

**WASTE TREATMENT AND IMMOBILIZATION PLANT  
CHAPTER 3.0  
WASTE ANALYSIS PLAN  
CHANGE CONTROL LOG**

Change Control Logs ensure that changes to this unit are performed in a methodical, controlled, coordinated, and transparent manner. Each unit addendum will have its own change control log with a modification history table. The “**Modification Number**” represents Ecology’s method for tracking the different versions of the permit. This log will serve as an up to date record of modifications and version history of the unit.

Modification History Table

<b>Modification Date</b>	<b>Modification Number</b>
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WASTE ANALYSIS PLAN**

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WASTE ANALYSIS PLAN**

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ACRONYMS

<u>ALARA</u>	<u>As Low As Reasonably Achievable</u>
<u>CRV</u>	<u>Concentrate Receipt Vessel</u>
<u>DOE</u>	<u>US Department of Energy</u>
<u>DST</u>	<u>Double-Shell Tank</u>
<u>DWP</u>	<u>WTP Dangerous Waste Permit</u>
<u>Ecology</u>	<u>Washington State Department of Ecology</u>
<u>EMF</u>	<u>Effluent Management Facility</u>
<u>EPA</u>	<u>US Environmental Protection Agency</u>
<u>ETF</u>	<u>Effluent Treatment Facility</u>
<u>FRP</u>	<u>Waste Feed Receipt Process System</u>
<u>HEME</u>	<u>High-Efficiency Mist Eliminator</u>
<u>HEPA</u>	<u>High-Efficiency Particulate Air (filter)</u>
<u>HLVIT</u>	<u>High-Level Vitrification</u>
<u>HLW</u>	<u>High-Level Waste</u>
<u>ICN</u>	<u>Integrated Control Network</u>
<u>ID</u>	<u>Identification</u>
<u>IHLW</u>	<u>Immobilized High-Level Waste</u>
<u>ILAW</u>	<u>Immobilized Low-Activity Waste</u>
<u>Lab</u>	<u>Analytical Laboratory</u>
<u>LAW</u>	<u>Low-Activity Waste</u>
<u>LDR</u>	<u>Land Disposal Restrictions</u>
<u>LERF</u>	<u>Liquid Effluent Retention Facility</u>
<u>LIMS</u>	<u>Laboratory Information Management System</u>
<u>NRC</u>	<u>US Nuclear Regulatory Commission</u>
<u>PCB</u>	<u>Polychlorinated Biphenyl</u>
<u>PDWRS</u>	<u>Plant Data Warehouse and Reporting System</u>
<u>PIN</u>	<u>Plant Information Network</u>
<u>PPE</u>	<u>Personal Protective Equipment</u>
<u>PT</u>	<u>Pretreatment (Facility)</u>
<u>QA</u>	<u>Quality Assurance</u>
<u>QAPP</u>	<u>Quality Assurance Project Plan for the Waste Analysis Plan</u>
<u>QC</u>	<u>Quality Control</u>
<u>RCRA</u>	<u>Resource Conservation and Recovery Act of 1976</u>
<u>RDQO</u>	<u>Regulatory Data Quality Objectives</u>
<u>SBS</u>	<u>Submerged Bed Scrubber</u>
<u>SDS</u>	<u>Safety Data Sheet</u>
<u>SWTD</u>	<u>Solid Waste Tracking Database</u>
<u>TOC</u>	<u>Total Organic Carbon</u>

<a href="#">TRU</a>	<a href="#">Transuranic</a>
<a href="#">TSD</a>	<a href="#">Treatment, Storage, or Disposal</a>
<a href="#">WAC</a>	<a href="#">Washington Administrative Code</a>
<a href="#">WAP</a>	<a href="#">Waste Treatment Plant Waste Analysis Plan</a>
<a href="#">WESP</a>	<a href="#">Wet Electrostatic Precipitator</a>
<a href="#">WIPP</a>	<a href="#">Waste Isolation Pilot Plant</a>
<a href="#">WTP</a>	<a href="#">Hanford Tank Waste Treatment and Immobilization Plant</a>

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**GLOSSARY**

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2 This Waste Analysis Plan relies on the definitions of terms as contained in Appendix 3B of the Hanford  
3 Facility Dangerous Waste Permit Application, General Information Portion (DOE-RL 2013) and other  
4 portions of the Waste Treatment Plant (WTP) Dangerous Waste Permit (WA7890008967, herein referred  
5 to as the DWP) except as supplemented or amended below.

