

The 200 West Pump-and-Treat Building provides treatment of contaminated groundwater from Hanford's Central Plateau.



The U.S. Department of Energy and contractor CH2M HILL Plateau Remediation Company are safely cleaning up groundwater at the Hanford Site in southeastern Washington State.

Background

The U.S. Department of Energy applies pump-and-treat technology to diminish large contaminant plumes as part of a multi-technology strategy. In addition to pump-and-treat methods, the strategy includes using passive approaches and targeted source treatment to effectively clean up the groundwater and protect the Columbia River.

During historical Hanford activities of fuel fabrication, nuclear reactor operation, and chemical processing to extract targeted nuclear materials, significant quantities of solid and liquid wastes were discharged to the environment as planned and unplanned releases.

These discharges caused multiple, large-scale groundwater contaminant plumes at the Hanford Site. Contaminants include long-lived radionuclides and other chemicals that pose risks needing to be addressed for the protection of human health and the environment.

Mission

Hanford's groundwater program includes a network of more than 2,000 wells and other tools. CHPRC operates five pump-and-treat systems along the river and one at the center of the Hanford Site. Combined, these systems treat more than 2 billion gallons of groundwater annually — enough water to fill trucks lined up from Los Angeles to New York. The treatment systems will continue to remove contaminants from the groundwater.



A worker samples groundwater along the Columbia River.



Groundwater containing hexavalent chromium is sampled from wells near the Columbia River.



Groundwater Pump-and-Treat Operations (Continued)



Ion exchange treatment train removes uranium and technetium-99 from the groundwater at the 200 West Area Pump-and-Treat Facility.



A soil flush treatability test was initiated in 2019 to expedite the cleanup of hexavalent chromium.



Workers collect more than 25,000 samples a year to monitor soil and groundwater contamination.



Well drilling operations on the Central Plateau.

Cleanup Legacy

Two main areas at the Hanford Site have contaminated groundwater: the area along the river, called the Columbia River corridor, and center of the site, called the Central Plateau. Pump-and-treat systems remove the contaminants of concern listed below:

- River Corridor:
 - Hexavalent chromium
 - Strontium-90
- Central Plateau:
 - Uranium
 - Carbon tetrachloride
 - Nitrate
 - Technetium-99
 - Trichloroethylene
 - Chromium
 - Hexavalent chromium
 - Iodine-129
 - Tritium

Safety and Efficiency

Process improvements have resulted in substantial progress in the removal of groundwater contaminants, potentially shortening the period required to meet cleanup goals and resulting in significant cost savings.

DOE and CHPRC are always seeking more safe, efficient, and cost-effective ways to improve the performance of the groundwater treatment network, with protection of the Columbia River the ultimate goal.

Progress

- Removed nearly 90 tons of contaminants and treated more than 2.4 billion gallons of contaminated groundwater combined at Hanford's six operating pump-and-treat facilities
- Completed modifications and upgrades to existing equipment at the pump-and-treat facilities, avoiding the cost of replacement and improving efficiencies
- Installed a chlorine disinfection system to keep well lines clear and improve the efficiency of the 200 West Pump-and-Treat Facility – Hanford's largest groundwater treatment plant
- Achieved sustained operation of the 200 West Pump-and-Treat Facility at or above treatment capacity of 2,500 gallons per minute for the first time
- Recently marked the removal of 1 million pounds of nitrate since the 200 West Pump-and-Treat Facility began operations in 2012

Future

Groundwater treatment will continue to support Hanford cleanup activities to protect the Columbia River. Groundwater sampling helps inform decisions about future well placement and configuration to maximize treatment effectiveness.

