

Cover Sheet

Responsible Agency: U.S. Department of Energy (DOE)

Cooperating Agencies: Washington State Department of Ecology (Ecology)
U.S. Environmental Protection Agency (EPA)

Title: *Final Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington (TC & WM EIS)* (DOE/EIS-0391)

Location: Benton County, Washington

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Abstract: The Hanford Site (Hanford), located in southeastern Washington State along the Columbia River, is approximately 1,518 square kilometers (586 square miles) in size. Hanford's mission from the early 1940s to approximately 1989 included defense-related nuclear research, development, and weapons production activities. These activities created a wide variety of chemical and radioactive wastes. Hanford's mission now is focused on the cleanup of those wastes and ultimate closure of Hanford. To this end, several types of radioactive waste are being managed at Hanford: (1) high-level radioactive waste (HLW) as defined in DOE Manual 435.1-1; (2) transuranic (TRU) waste, which is waste containing alpha-particle-emitting radionuclides with atomic numbers greater than uranium (92) and half-lives greater than 20 years in concentrations greater than 100 nanocuries per gram of waste; (3) low-level radioactive waste (LLW), which is radioactive waste that is neither HLW nor TRU waste; and (4) mixed low-level radioactive waste (MLLW), which is LLW containing hazardous constituents as defined under the Resource Conservation and Recovery Act (RCRA) of 1976 (42 U.S.C 6901 et seq.). Thus, this environmental impact statement (EIS) analyzes the following three key areas:

1. **Retrieval, treatment, and disposal of waste from 149 single-shell tanks (SSTs) and 28 double-shell tanks (DSTs) and closure of the SST system.** In this *TC & WM EIS*, DOE proposes to retrieve and treat waste from 177 underground tanks and ancillary equipment and dispose of this waste in compliance with applicable regulatory requirements. At present, DOE is constructing a Waste Treatment and Immobilization Plant (WTP) in the 200-East Area of Hanford. The WTP would separate waste stored in Hanford's underground tanks into HLW and low-activity waste (LAW) fractions. HLW would be treated in the WTP and stored at Hanford until disposition decisions are made and implemented. LAW would be treated in the WTP and disposed of as LLW at Hanford as decided in DOE's Record of Decision (ROD) issued in 1997 (62 FR 8693), pursuant to the *Tank Waste Remediation System, Hanford Site, Richland, Washington, Final Environmental Impact Statement* (DOE/EIS-0189, August 1996). DOE

proposes to provide additional treatment capacity for the tank LAW that can supplement the planned WTP capacity in fulfillment of DOE's obligations under the Hanford Federal Facility Agreement and Consent Order (Tri-Party Agreement). DOE would dispose of immobilized LAW and Hanford's (and other DOE sites') LLW and MLLW in lined trenches on site. These trenches would be closed in accordance with applicable regulatory requirements.

2. **Final decontamination and decommissioning of the Fast Flux Test Facility (FFTF), a nuclear test reactor.** DOE proposes to determine the final end state for the aboveground, belowground, and ancillary support structures.
3. **Disposal of Hanford's waste and other DOE sites' LLW and MLLW.** DOE needs to decide where to locate onsite disposal facilities for Hanford's waste and other DOE sites' LLW and MLLW. DOE committed in the ROD (69 FR 39449) for the *Final Hanford Site Solid (Radioactive and Hazardous) Waste Program Environmental Impact Statement, Richland, Washington* (DOE/EIS-0286F, January 2004) that LLW would be disposed of in lined trenches. Specifically, DOE proposes to dispose of the waste in either the existing Integrated Disposal Facility (IDF) in the 200-East Area (IDF-East) or the proposed 200-West Area IDF (IDF-West).

DOE released the *Draft TC & WM EIS* in October 2009 (74 FR 56194) for review and comment by other Federal agencies, states, American Indian tribal governments, local governments, and the public. The comment period was 185 days, from October 30, 2009, to May 3, 2010.

