

Abstract

This report presents the results of groundwater monitoring for fiscal year (FY) 2007 on the U.S. Department of Energy's (DOE's) Hanford Site in southeast Washington. Results of groundwater remediation and vadose zone studies are summarized.

Contaminant plumes occupy an area of ~183 square kilometers at levels exceeding one or more drinking water standards, compared to the total area (1,500 square kilometers) of the Hanford Site. The most extensive contaminant plumes in groundwater are tritium, iodine-129, and nitrate. These contaminants originated from multiple sources and are very mobile in groundwater. The largest portions of these plumes are migrating from the central Hanford Site to the southeast, toward the Columbia River, and concentrations generally are declining. Carbon tetrachloride and associated organic constituents form a relatively large plume beneath the west-central part of the Hanford Site. Hexavalent chromium is present in plumes beneath the reactor areas along the river and beneath the central part of the site. Strontium-90 concentrations exceed drinking water standards beneath portions of all but one of the reactor areas. Technetium-99 and uranium plumes exceeding standards are present in the 200 Areas. A uranium plume exceeding standards also underlies part of the 300 Area. Small contaminant plumes with concentrations greater than standards include carbon-14, cesium-137, cis-1,2-dichloroethene, cyanide, fluoride, plutonium, and trichloroethene.

Levels of some contaminants exceed drinking water standards in water samples collected from aquifer sampling tubes along the river shore. The most significant exceedances were strontium-90 in the 100-N Area, chromium in the 100-D Area, and uranium in the 300 Area. Uranium also exceeded the drinking water standard in a riverbank spring in the 300 Area. Tritium was near the drinking water standard in a spring at the former Hanford town site.

Monitoring for the *Comprehensive Environmental Response, Compensation, and Liability Act* (CERCLA) is conducted in 11 groundwater operable units. The purpose of this monitoring is to define and track plumes and to monitor the effectiveness of interim remedial actions. Interim groundwater remediation in the 100-K, 100-D, and 100-H Areas, using a combination of pump-and-treat and in situ methods, continued to reduce the amount of chromium reaching the Columbia River. An in situ treatment system for strontium-90 is being implemented in the 100-N Area. A pump-and-treat system and a soil-gas extraction system in the northern half of the 200 West Area continued to be used to decrease the spread of the carbon tetrachloride plume. A pump-and-treat system for technetium-99 and uranium in the south part of the 200 West Area was restarted in FY 2007.

Resource Conservation and Recovery Act (RCRA) groundwater monitoring continued at 25 waste management areas during FY 2007:

- 15 under interim or final status detection programs, with the objective of determining whether or not they are adversely affecting groundwater
- 8 under interim status groundwater quality assessment programs to assess contamination
- 2 under final status corrective-action programs

During calendar year 2007, drillers completed 57 new wells for monitoring, remediation, or characterization. Ninety-one unneeded wells were decommissioned (filled with grout).

This report is available on the Internet through the Hanford Site Groundwater Remediation Project (<http://www.hanford.gov/cp/gpp>).