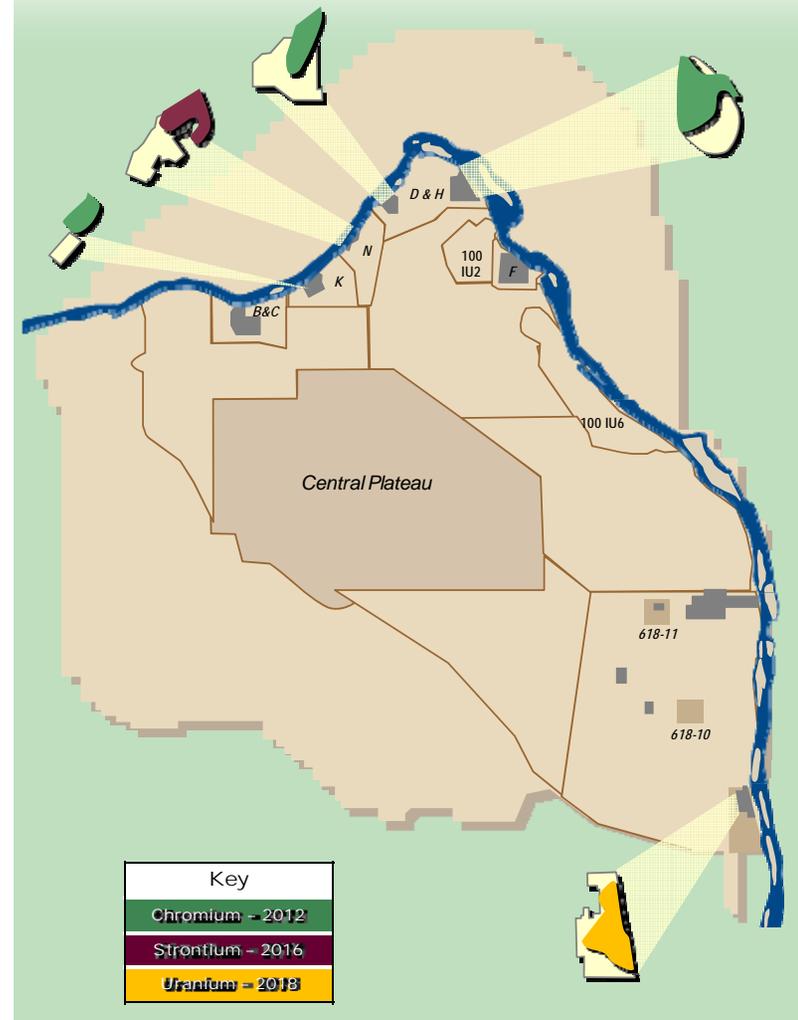
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# River Corridor Cleanup