<u>Batch</u>	<u>A portion (finite volume) of a waste campaign with similar physical and chemical properties where the required waste processing parameters do not vary.</u>
<u>Campaign</u>	<u>Volume of waste feed staged by the Tank Operations Contractor, consisting of multiple batches, that is to be treated using a similar processing strategy.</u>
<u>Dangerous Waste</u>	<u>Solid wastes designated in <b>Washington Administrative Code (WAC) 173-303-070</b> through <b>173-303-100</b> as dangerous, extremely hazardous, or mixed radioactive and dangerous waste. Where information regarding treatment, management, and disposal of the radioactive component of mixed waste has been incorporated it is not incorporated for the purpose of regulating the radiation hazards of such components under this permit (see <b>Condition III.10.A</b>).</u>
<u>Feed Acceptance</u>	<u>Feed acceptance criteria are the technical and administrative requirements that a waste must meet in order for it to be accepted at a storage, treatment, or disposal facility (DOE M 435.1-1, <i>Nuclear Waste Policy Act</i> [DOE 2004], adapted from DOE 5820.2A, <i>Radioactive Waste Management</i>).</u>
<u>Feed Confirmation</u>	<u>The activities the WTP will perform after receiving the waste feed, to confirm that the waste feed received is the same as the waste feed accepted for delivery.</u>
<u>High-Level Waste</u>	<u><b>High-Level Waste</b> or HLW means: (1) irradiated reactor fuel; (2) liquid wastes resulting from the operation of the first cycle solvent extraction system, or equivalent, and the concentrated wastes from subsequent extraction cycles, or equivalent, in a facility for reprocessing irradiated reactor fuel; or (3) solids into which such liquid wastes have been converted (<b>10 Code of Federal Regulations (CFR) 60.2, <i>Disposal of High-Level Radioactive Wastes in Geologic Repositories – Definitions</i></b>). <b>HLW</b> is the highly radioactive waste material resulting from the reprocessing of spent nuclear fuel, including liquid waste produced directly in reprocessing and any solid material derived from such liquid waste that contains fission products in sufficient concentrations; and other highly radioactive material that is determined, consistent with existing law, to require permanent isolation (DOE 2004).</u>
<u>Immobilization</u>	<u>The act or process of reducing the mobility of waste constituents to limit their potential for long-term transport in the biosphere and subsequent exposure to humans, animals, and plants. Vitrification is an example of an immobilization process.</u>
<u>Immobilized Waste</u>	<u>Liquid waste feed that has had its constituents solidified by processing, such as in a <b>Vitrification Plant</b>.</u>
<u>Incidental Waste</u>	<u>Waste resulting from reprocessing spent nuclear fuel that is determined to be incidental to reprocessing is not <b>HLW</b>, and shall be managed under <b>Department of Energy’s (DOE)</b> regulatory authority in accordance with the requirements for transuranic waste or low-activity waste, as appropriate (DOE 2004).</u>

