Ecology Proposes Changes to Waste Treatment Plant Permit

The Washington State Department of Ecology (Ecology) is proposing a change to the *Hanford Facility Resource Conservation and Recovery Act (RCRA) Permit*, Revision 8C. This change affects the *Dangerous Waste Portion for the Treatment, Storage, and Disposal of Dangerous Waste* for the Waste Treatment and Immobilization Plant (WTP Permit). The proposed change is located in Part III, Operating Unit 10.

The permittees are:

U.S. Department of Energy Office of River Protection
P.O. Box 450
Richland, Washington 99352

Bechtel National, Inc.
2435 Stevens Center Place
Richland, Washington 99354

The proposed change will add to the WTP Permit a design package for installation of equipment for the Low-Activity Waste Facility Melter Process System. This design package is explained on page 2.

This proposal is one of many modifications to the original WTP Permit. Periodic updates allow the permittees to continue construction while designing other parts of the WTP.

Waste Treatment Plant Overview

The WTP has three facilities that will separate and process Hanford's tank waste for long-term disposal:

- Pretreatment Facility
- Low-Activity Waste Vitrification Facility
- High-Level Waste Vitrification Facility

At the heart of tank waste treatment is vitrification, or immobilizing waste into solid glass.

In the Pretreatment Facility, tank waste is separated into low-activity waste and high-level waste. The waste is then sent to either the low-activity waste or high-level waste vitrification facility, where it is mixed with glass formers, and piped to large heating containers called melters.

Why It Matters

The proposed permit changes affect the Waste Treatment and Immobilization Plant (WTP). WTP will immobilize in glass 56 million gallons of dangerous radioactive and chemical waste stored in 177 underground storage tanks at Hanford.

Some waste from the tanks has polluted groundwater that flows toward, and can seep into, the Columbia River. Safely treating tank waste is an important goal to help protect people and the environment.

Public Comment Period

July 11, 2016 -
August 25, 2016

To Submit Comments

Please send comments by email (preferred), U.S. mail, or hand deliver them to:

Ginger Wireman
3100 Port of Benton Blvd.
Richland, WA 99354
Hanford@ecy.wa.gov

Public Hearing

A public hearing is not scheduled, but if there is enough interest, we will consider holding one. To request a hearing or for more information, contact:

Ginger Wireman
509-372-7950
Hanford@ecy.wa.gov

Special Accommodations

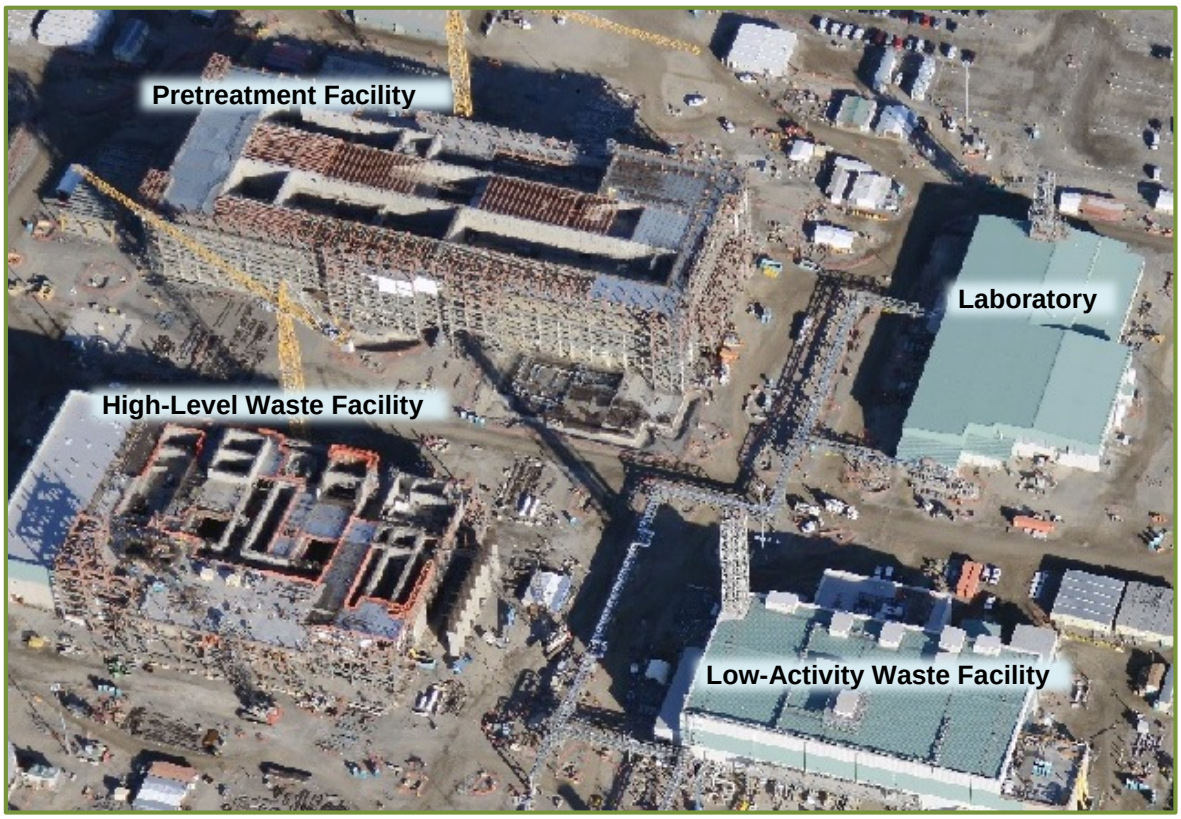
To request ADA accommodation, including materials in a format for the visually impaired, call the Nuclear Waste Program at 509-372-7950.