Waste Site and D&D Completion



Containment of Key Groundwater Contaminants

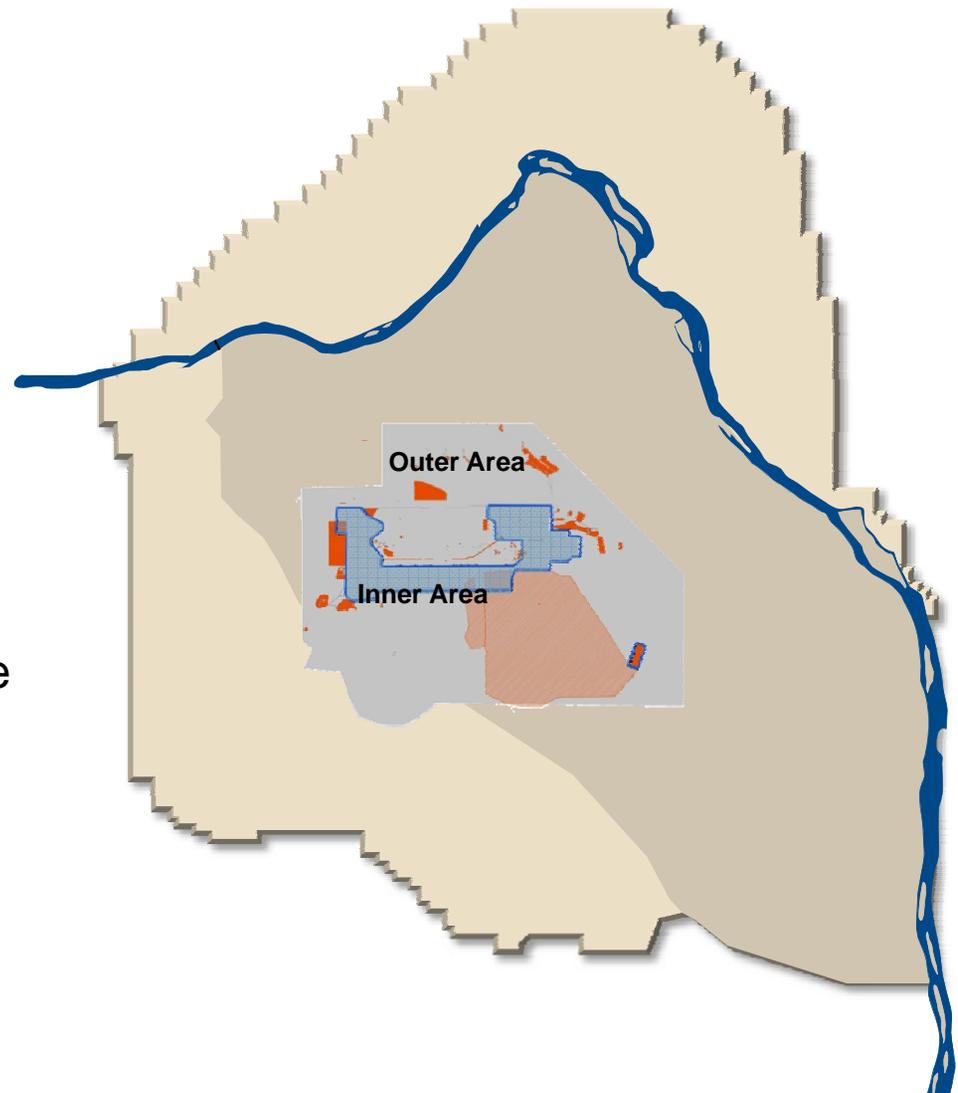


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# Central Plateau Cleanup Strategy

- Central Plateau cleanup is focused in three areas:
- Inner Area ( ~ 10 sq. miles)
  - Final footprint
  - Less than 2% of the original Hanford Site
- Outer Area ( ~ 65 sq. miles)
  - Remediate to unrestricted surface use
  - Cleanup standards comparable to River Corridor
- Groundwater
  - Contain and remediate key groundwater contaminants



# Hanford Cleanup Funding

(\$\$ in Thousands)

PBS	PBS Title	FY 2010 Approp.	FY 2011 President's Budget
RL-0011	NM Stabilization and Disposition - PFP	86,700	64,969
RL-0012	SNF Stabilization and Disposition	126,712	94,016
RL-0013	Solid Waste Stabilization and Disposition - 200 Area	131,070	135,026
RL-0020	Safeguards and Security	82,771	69,234
RL-0030	Soil and Water Remediation - Groundwater/Vadose Zone	205,390	129,629
RL-0040	Nuclear Facility D&D - Remainder of Hanford	90,313	139,641
RL-0041	Nuclear Facility D&D - River Corridor Closure Project	327,955	386,028
RL-0042	Nuclear Facility D&D - Fast Flux Test Facility Project	7,652	3,659
RL-0100	Richland Community and Regulatory Support	21,940	19,620
<b>Total - RL Office Base Funding Total</b>		<b>1,080,503</b>	<b>1,041,822</b>