<u>Low-Activity Waste</u>	<u>Low-Activity Waste is radioactive waste that is not high-level radioactive waste, spent nuclear fuel, transuranic waste, byproduct material (as defined in Section 11e.(2) of 42 USC 2011 et seq., Atomic Energy Act of 1954, or naturally occurring radioactive material (DOE 2004).</u>
<u>Mixed Waste</u>	<u>A dangerous, extremely hazardous, or acutely hazardous waste that contains both a nonradioactive hazardous component and, as defined by 10 CFR 20.1003, source, special nuclear, or byproduct material subject to the Atomic Energy Act of 1954 (42 USC 2011 et seq.).</u> <u>Waste that contains both source, special nuclear, or byproduct material subject to the Atomic Energy Act of 1954 (42 USC 2011 et seq.), and a hazardous component subject to the Resource Conservation and Recovery Act (DOE 2004).</u>
<u>Radioactive Waste</u>	<u>10 CFR 60.2 defines radioactive waste as HLW and other radioactive materials other than HLW that are received for emplacement in a geologic repository. Within the context of this document, radioactive waste also includes secondary waste streams, any garbage, refuse, sludges, and other discarded material, including solid, liquid, semisolid, or contained gaseous material that must be managed for its radioactive content. (DOE 2004)</u>

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### 1   **3.0   WASTE ANALYSIS PLAN**

2   The River Protection Project – [Hanford Tank](#) Waste Treatment [and Immobilization](#) Plant ([WTP](#))  
3   Waste Analysis Plan addresses sampling and analysis activities necessary for compliance with the  
4   Washington State Dangerous Waste Regulations contained in Washington Administrative Code, (WAC)  
5   Chapter 173-303.

6   The WTP will be operated in two processing configurations. For near-term operations, WTP will be  
7   operated in a Direct Feed Low-Activity Waste (DFLAW) operating configuration involving the Low  
8   Activity Waste (LAW) Facility, the Effluent Management Facility (EMF), and the Analytical Laboratory  
9   (Lab). In the DFLAW operating configuration, the waste is pretreated within the Hanford tank farms to  
10   remove cesium and solids. In this configuration, the pretreated LAW feed will bypass the Pretreatment  
11   (PT) Facility and be fed directly from the tank farms to the LAW Facility. The LAW Facility is where  
12   the low-activity fraction of the waste is solidified by vitrification. Liquid effluents generated in the LAW  
13   Facility and Lab are transferred and treated at the EMF. EMF will reduce the effluent volume from the  
14   LAW Facility and Lab by evaporation. The WTP Waste Analysis Plan for the DFLAW Configuration is  
15   provided in Chapter 3C.

16   The WTP will later be operated in the baseline WTP operating configuration when the PT Facility and the  
17   High Level Waste (HLW) Facility become operational. The PT Facility will separate LAW and HLW,  
18   pretreat both LAW and HLW, and manage recycle waste streams produced from LAW, HLW and Lab  
19   waste treatment operation. Within the PT Facility, LAW and HLW (including recycles) will be  
20   concentrated by water removal using evaporators; solids will be filtered out of LAW and transferred to  
21   the HLW fraction; and soluble, highly radioactive isotopes (primarily cesium) will be removed from  
22   LAW by ion exchange units and transferred to the HLW fraction. In some situations, prior to filtration,  
23   oxidation and/or precipitation will be used to dissolve solids or remove unwanted components from the  
24   LAW for transfer to the HLW fraction. Treated LAW and HLW will be transferred to the respective  
25   LAW and HLW Facilities for vitrification. The three production process facilities (i.e., PT, LAW, and  
26   HLW) are also supported by the Lab. The ~~Waste Treatment Plant~~ Waste Analysis Plan for the Baseline  
27   Configuration is provided in ~~Appendix~~ Chapter 3A. Information in Chapter 3A will be updated to align  
28   with the Interim Compliance Schedule for PT (Appendix 1.2) and HLW (Appendix 1.5).

29   The Quality Assurance Project Plan (QAPjP) for both the baseline configuration and the DFLAW  
30   configuration ~~for the~~ Waste Analysis Plan is provided in ~~Appendix~~ Chapter 3B. The QAPjP will be  
31   updated to align with the Interim Compliance Schedule for PT (Appendix 1.2) and HLW (Appendix 1.5).

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