

where similar units will be constructed as needed and vehicles used for transport will be temporarily parked.

2.1.1 Removal Site Evaluation

The key problem addressed by this removal action is a limited management capacity for currently generated and future anticipated purgewater. Specifically, there is a need to establish increased capacity for compliant purgewater management. Failure to provide increased capacity could result in the following:

- Potential for increased exposure to the hazardous substances currently in the environment due to delays in investigation and remediation activities
- Potential for an increased threat to human health and the environment from hazardous substances contained in spills of collected purgewater stored at multiple locations throughout Hanford.

Currently a 1-million-gallon-capacity modular storage tank is used to store and treat purgewater through evaporation. The purgewater volume in the tank is approximately 3,331,150 L (880,000 gal.) with only 454,250 L (120,000 gal.) of capacity remaining. The annual evaporation rate for purgewater from the modular storage unit is approximately 3,785,400 liters (1 million gallons).

As shown in Figure 1, the forecasted purgewater volume peaks in fiscal year 2010, exceeding the existing capacity by more than 15,141,600 liters (4 million gallons), and tapers off dramatically for the remainder of the project. Purgewater volume forecasts were updated in 2018 indicating increasing amounts of purgewater will be produced and exceed the capacity of the existing two modular storage units.

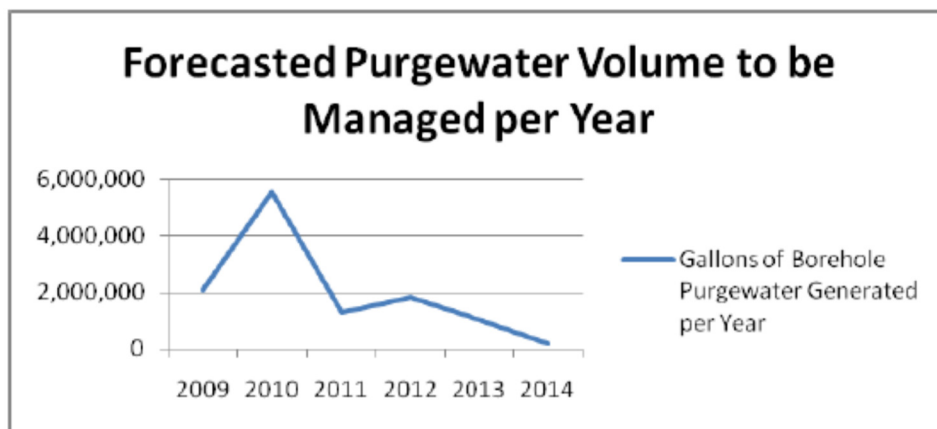


Figure 1. Forecasted Purgewater

2.1.2 Physical Location

The hazardous substances of concern for this removal action are contained in purgewater generated across the Hanford Site during the implementation of Tri-Party Agreement work. Purgewater is currently collected and managed at or near the source, then transferred for consolidation at a central location that has been in service for nearly 20 years.

The investigation and remediation of NPL sites under the Tri-Party Agreement necessitates the continued generation and management of purgewater that must be managed either at the generating site or at a designated location, consistent with the approach agreed to by the Tri Parties.

2.1.3 Site Characteristics

The modular storage units will include refurbishing an existing but never used unit located adjacent to the operating 600 Area Purgewater Storage and Treatment Facility near the 200 East Area of the Hanford Site near Richland, Washington and installing additional units. The modular storage units will be designed for purgewater storage through the use of primary and secondary high-density polyethylene liners separated by a geotextile drainage media and supported by metal walls and a structural support. The drainage media is interconnected to a leachate detection system consisting of a standpipe with measurable depth and sampling capability. The refurbishment design will be similar to the adjacent operating unit. The dimensions will be approximately 61 m (200 ft) by 61 m (200 ft) with storage capacity of approximately 3.8 million L (1 million gal). The area is surrounded by a fence, bermed, and has a graveled roadway. Parking for the vehicles used to transport the purgewater to the modular storage units will also be established. A pump filter skid may be established next to the modular storage units with the ability to pump water to a tanker truck or transfer pipeline.

2.1.4 Release or Threatened Release into the Environment of a Hazardous Substance, Pollutant, or Contaminant

The hazardous substances addressed by this Action Memorandum already have been released to the environment and are generated with purgewater during the implementation of NPL and Tri-Party Agreement work. Inadequate capacity for management of this purgewater has the potential to cause delays in developing groundwater-monitoring wells, purging existing wells for sample collection, and developing pump-and-treat systems to mitigate the threat of further release of hazardous substances contained in the groundwater.

The purgewater potentially contains hazardous substances including, but not limited to, the following chemical constituents:

- Carbon tetrachloride in a groundwater plume
- Methanol in the 100-N Area wells
- 1,1,1-trichloroethane, methylene chloride, acetone, methyl isobutyl ketone, total cresols, and methyl ethyl ketone in Single-Shell Tank System wells in the 200 East and 200 West Areas.