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# Recovery Act Funding

- DOE developed proposals for stimulus funding with four priorities in mind:
  - Creating/saving jobs
  - Shrinking the footprint of active site cleanup
  - Reducing lifecycle costs
- The work selected for ARRA funding was already part of the Hanford cleanup scope and was included in existing prime contracts that had recently been re-competed
- The selection of work to fund under ARRA is consistent with the priorities of our regulatory agencies, Tribes, and stakeholders
- Goals
  - Accelerate cleanup along the Columbia River
  - Accelerate demolition of the Plutonium Finishing Plant
  - Allow for continued retrieval of solid, radioactive waste
  - Accelerate footprint reduction
  - Reduced lifecycle cost



# DOE-RL Recovery Act Work Highlights

Metrics	Through 1/31/10	Recovery Act Total Target
Total Facilities Demolished	10	64
• Nuclear Facilities Demolished	1	3
• Radioactive Facilities Demolished	5	18
• Industrial Facilities Demolished	4	43
Facility Square Footage Demolished	36,224	294,323
Waste Sites Remediated	3	65
Cubic Yards Soil Excavated for Disposal Cell 9 of Environmental Restoration Disposal Facility	1,789,442	1,700,000
Glove Boxes Removed from Plutonium Finishing Plant	38	174
Groundwater Wells Installed	55	265



*Workers conduct an inventory of chemicals in the U Plant Canyon*



*Workers expand an opening in a room in the Plutonium Finishing Plant so they can remove glove boxes from the plant*



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# *Neil Brosee, President*

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## Washington Closure Hanford



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# 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.

- \$2.4 billion closure project
- 210 square miles
- 10 Year contract



Deactivate, decontaminate, decommission, and demolish 486 facilities



Clean up and close 381 burial grounds and waste sites



Place four reactors into safe storage condition



Treat, transport and dispose four million tons of waste



Risk assessment and long-term stewardship



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# *Our Mission*

- Protect our workers and the community
- Protect the Columbia River
- Complete the River Corridor cleanup by 2015 and reduce the Hanford Site footprint



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# Risks and Hazards Facing Our Workers

- High-risk working conditions
- Chemical and contamination hazards to the environment and worker: chromium, asbestos, beryllium, mercury, tritium
- Industrial and construction hazards
- Un-inventoried waste sites
- High dose fuel elements and other reactor parts



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# *Our Safety Conscious Work Environment*

- Good safety record
- Achieved DOE Voluntary Protection Program Star Status – 1<sup>st</sup> company-wide at Hanford
  - Shared safety information and lessons learned with other DOE site contractors
  - Recognized for seven of nine best practices by DOE-RL radiological health & safety evaluation
    - Earned the DOE Voluntary Protection Program Innovation Award at the Voluntary Protection Program Participants Association National Conference



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# Applying Technologies to Increase Efficiency

- Deployed 14 innovative technologies provided from the public sector and other government sites
  - Reduced risks to workers
  - Increased worker efficiency
  - Reduced overall costs



Diamond wire saw can cut through composites of dissimilar materials



S.A. Robotics designed and adapted commercially available tools to tackle the highly radioactive waste removal from the 324 Building



Stand-alone powered air sampling system eliminates the reliance on AC electrical power



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# *Our Project Remains Ahead of Schedule*

- Project work is 49% complete
- 9% ahead of schedule
- 15% under budget
- Reinvested \$152 million gained in efficiencies and work improvements back into the project
- To date completed 24 of 24 regulatory agreement milestones on or ahead of schedule

*As of January 2010*



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# *Our Cleanup Momentum Continues*

- Decontaminated, demolished and loaded out 133 buildings (out of 486 total)
- Remediated 101 waste sites (out of 381 total)
- Transported and disposed of 2.5 million tons of waste at the Environmental Restoration Disposal Facility (out of four million total)



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# John Lehew, President

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## CH Plateau Remediation Company



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# CH2M HILL Plateau Remediation Company

