

# Proposed Cleanup Plan for Groundwater and Waste Sites in Hanford's 100-D/H Area

The U.S. Department of Energy (DOE), U.S. Environmental Protection Agency (EPA), and Washington State Department of Ecology (Ecology) — Tri-Party Agreement (TPA) agencies — request your input on the Proposed Plan for the cleanup of contaminated waste sites and groundwater in the 100-D/H Area of the Hanford Site in southeastern Washington state. The plan proposes using a combination of technologies including pumping and treating the groundwater and excavating and disposing of contaminated soil. The Proposed Plan presents cleanup options and identifies the preferred alternative. The 30-day public comment period, begins on July 26 and closes on ~~August 26, 2016~~ **September 16, 2016**.

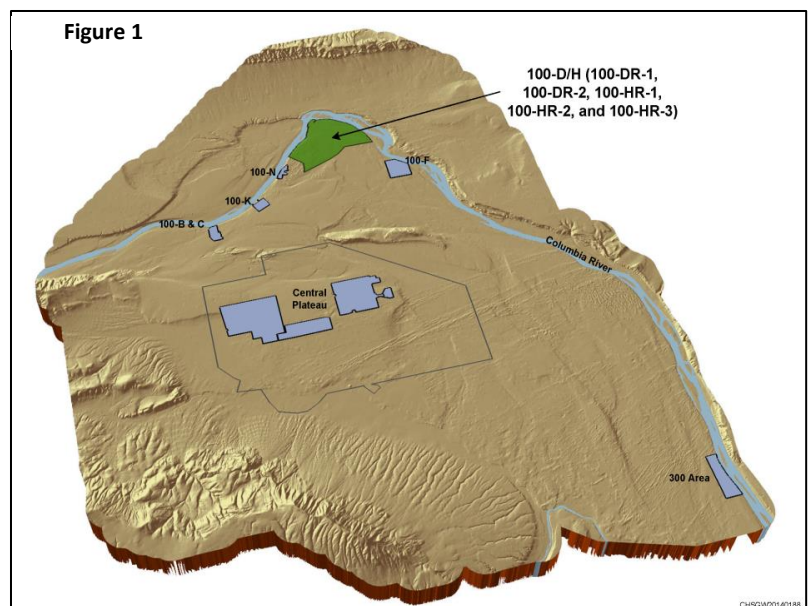
**July 2016** **U.S. Department of Energy**

## Background

The area of the Hanford Site that borders the Columbia River is referred to as the River Corridor. The River Corridor, which spans approximately 570 km<sup>2</sup> (220 mi<sup>2</sup>), has been divided into six geographic areas. These six areas align with historical operations (e.g., uranium fuel rod preparation or reactor operations). The 100-D/H Area includes the 100-DR-1, 100-DR-2, 100-HR-1, 100-HR-2 and 100-HR-3 Operable Units (OUs) (Figure 1).

The 100-D/H Area encompasses approximately 20 km<sup>2</sup> (7.8 mi<sup>2</sup>) and includes three deactivated nuclear reactors and support facilities that operated to produce plutonium from 1944 to 1967.

The reactors and processes associated with operations generated large quantities of liquid and solid wastes containing radionuclides, hazardous chemicals, or both. Large volumes of river water were used as cooling water during reactor operations, and the river water was treated with sodium dichromate to reduce corrosion. Leaks of sodium dichromate from pipelines and other spills resulted in high concentrations of hexavalent chromium contamination in the soil and in the groundwater.



## Regulatory Background

This is the third of six long-term cleanup decisions planned for sites along the Columbia River. The 300 Area Record of Decision (ROD) was issued in November 2013 and the 100-F/IU ROD was issued in November 2014.

## Previous Cleanup Actions

Waste site remediation in the 100-D/H Area began in 1995 under the *Interim Remedial Action Record of Decision for the 100-BC-1, 100-DR-1, and 100-HR-1 Operable Units, Hanford Site, Benton County, Washington (EPA/ROD/R10-95/126)*. Interim actions consisted primarily of removal, treatment and disposal of contaminated soils, followed by backfill and revegetation. Contaminated material was excavated and transported to the Environmental Restoration and Disposal Facility (ERDF), located in the 200 Area of the Hanford Site.

Between 1995 and November 2012, interim remove, treat and dispose (RTD) actions were completed for 180 waste sites in the 100-D/H Area. Post-cleanup confirmation sampling results at these sites were evaluated and demonstrate that the proposed cleanup levels identified in this Proposed Plan have been met.

Groundwater remediation by extraction and treatment was initiated in 1997 under the interim action ROD (EPA/ROD/R10-96/134) with startup of the first pump-and-treat system (HR-3). The objective of the interim remediation was to remove Cr(VI) contamination from groundwater and address immediate threats to the Columbia River. A second pump-and-treat system (DR-5) began operating in 2004. The initial two pump-and-treat systems (DR-5 and HR-3) were expanded to include additional treatment capacity under the 2009 Explanation of Significant Differences for the OUs Interim Action ROD.

## About the 100-D/H Proposed Plan

DOE has developed a proposed plan under the *Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA)* to address remaining soil and groundwater contamination in the 100-D/H Area. The proposed plan addresses contaminated waste sites in four source OUs (100-DR-1, 100-DR-2, 100-HR-1, and 100-HR-2) and contaminated groundwater in the 100-HR-3 OU. These five OUs are referred to collectively as 100-D/H.

## Preferred Alternative

Based on the results of the detailed and comparative evaluation, Alternative 3 is the preferred alternative.

For soil, Alternative 3 calls for RTD of contaminated soil and debris from waste sites with institutional controls (ICs) used to control access to residual contaminants in the soil.