In addition to chemical constituents, analysis of soil and purgewater from groundwater wells has identified low levels of the following radiological constituents: actinium-228, americium-241, bismuth-212, bismuth-214, cesium-134, cesium-137, cobalt-60, europium-155, lead-212, lead-214, plutonium-238, plutonium-239/240, radium-226, radium-228, strontium-90, technetium-99, thallium-208, thorium-228, thorium-234, tritium, uranium-233/234, uranium-235, and uranium-238.

Information on the detectable levels of radiological and chemical constituents contained in purgewater may be found in the DOE/RL-2008-66, *Hanford Site Groundwater Monitoring for Fiscal Year 2008* and subsequent annual reports.

2.1.5 NPL Status

The Hanford Site includes many waste sites identified through four separate NPL listings in 1989. The purgewater requiring management under this removal action contains hazardous substances from the NPL sites subject to investigation and cleanup under the Tri-Party Agreement.

5 Proposed Action and Estimated Cost

This removal action utilizes an action-based approach that will provide for purgewater management in accordance with ARARs to the extent practicable (Appendix A). The selected removal action consists of re-lining the existing unused modular storage unit, ~~and building additional storage units,~~ establishing a pumping and filtration skid, and installing a transfer pipeline as needed for dedicated use in purgewater collection and management from implementation of the Tri-Party Agreement and eventual demolition of the modular storage units.

5.1 Proposed Action

The purgewater will be collected transported, and consolidated in the modular storage units (described in Section 2.1.3) for management in support of work performed under the Tri-Party Agreement. This action is selected based on the following factors:

1. The immediate refurbishment of the previously unused unit will provide the quickest and most cost-effective approach to prevent and eliminate the threat of release to the environment.
2. The planned methodology for purgewater management under this action has been demonstrated to be safe and effective for interim purgewater management through the use of another, similar unit over the past 19 years.
3. The modular storage units provide readily available storage capacity for upcoming work planned under the Tri-Party Agreement.
- ~~3.4. Transfer pipelines and purgewater trucks have been used successfully to safely transport untreated groundwater between locations and is a cost effective approach to transport modular storage tank water to the 200 West Pump and Treat facility.~~

The existing unit will be re-lined with two high-density flexible membrane liners separated by a geotextile layer and a leak detection system that provides both measuring and sampling capability. Parking for the vehicles used to transport the purgewater to and/or from the modular storage units will be established as appropriate. Monitoring of the leak detection system will be implemented with routine/scheduled evaluations performed to determine whether additional monitoring associated with groundwater is necessary. In the fourth year of use of the modular storage units, EPA and RL will evaluate the continued usage of the modular storage units and determine if improved methods for purgewater management should be employed for the longer term. If the modular storage units will be used after five years or if there is evidence of leakage from the modular storage units to the environment, RL will implement groundwater monitoring. The estimated cost for drilling groundwater monitoring wells is \$915,000. The modular storage units will be operated in accordance with the regulatory standards for miscellaneous units to ensure purgewater management will be protective of human health and the environment. Upon completion of service, the modular tank units will be disassembled and dispositioned in a manner that minimizes the need for further maintenance, is protective, and returns the land to the appearance and use of surrounding land areas to the degree possible, given the nature of the activity. Design, operation, and closure standards for the removal action are addressed in detail in Appendix A.

5.1.1 Contribution to Remedial Performance

This removal action contributes to the efficient performance of any long-term remedial action by:

- Addressing the threat of release from management of current and future anticipated increases in purgewater generation

- Providing direct support to the effort to investigate and remediate Hanford NPL sites.

5.1.2 Description of Alternate Technologies

Other alternate technologies were evaluated in DOE/RL-2009-31 and are listed in Section 5.1.3. The purgewater can be safely and efficiently managed onsite in a previously constructed, but unused modular storage unit, with construction of additional units as needed. This was the only alternative that met the short-term effectiveness needs for the project. As stated in section 9.0 and in Appendix B, the other alternatives in DOE/RL-2009-31 for long-term purgewater management will continue to be pursued. A variation of alternative 2 in Section 5.1.3 was pursued in DOE/RL-2018-28, Optimization Test Plan for Treating Water from Modular Units at 200 West Pump & Treat Facility. Modular storage unit water was successfully transported to the 200 West Pump and Treat facility by truck and transfer pipeline as detailed in DOE/RL-2018-70, Optimization Pilot Test Results of Treating Water from Modular Storage Units at 200 West Pump & Treat Facility.

5.1.3 Engineering Evaluation/Cost Analysis

The key objective of this removal action is to remove the potential threat presented by purgewater contaminants that are generated through Tri-Party Agreement work in support of the implementation of remedial actions required by the 40 CFR 300, “National Oil and Hazardous Substances Pollution Contingency Plan” (NCP) and Tri-Party Agreement. Based on the potential hazards identified in Section 2.1.4, the specific removal objectives are as follows.