## Work Scope

**10-year, \$4.5 Billion,  
(5 years plus 5-year  
option)**



- 100K Area remediation (2 reactor complexes, 35m<sup>3</sup> of highly radioactive material, 89 facilities to demolish, 109 waste sites)
- Plutonium Finishing Plant (PFP) closure (46 facilities to demolish, 232 glove boxes, special nuclear material and fuel)
- Groundwater/vadose zone remediation project (12 plumes with 10 major contaminants encompassing approximately 100 square miles)
- Facility, waste site, and canyon remediation (>800 facilities, more than 1,400 waste sites)
- Treatment and disposal of more than 15,000 legacy containers of radioactive waste, retrieval of 5,400m<sup>3</sup> of transuranic (TRU) waste, treatment of more than 130 million gallons of liquid waste annually, management of 2,300 metric tons of spent fuel and interim storage of 1,936 cesium and strontium capsules
- Place Fast Flux Test Facility into minimum surveillance and maintenance condition (Cold & Dark)



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Plateau Remediation Company

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# Safety Programs

## Protecting Our Workers



Unknown contamination hazards



Radiological hazards

Big 6 hazards: Slips, trips, falls  
 Radiological  
 Fire  
 Heavy equipment  
 Hoisting/rigging  
 Hazardous energy

Integrated Safety Management System/ Environmental Management System

Bargaining Unit Safety Representatives

Safety Analysis Center

Executive Safety Review Board

Hazard Review Board

Technical Response Teams

Safety Councils

Workers Observing Workers

Condition Reporting and Resolution System



Industrial / heavy equipment hazards

Note: Pictures only demonstrate types of hazards.



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# Accomplishments to Date

## Working Safe, On Schedule, Below Cost



- Cost Performance Index = 1.1  
Schedule Performance Index = 1.0
- All regulatory milestones met on or ahead of schedule
- Completed Integrated Safety Management System/ Environmental Management System Verification
- Achieved Earned Value Management System certification
- Established subcontracts – awarded >\$892M
  - Met company-established goal >49% small business goal
- Integrated \$1.3B of Recovery Act work

### Recovery Act Status Achieving Recovery Act Goals

- Completed definitization of Recovery Act scope into contract
- Directly hired or retained >1,200 jobs
- Placed >\$276 million dollars in subcontracts
  - Awarded >63% to small businesses
- Developed a comprehensive safety and field work training program for new workforce along with project-specific training
- Recovery Act reporting requirements established
- ARRA Readiness Assessment Process



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# Progress to Date

## Maintaining Momentum

### ***Decommissioning and Demolition***

- Demolished more than 35 nuclear, radiological and industrial facilities
- Placed 46 facilities into 'Cold and Dark' (634,259 sqft)
- Removed 61 Glove Boxes from Plutonium Finishing Plant
- Initiated demolition of Arid Lands Ecology Reserve facilities
- Commenced demolition of 183KW sedimentation basin
- Completed demolition of U Canyon ancillary tanks
- Approximately 65% of large equipment moved from U Canyon deck and placed into cells
- Completed 212-N, 212-P, 212-R facility demolition

- Completed Interim Storage Area (ISA) construction
- Completed plutonium shipments off site and fuel shipments to ISA
- Completed Demolition of the K East Spent Fuel Basin



Photos demonstrate different types of D&D work



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# Progress to Date

## Maintaining Momentum (cont.)

### Groundwater and Soil Remediation

- Initiated K East Spent Fuel Basin soil remediation
- Drilled 116 wells
- Treated 672 million gallons of groundwater
- Remediated 6 waste sites (35,038 tons of soil)
- Initiated BC Control Area soil remediation (~13 square miles)
- Completed Chromium 6 groundwater treatment expansion project, increasing capacity from 300 to 900 gallons per minute
- Initiated construction of DX (name of the pump and treat system) Groundwater Pump and Treat System

### Waste and Fuels Management

- Initiating Transuranic shipments to WIPP
- Retrieved >3,500 drum-equivalents of buried legacy TRU waste
- Certified >700 TRU waste drums for off-site shipment
- Disposed >12,000 drum-equivalents of legacy, low-level waste
- Completed sludge container sampling and knock-out pot inspections in K Basins
- Initiated self-perform Environmental Restoration Disposal Facility shipping and disposal
- Initiated settler tube sludge retrieval in K West Basin