For groundwater, Alternative 3 calls for increased capacity pump-and-treat, along with monitored natural attenuation (MNA) and ICs to control access to residual contaminants in the groundwater. MNA is the decrease of contaminants through natural processes such as radioactive decay, chemical stabilization, sorption or biodegradation.

Alternative 3 is the preferred alternative because it achieves protection of human health and the environment, satisfies the applicable or relevant and appropriate requirements (ARAR) as defined by EPA, and provides the best balance of trade-offs compared to the other alternatives. Additionally, Alternative 3 provides the shortest estimated time for waste site cleanup.

## Alternatives Evaluated

The proposed plan presents four remediation options and identifies a preferred alternative.

Alternative	Components	Estimated Time Frame for Cleanup	Cost (in millions)
<b>1 – No Action</b>	-	-	-
<b>2 – RTD (104 waste sites), MNA with ICs (5 shallow and 34 deep waste sites), Pipeline Capping with ICs (1 waste site), and No Action (153 waste sites). Pump-and-Treat, additional (up to 30) Groundwater Wells, Biological Treatment, and MNA with ICs for groundwater.</b>	<ul style="list-style-type: none"> <li>Excavate contaminated soil and debris, treat to meet land disposal restrictions, and dispose of backfill, re-contour, and plant with native vegetation</li> <li>MNA</li> <li>Monitoring – additional wells to track cleanup progress</li> <li>ICs to prevent exposure to residual contamination</li> <li>Pump-and-treat with biological injection to treat groundwater contamination</li> </ul>	Waste sites - 25 years (shallow MNA with ICs)	\$333
		Groundwater:  Cr(VI) and total chromium – 25 years  Nitrate – 13 years  Strontium-90 – 56 years	
<b>3 (Preferred Alternative) – RTD (104 waste sites)*, MNA with ICs (5 shallow and 34 deep waste sites), Pipeline Capping with ICs (1 waste site), and No Action (153 waste sites). Increased Capacity Pump-and-Treat, additional (up to 80) Groundwater Wells, and MNA with ICs for groundwater.</b>	<ul style="list-style-type: none"> <li>Excavate contaminated soil and debris, treat to meet land disposal restrictions, and dispose of; backfill, recontour, and plant with native vegetation</li> <li>MNA</li> <li>Monitoring – additional wells to track cleanup progress</li> <li>Institutional controls to prevent exposure to residual contamination</li> <li>Pump-and-treat with increased capacity to treat groundwater contamination</li> </ul>	Waste sites - 25 years (shallow MNA with ICs)	\$374
		Groundwater:  Cr(VI) and total chromium – 12 years  Nitrate – 6 years  Strontium-90 – 44 years	
<b>4 – RTD (108 waste sites), MNA with ICs (2 shallow and 34 deep waste sites), and No Action (153 waste sites). Pump-and-treat, additional (up to 30) Groundwater Wells, and MNA with ICs for groundwater.</b>	<ul style="list-style-type: none"> <li>Excavate contaminated soil and debris, treat to meet land disposal restrictions, and dispose of backfill, re-contour, and plant with native vegetation</li> <li>MNA</li> <li>Monitoring – additional wells to track cleanup progress</li> <li>Institutional controls to prevent exposure to residual contamination</li> <li>Pump-and-treat to treat groundwater contamination</li> </ul>	Waste sites – 5 years (RTD)	\$430
		Groundwater:  Cr(VI) and total chromium – 39 years  Nitrate – 13 years  Strontium-90 – 56 years	

**\*101 of the RTD waste sites under the preferred alternative have been cleaned up under the Interim Action ROD since November 2012. These waste sites are expected to meet the proposed final cleanup standards.**

To request a public meeting or for additional questions, please contact Rich Buel, DOE-RL, (509) 376-3375. Copies of the Proposed Plan and supporting documentation are available at the Administrative Record, 2440 Stevens Drive, Richland, WA and the information repositories listed below. Alternatively, the Proposed Plan and supporting documents can be accessed online:

<http://pdw.hanford.gov/arpir/pdf.cfm?accession=0075807H>

## How you can get involved

Comment period – July 26 through ~~August 26, 2016~~ **September 16, 2016**

Please submit comments by ~~August 26, 2016~~ **September 16, 2016** to:



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The documents are available for review at the Public Information Repositories listed below

### HANFORD PUBLIC INFORMATION REPOSITORY LOCATIONS

#### **Portland**

Portland State University Library  
Government Information  
Branford Price Millar Library – LIBW  
PO Box 1151  
Portland, OR 97207-1151  
Attn: Claudia Irla (503) 725-4542  
Map: <http://bit.ly/1K7BfuK>

#### **Richland**

U.S. Department of Energy Public Reading Room  
Washington State University, Tri-Cities  
Consolidated Information Center, Room 101-L  
2770 University Drive  
Richland, WA 99352  
Attn: Janice Scarano (509) 375-7443  
Map: <http://bit.ly/1LpZKUa>

#### **Seattle**

University of Washington  
Suzzallo Library  
Box 352900  
Seattle, WA 98195-2900  
Attn: Hilary Reinert c/o ARCS  
(206) 543-5597  
Map: <http://bit.ly/1QMtUog>

#### **Spokane**

Gonzaga University  
Foley Center Library  
East 502 Boone Avenue  
Spokane, WA 99258  
Attn: John Spencer (509) 313-6110  
Map: <http://bit.ly/1CpOmRT>

#### **Administrative Record and Public Information Repository**

2440 Stevens Center Place, Room  
1101, Richland, WA  
509-376-2530  
<http://pdw.hanford.gov/arpir/>