Persons with impaired hearing may call Washington Relay Service at 711.

Persons with speech disability may call TTY at 877-833-6341.

During vitrification, the melters will heat pretreated tank waste and glass-forming chemicals to 2,100 degrees Fahrenheit. Then the molten liquid will be poured and sealed in stainless-steel disposal containers, where it will cool into solid glass logs (solid waste).

In glass form, the waste is still radioactive. However, the solid waste will be extremely durable and waterproof, which will protect people and the environment for thousands of years as the radioactivity decays.



The Waste Treatment Plant, commonly called the vit plant, in October 2015 (photo courtesy of Bechtel).

Design Package for the Low-Activity Waste Melter Process System

The Low-Activity Waste (LAW) Facility permit package, LAW-016, addresses installation of the two LAW melters at the three foot elevation of the LAW Facility.

In the Low-Activity Waste Melter Process (LMP) System, LAW melter feed consisting of LAW waste concentrate mixed with glass former chemicals, is transferred as a slurry by air displacement pumps from the Melter 1 Feed Vessel (LFP-VSL-00002) to LAW Melter 1 (LMP-MLTR-0001) through feed nozzles in the melter lid. The process is the same for slurry transferred from the Melter 2 Feed Vessel (LFP-VSL-00004) to LAW Melter 2 (LMP-MLTR-00002).

In each melter, the slurry is fed through a system of six feed nozzles into a glass melt pool that is maintained at a temperature of 1050 ºC to 1200 ºC (1922 ºF to 2192 °F). When the slurry first falls onto the top of the melt pool, the slurry will form a cold cap on top of the melt pool. Bubblers inside the melters agitate the glass pool to aid in mixing the cold cap with the molten glass.

Six electrodes embedded in the refractory provide the joule heating that keeps the melt pool temperature constant and melts the cold cap. When the melt pool level inside of a melter reaches an appropriate level, the process is started to lift glass into the discharge chambers into a container.

The evaporated water and waste feed volatile constituents are treated by the primary and secondary offgas treatment systems, monitored, and released to the atmosphere.

Reviewing the Proposed Changes

Ecology invites you to review and comment on this proposed WTP Permit change. The comment period runs from July 11, 2016, through August 25, 2016. See the box on the right side of page 1 for information on how to submit comments.

During the public comment period, documents will be available for review, beginning July 11, 2016, on Ecology's website and at the locations listed on page 4.

Terms To Know

Dangerous Waste Permit: A State-issued permit allowing facilities to store, treat, and/or dispose of dangerous waste.

Deep geologic repository: A long-term nuclear waste disposal site excavated underground, below 980 feet, in a stable geologic environment.

High-level waste: Results from reprocessing spent nuclear fuel. This includes liquid produced during reprocessing and solids derived from this liquid waste that contain fission products in sufficient concentrations and other highly radioactive material that, by law, requires permanent isolation.

Low-activity waste: Remains after as much radioactivity as is technically and economically practical has been separated from high-level waste. When vitrified, it may be disposed of as low-level radioactive waste in a near surface facility at Hanford.

Offgas: A gaseous and hazardous byproduct of tank waste treatment.

Resource Conservation & Recovery Act (RCRA): Law authorizing the U.S. Environmental Protection Agency to manage hazardous waste, including the generation, transportation, treatment, storage, and disposal of radioactive hazardous and other solid waste and waste in underground tanks.

Underground storage tank: A tank that is entirely below the surface of and covered by the ground.

At Hanford, two types of underground storage tanks have capacities ranging from 50,000 to 1,000,000 gallons. The single-shell tanks have one steel liner encased in reinforced concrete, and do not comply with State environmental laws. The double-shell tanks have two steel liners in reinforced concrete and contain potential leaks, in compliance with the law.

Vitrification: Immobilizing waste by mixing it with glass formers and melting the mixture into a glass form that cools into a solid.

Waste Treatment and Immobilization Plant: Facility to thermally treat and vitrify tank waste at Hanford.

DEPARTMENT OF ECOLOGY
State of Washington

3100 Port of Benton Blvd.
Richland, WA 99354

Public Comment Period
Hanford's Waste Treatment Plant Permit Modification
July 11, 2016 - August 25, 2016

Hanford's Information Repositories and Document Review Locations

Richland
Ecology Nuclear Waste Resource Center
3100 Port of Benton Blvd.
Richland, WA 99354
Contact: Valarie Pardue
509-372-7950

Department of Energy Administrative Record
2440 Stevens Drive, Room 1101
Richland, WA 99354
Contact: Heather Childers
509-376-2530

Department of Energy Reading Room
2770 Crimson Way, Room 101L
Richland, WA 99354
Contact: Janice Parthree
509-375-3308

Portland
Portland State University
Branford Price Millar Library
1875 SW Park Avenue
Portland, OR 97207
Contact: Claudia Weston
503-725-4542

Seattle
University of WA Suzzallo Library
P.O. Box 352900
Seattle, WA 98195
Contact: Hilary Reinert
206-543-5597

Spokane
Gonzaga University Foley Center
502 E Boone Avenue
Spokane, WA 99258
Contact: John Spencer
509-313-6110