In accordance with Council on Environmental Quality (CEQ) regulations (40 CFR 1502.9(c)) and DOE regulations (10 CFR 1021.314(c)), DOE prepared a supplement analysis (SA) of the *Draft TC & WM EIS (Supplement Analysis of the "Draft Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington"* [DOE/EIS-0391-SA-01, February 2012]). DOE prepared an SA to evaluate updated, modified, or expanded information developed subsequent to publication of the *Draft TC & WM EIS* to determine whether a supplement to the draft EIS or a new draft EIS was warranted. Fourteen topic areas were reviewed. Revisions include changes to contaminant inventories, corrections to estimates, updates to characterization data, and new information that was not available at the time of publication of the *Draft TC & WM EIS*. The modified inventories do not change the key environmental findings presented in the draft EIS. They do not present significant new circumstances or information relevant to environmental concerns and bearing on the proposed action(s) and their impacts. Changes to some of the parameters used in the alternatives analysis do not significantly affect the potential environmental impacts of the alternatives on an absolute or relative basis, whether the changes are considered individually or collectively. These are not substantial changes in the proposed action(s) that are relevant to environmental concerns. DOE concluded, based on analyses in the SA, that the updated, modified, or expanded information developed subsequent to the *Draft TC & WM EIS* does not constitute significant new circumstances or information relevant to environmental concerns and bearing on the proposed actions(s) in the *Draft TC & WM EIS* or their impacts. Therefore, DOE determined that a supplement to the *Draft TC & WM EIS* or a new *Draft TC & WM EIS* was not required.

DOE posted the *Supplement Analysis of the "Draft Tank Closure and Waste Management Environmental Impact Statement for the Hanford Site, Richland, Washington"* on the DOE NEPA website, <http://energy.gov/nepa/office-nepa-policy-and-compliance>, on February 8, 2012, and on the *TC & WM EIS* website, <http://www.hanford.gov/index.cfm?page=1117&>, on February 9, 2012, and the SA was provided on February 14, 2012, to the DOE public reading room at 2770 University Drive, Room 101L, Richland, Washington 99352. The SA is also provided here as Appendix X of this final EIS for convenience only.

In preparing this *Final TC & WM EIS*, DOE considered all comments received on the draft EIS and revised this final EIS, as appropriate. DOE has clarified and/or revised its Preferred Alternatives for the three program areas as presented in this *TC & WM EIS*, as follows:

Tank Closure

Eleven alternatives for potential tank closure actions are evaluated in this final EIS. These alternatives cover tank waste retrieval and treatment, as well as closure of the SSTs. DOE has identified the following Preferred Alternatives: For retrieval, DOE prefers Tank Closure alternatives that would retrieve at least 99 percent of the tank waste. All Tank Closure alternatives would do this except Alternatives 1 (No Action) and 5. For closure of the SSTs, DOE prefers landfill closure; this could include implementation of corrective/mitigation actions as described in the Summary of this EIS, Section S.5.5.1, and Chapter 2, Section 2.10.1, which may require soil removal or treatment of the vadose zone. Decisions on the extent of soil removal or treatment, if needed, will be made on a tank farm– or waste management area–basis through the RCRA closure permitting process. These landfill closure considerations would apply to Tank Closure Alternatives 2B, 3A, 3B, 3C, 5, and 6C. DOE does not prefer alternatives that include removal of the tanks as evaluated in Tank Closure Alternatives 4, 6A, and 6B. As described in the Summary of this EIS, Section S.5.5.1, and Chapter 2, Section 2.10.1, DOE believes that removal of the tank structures is technically infeasible and, due to both the depth of the contamination and the technical issues associated with removal of the tank structures, that it presents significant uncertainty in terms of worker exposure risk and waste generation volume.

DOE does not have a preferred alternative regarding supplemental treatment for LAW; DOE believes it beneficial to study further the potential cost, safety, and environmental performance of supplemental treatment technologies. Nevertheless, DOE is committed to meeting its obligations under the TPA regarding supplemental LAW treatment. When DOE is ready to identify its preferred alternative regarding supplemental treatment for LAW, this action will be subject to NEPA review as appropriate. DOE will provide a notice of its preferred alternative in the *Federal Register* at least 30 days before issuing a ROD. For the actions related to tank waste retrieval, treatment and closure, DOE prefers Tank Closure Alternative 2B, without removing technetium in the Pretreatment Facility.

