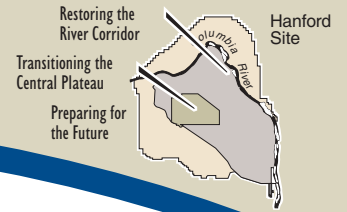




U.S. Department of Energy
Richland Operations Office
and Office of River Protection

Hanford Site



Strategic Initiative 6:

Accelerate Cleanup and Protection of Hanford Groundwater

Hanford's groundwater is an important resource and the primary pathway for contaminants from Hanford reaching the Columbia River. This initiative will institute a coordinated set of actions to protect Hanford's groundwater and the Columbia River by removing or isolating important contaminant sources on the Central Plateau, remediating the contamination sources exterior to the Central Plateau core zone, dramatically reducing the conditions that have the potential to drive contaminants into the groundwater, treating contaminated groundwater, and integrating all regulatory requirements for monitoring.



The working parts of a groundwater pump-and-treat system. The groundwater is pumped from the ground and sent through resin-filled columns to remove the contaminants, then injected back into the ground.

While we do not yet have the technology to solve some of Hanford's toughest groundwater protection problems, Hanford, Headquarters EM-50, and the DOE Office of Science are continuing to invest in new technological solutions. However, the focus of this strategic initiative is accelerating actions for which technology is available so we can get on with protection and remediation of groundwater. With this coordinated set of actions, by 2012 we will have isolated important core zone contaminant sources from the groundwater and the accessible environment and will be well on our way to a fully protective, permanent groundwater solution for the vast majority of the Hanford Site.

We made important first steps in the 1990s to protect the Hanford groundwater, but we need to do much more. We must start remedial cleanup and closure actions as soon as possible for the highest-risk waste sites. The current baseline for 200-Area waste site remediation does not begin in earnest until after 2008, and final remedial measures for groundwater contamination are not addressed at all.

A joint DOE, contractor, and regulator team is developing a groundwater strategy for Hanford that will be released in October 2002. The strategy will identify actions needed to protect the groundwater from further degradation, data needed to make sound remediation decisions, and activities and facilities necessary to remediate existing groundwater plumes. The team

examined a broad range of activities with the potential to impact groundwater and the Columbia River, including tank farms and associated waste sites, movement of spent fuel and sludge away from the river, waste disposal, canyons and other facilities, US Ecology's low-level waste disposal operations, and existing groundwater treatment activities. Based largely on this effort, we have developed five key elements to accelerate protection of groundwater in this strategic initiative.

Protection of Hanford's groundwater requires the development and implementation of a strategy to limit and control the continued migration of contaminants already in the soil and groundwater. To do this, we will: 1) control high-risk sources, 2) shrink the contaminated footprint of the Central Plateau, 3) take groundwater protection

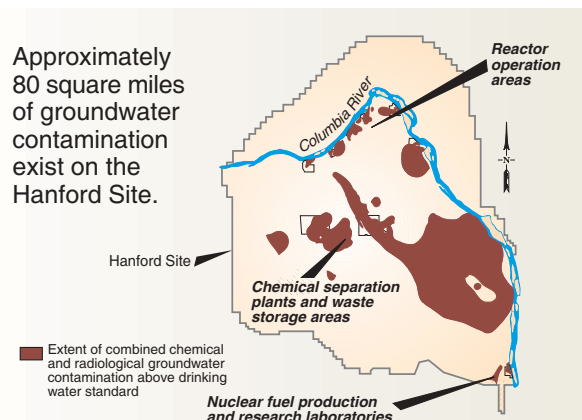
measures to reduce the artificial recharge and its impacts on subsurface contamination, 4) resolve issues associated with moving from interim to final actions, and 5) integrate site monitoring actions used to detect, delineate and evaluate the effectiveness of cleanup actions.