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# Science and Technology

## Applying Efficiency

- Remedial Optimization tool to increase capacity and effectiveness of groundwater remediation along the Columbia River
- Glove box decontamination process to minimize size reduction and TRU waste generation, thereby accelerating decommissioning
- Point of Generation waste management approach to minimize multiple handling of waste
- Cold and Dark Process for building decommissioning and enhancing demolition safety
- Super dump trucks increase disposal capabilities and minimize worker handling



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# Project Delivery

- Complete projects that support DOE's footprint reduction vision
- Protect the Columbia River
- Job creation / retention
- Reduce hazards / risks
- Shrink active site cleanup footprint
- Achieve significant Central Plateau remediation
- Lifecycle mortgage reduction



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# Frank Figueroa, President and General Manager

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## Mission Support Alliance



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# MSA: Who We Are – What We Do

- Mission Support Alliance
  - Single purpose LLC
    - Lockheed Martin, Jacobs, WSI
  - Large and small businesses with niche Hanford expertise
- Five Primary Functions
  - Safety, Security and Environment
  - Site Infrastructure and Utilities
  - Site Business Management
  - Information Management
  - Portfolio Management
- Enable the Cleanup Mission
  - Allows prime contractors to focus on their core mission



## MSA Values

- A culture of safe and secure operations
- An ethos of integrity and ethical behavior
- An attitude of excellence in customer service
- A mentality of continuous learning and improvement



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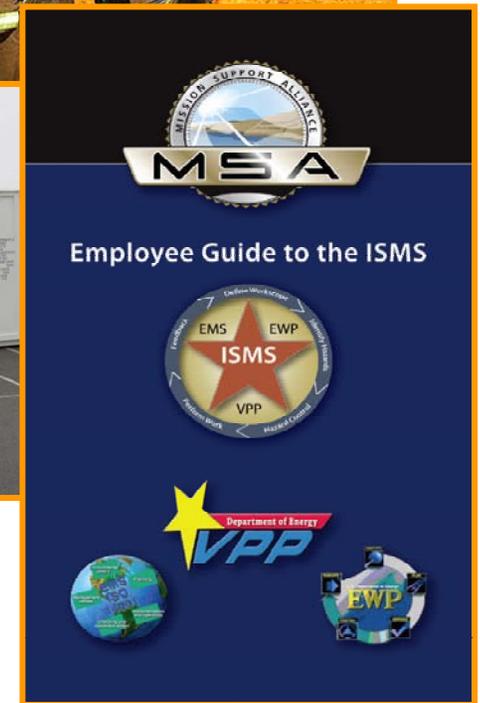
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# A Culture of Safe and Secure Operations

- Providing Stable Infrastructure and Secure Operations to Hanford Contractors
  - Skilled workforce
  - Emergency operations and response
  - Dependable infrastructure
    - Facilities and utilities
    - Roads and grounds
    - Traffic management
- Integrated Risk Management
  - Site-wide safety standards
  - Integrated Safety Management System
  - Environmental Management System
  - Safety councils



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# Technology and Innovation at Work for Hanford Contractors

- Commercial Service Delivery Model
  - Service Delivery Documents
  - Mission Service Desk – *for all site services*
  - On-Line Service Catalog
- Information Technology
  - “Build Once, Use Many”
    - Single, integrated emergency communications system
    - Mobile wireless technology
    - Consolidated IT systems
- Portfolio Management
  - “First of its Kind”
    - DOE’s site-wide integration “Trusted Agent”
    - Hanford Life-Cycle Cleanup Planning



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# MSA: Aligning Today's Services for Tomorrow's Needs

- Cost Savings
  - Reduced infrastructure costs; redeploys funding to cleanup
  - Corporate Investments; \$11 million for new technologies/efficiencies
  - Cost reduction commitment; 17% savings over 10-year period
- Efficiencies
  - Common safety processes
  - Site-wide environmental management system
  - Improved Hanford Site integration
  - Integrated Management System

***“We measure our success  
by our customers’ success”***



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