Although DOE previously expressed its preference that no Hanford tank waste would be shipped to the Waste Isolation Pilot Plant (WIPP) (74 FR 67189), DOE now prefers to consider the option to retrieve, treat, and package waste that may be properly and legally designated as mixed transuranic (TRU) waste from specific tanks for disposal at WIPP, as analyzed in Tank Closure Alternatives 3A, 3B, 3C, 4, and 5. Initiating retrieval of tank waste identified as mixed TRU waste would be contingent on DOE's obtaining the applicable disposal and other necessary permits and ensuring that the WIPP Waste Acceptance Criteria and all other applicable regulatory requirements have been met. Retrieval of tank waste identified as mixed TRU waste would commence only after DOE had issued a *Federal Register* notice of its preferred alternative and a ROD.

FFTF Decommissioning

There are three FFTF Decommissioning alternatives from which the Preferred Alternative was identified: (1) No Action, (2) Entombment, and (3) Removal. DOE's Preferred Alternative for FFTF Decommissioning is Alternative 2: Entombment, which would remove all above-grade structures, including the reactor building. Below-grade structures, the reactor vessel, piping, and other components would remain in place and be filled with grout to immobilize the remaining radioactive and hazardous constituents. Waste generated from these activities would be disposed of in an IDF, and an engineered modified RCRA Subtitle C barrier would be constructed over the filled area. The remote-handled special components would be processed at Idaho National Laboratory and returned to Hanford. Bulk sodium inventories would be processed at Hanford for use in the WTP.

Waste Management

Three Waste Management alternatives were identified for the proposed actions: (1) Alternative 1: No Action, under which all onsite LLW and MLLW would be treated and disposed of in the existing lined Low-Level Radioactive Waste Burial Ground 218-W-5 trenches and no offsite waste would be accepted; (2) Alternative 2, which would continue treatment of onsite LLW and MLLW in expanded, existing facilities and dispose of onsite and previously treated, offsite LLW and MLLW in a single IDF (IDF-East); and (3) Alternative 3, which also would continue treatment of onsite LLW and MLLW in expanded, existing facilities, but would dispose of onsite and previously treated offsite LLW and MLLW in two IDFs (IDF-East and IDF-West). DOE's Preferred Alternative for waste management is Alternative 2, disposal of onsite LLW and MLLW streams in a single IDF (IDF-East). Disposal of SST closure waste that is not highly contaminated, such as rubble, soils, and ancillary equipment, in the proposed River Protection Project Disposal Facility (RPPDF) is also included under this alternative. After completion of disposal activities, IDF-East and the proposed RPPDF would be landfill-closed under an engineered modified RCRA Subtitle C barrier. The final EIS analyses show that, even when mitigation is applied to certain offsite waste streams (e.g., removal of most of the iodine-129), some environmental impacts of small quantities of iodine-129 would still occur and, therefore, limitations for that constituent should apply regardless of the alternative selected.

DOE will continue to defer the importation of offsite waste to Hanford, at least until the WTP is operational, subject to appropriate NEPA review and consistent with its previous Preferred Alternative for waste management (74 FR 67189). The limitations and exemptions defined in DOE's January 6, 2006, Settlement Agreement with the State of Washington (as amended on June 5, 2008) regarding *State of Washington v. Bodman* (Civil No. 2:03-cv-05018-AAM), signed by DOE, Ecology, the Washington State Attorney General's Office, and the U.S. Department of Justice, will remain in place.

This *Final TC & WM EIS* contains revisions and new information based in part on comments received on the *Draft TC & WM EIS*. Sidebars in the margins indicate the locations of these revisions and new information. Minor editorial changes are not marked. Volume 3 contains the comments received on the draft EIS and DOE's responses to the comments. DOE will use the analysis presented in this final EIS, as well as other information, in preparing one or more RODs. DOE will issue a ROD no sooner than 30 days after EPA publishes a Notice of Availability of this *Final TC & WM EIS* in the *Federal Register*.