High-Risk Source Control

We have a number of waste sites that pose a high risk to groundwater. Some of these sites have large, mobile

HIGHLIGHTS

Approximately 80 square miles of groundwater contamination exist on the Hanford Site.



contaminant inventories and existing groundwater plumes. Others have little existing groundwater contamination, but early action may prevent or significantly reduce potential releases and further contamination of the vadose zone (the area between the soil surface and groundwater). The contaminants of primary concern on the Central Plateau are technetium-99, uranium, iodine-129, and carbon tetrachloride. These contaminants are mobile, remain dangerous for a significant period of time, have been released in large quantities, or can potentially move in the groundwater to the Columbia River and impact human health and the environment.

To address these waste sites, we assume that we will dig up and safely dispose of some waste sites while others will be covered with surface barriers to reduce the infiltration of water, which drives contaminants through the soil to the groundwater. Barriers will be constructed to specifications jointly established with the regulatory agencies. After the barriers are installed, we will monitor their performance to ensure they are working as effectively as intended.

Under this acceleration plan, we have selected four groups of waste sites for early action to isolate high-risk sources through the use of barriers; U Plant cribs and trenches; B/C cribs and trenches; PUREX cribs and trenches; and Plutonium Finishing Plant carbon tetrachloride sites.

Dramatically Reduce Recharge Conditions

As water moves through contaminated soil, it picks up contaminants and transports them to the groundwater. We have identified several actions to reduce the artificial movement of water through the soil column and to reduce or eliminate pathways for water to leach radioactive and hazardous substances from the vadose zone and drive them into the groundwater. These actions include well decommissioning, replacing aging water lines, controlling run-on/run-off, and upgrading septic systems.

Shrink the Footprint of Contaminated Areas

Several groups of waste sites are located outside the core zone of the Central Plateau. Their early remediation and closure, together with the environmental restoration activities to be completed under the River Corridor contract, will virtually eliminate all groundwater contaminant sources outside of the core zone. Under this initiative, we intend to complete these actions by 2012, instead of 2026 as our current baseline projects.

The key sites we will address under this initiative are the 200 North Area, Gable Mountain Pond/B Pond, the Non-

Radioactive Dangerous Waste Landfill, solid waste landfills, and 618-10 and -11 burial grounds.

Resolve Current Pump-and-Treat Operations

Pump-and-treat is a remediation technology for cleanup of contaminated groundwater. The groundwater is pumped to the surface through extraction wells and then treated to remove the contaminants. There are five pump-and-treat operations being used to address groundwater contamination plumes on the Hanford Site. Along the River Corridor, two systems are being used to treat chromium (100-K and 100-H Areas) and one system is being used to treat strontium-90 (100-N Area).

In the Central Plateau, there is a pump-and-treat system for carbon tetrachloride groundwater plume remediation and a system for uranium and technetium-99 remediation. Of these five operations, we have selected two



A worker removes spent resin from a pump-and-treat system, then replenishes the system with fresh material. The contaminated resin is safely disposed of in the Environmental Restoration Disposal Facility.

for accelerated action to improve performance and develop final remedies for the carbon tetrachloride and strontium-90 plumes.

Integrate Site Monitoring Needs

A joint DOE, contractor, and regulator team assigned a high priority to the need to integrate groundwater monitoring and characterization performed to satisfy the requirements of Resource Conservation and Recovery Act, the Washington State Hazardous Waste Management Act, Comprehensive Environmental Response, Compensation, and Liability Act, and the Atomic Energy Act. While the monitoring of wells and interpretation of data is coordinated through the Hanford Site Groundwater Monitoring Project, well drilling is currently performed independently to meet the different regulatory drivers. Coordinating the well drilling and monitoring requirements should result in an overall cost savings and an improved monitoring program.

We will also consider long-term stewardship needs in planning for groundwater monitoring. This includes the need to evaluate technologies, other than wells, that are less expensive to install and require little or no maintenance over the extended period for which active monitoring is required.