

# Tank Closure and Waste Management Environmental Impact Statement

**Nuclear Waste Program**

**January 2010**

## Focus on Technetium-99 Removal

### Ecology's View

Ecology supports Alternative 2B because it would incorporate more technetium-99 (Tc-99) in high-level waste (HLW) glass, which will eventually go offsite.

Technetium-99 is difficult to treat. It is soluble and mobile in groundwater. It can be taken up by plants and animals. It has a long half-life and remains dangerous for thousands of years. Because of this hazard, it is important for the waste form to capture and hold the Tc-99. The best waste form for this is vitrified glass.

### What the Draft EIS Says

For tank waste treatment, the U.S. Department of Energy (USDOE) selected Alternatives 2A, 2B, 3A, 3B, 3C, 4, and 5 as preferred alternatives.

Currently USDOE does not plan to install equipment in the Waste Treatment Plant (WTP) to remove Tc-99 from low-activity waste (LAW) streams. The draft EIS evaluates adding back Tc-99 removal in two alternatives (2B and 3B).

In Alternative 2B (Expanded WTP Vitrification) USDOE would remove Tc-99 from the LAW streams and send it to HLW vitrification (for both the LAW facility USDOE is now building, and the proposed second LAW facility).

In Alternative 3B (Existing WTP Vitrification with Cast Stone Supplemental Treatment) USDOE would remove Tc-99 from the LAW feed streams for 200E cast stone facility, and send it to the HLW vitrification. No other alternative would remove Tc-99 from the LAW feed.

### Ecology's Analysis

The table on the next page shows that most of the released Tc-99 comes from "other solid secondary waste," rather than the immobilized low-activity waste LAW. It

#### MORE INFORMATION

The Tank Closure & Waste Management Environmental Impact Statement (EIS) will support decisions for the final cleanup of much of the waste at Hanford – the tank farms, the rest of the waste in the tanks, and the Fast Flux Test Facility.

The draft EIS also analyzes impacts to groundwater from waste disposal activities to determine whether it is safe for Hanford to dispose of more wastes.

**Comments accepted through  
May 3, 2010.**

#### Send comments to

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also shows that the total amount released is slightly lower if Tc-99 is sent to the LAW stream. That is because tests show that LAW melter captures Tc-99 better than HLW melter does. The Tc-99 the glass does not capture would be trapped in the melter offgas treatment system and end up as other solid secondary waste.

Technetium-99 Curies Released to Groundwater from Onsite Disposal Sources		
Onsite Disposal Source	Alternative 2B (Expanded WTP) with Tc-99 Removal	Alternative 2B (Expanded WTP) without Tc-99 Removal
ILAW Glass	0.05	5
Solid waste from Effluent Treatment Facility	50	50
Other solid secondary waste	200	180
Total	250	235

Ecology used data from the draft EIS to create this table. The center column shows how much Tc-99 is released to groundwater under Alternative 2B (based on Figure N-87). We compared Table D-35 (Alternative 2A) and Table D-37 (Alternative 2B). The resulting estimate is shown in the third column. Without Tc-99 removal, less Tc-99 is released.

Table O-50 (Appendix O of the draft EIS) shows that groundwater impacts from Alternative 3B are severe, even with Tc-99 removed in WTP's LAW facility and a supplemental 200 East Area cast stone facility. In Alternative 3B, the Tc-99 released is 5022 pCi/L (five times the drinking water standard of 900 pCi/L) in the 200 East Area Integrated Disposal Facility.

## Ecology's Perspective

The draft EIS shows that moving Tc-99 to HLW glass makes little or no difference in actual groundwater risk. However, Ecology would support sending more of the Tc-99 offsite to a deep geologic repository as long as it would not further impact the secondary waste problem. Issues that make this subject difficult are:

- Tc-99 is so long-lived and mobile.
- There are uncertainties about chemical processing of the waste during the treatment process and in what waste form the Tc-99 will end up.
- There are uncertainties about retention of Tc-99 in the glass during the treatment process.

If Tc-99 removal system were added back in, this would mean restoring WTP's original Tc-99 ion exchange process to incorporate more technetium in HLW glass. This may be advantageous if it would not delay WTP construction and operation and if it would not worsen the secondary waste issue.

View the TC&WM EIS online at <http://www.gc.energy.gov/nepa> or [www.hanford.gov](http://www.hanford.gov)