- Reduce or eliminate the potential for public exposure to hazardous substances in purgewater above levels that are protective of human health and environment.
- Reduce or eliminate the potential for release of hazardous substances from purgewater management.
- Prevent adverse impacts to cultural and natural resources.

The removal action for purgewater management must be protective of human health and the environment, and otherwise meet the removal objectives. Based on these considerations, the following five action alternatives were evaluated in DOE/RL-2009-31:

- Alternative 1: No Action
- Alternative 2: Transport Purgewater Directly to a Groundwater Operable Unit Pump-and-Treat Facility
- Alternative 3: Use Modular Storage Units for Purgewater Management
- Alternative 4: Discharge Purgewater at or Near Source
- Alternative 5: Transport Purgewater Directly to the 200 Area Effluent Treatment Facility.

The current site problem is specific to ongoing work and is well understood. The issue is limited to one of facilitating purgewater management anticipated to be generated during future Tri-Party Agreement work. There is no need to collect additional data to determine the specific need for action. Therefore, the removal objectives will be best met through the implementation of an action-based approach.

5.1.4 ARARs and Other Criteria, Advisories, or Guidance to be Considered

The NCP requires that the removal action described in this document comply with ARARs to the extent practicable. Applicable or relevant and appropriate requirements are environmental standards incorporated in promulgated regulations that have been evaluated to be pertinent to the removal action. Appendix A identifies specific regulatory sections in each overarching regulation, which is an ARAR. Each citation includes an explanation as to why it is an ARAR. In addition, “to be considered” (TBC) information consists of nonpromulgated advisories or guidance issued by Federal or State governments that are not legally binding and do not have the status of ARARs. However, regulations and guidance state that, as appropriate, TBCs should be considered in determining the removal action necessary for protection of human health and the environment. No TBCs are being considered for this removal action.

5.2 Project Schedule

The removal action operations for the modular storage units are scheduled to begin in August 2009. As stated in Section 5.1, in the fourth year of use of the modular storage units, EPA, Ecology, and RL will evaluate the continued usage of the modular storage units and determine if improved methods for purgewater management should be employed for the longer term. If the modular storage units will be used after 5 years or if there is evidence of leakage from the modular storage units to the environment, RL will implement groundwater monitoring.

A removal action work plan will be submitted for approval. The work plan will contain detailed design information, a field execution schedule, and information on implementation of the ARARs, including management and air emissions.

5.3 Estimated Cost

The summarized cost estimates are shown in Table 1, which includes a projection of costs over the operation period (approximately 5 years). The total cost in today’s dollars is approximately \$10,995,000. A transfer pipeline was installed in fiscal year 2019 for the transportation of modular storage unit water to the 200 West Pump and Treat facility at a cost of about \$400,000. SGW-61673, Treatment of Modutank Water at 200 West Pump & Treat, estimated operations and maintenance over a 5-year period for transporting modular storage unit water at a cost of \$852,840. The cost for transfer pipeline installation and operation is in addition to the costs in Table 1.

Table 1. Alternative 3 – Use Modular Storage Units for Purgewater Management

	Item	Estimated Cost (\$)	Comments
1	System Installation	\$3,738,000	Includes removal of existing Unit 2 liner and installation of new liner in existing 3,716-m ² (40,000-ft ²) tank structure – supply and installation of three new 3,716-m ² (40,000-ft ²) modular storage-type tanks and liners on new concrete ring slab and graded gravel floor surface. Regrade one new tank site. Other tanks will use previously graded sites.
2	O&M	\$4,260,000	Over a 5-year plant life, includes all O&M costs based on cost analysis for FY 2006, FY 2007, and FY 2008 of \$213,000/year for each tank.

As stated in this section below and in Appendix B, the other alternatives in DOE/RL-2009-31 for long-term purgewater management will continue to be pursued. A variation of alternative 2 in Section 5.1.3 was pursued in DOE/RL-2018-28. Modular storage unit water was successfully transported to the 200 West Pump and Treat facility by truck and transfer pipeline as detailed in DOE/RL-2018-70.

Conditions on the Hanford Site meet the NCP Section 300.415(b)(2) criteria for a removal and this action is approved by RL. The total project costs are estimated at \$10,995,000.

Although Alternative 3 was selected because it was the most effective alternative in the short-term, other alternatives for long-term purgewater management will continue to be pursued.

10 References

40 CFR 300, “National Oil and Hazardous Substances Pollution Contingency Plan,” *Code of Federal Regulations*. Available at: http://www.access.gpo.gov/nara/cfr/waisidx_03/40cfr300_03.html.

- 40 CFR 300.415, “Removal Action.”
- 40 CFR 300.440, “Procedures for Planning and Implementing Off-Site Response Actions.”

40 CFR 300, “National Oil and Hazardous Substances Pollution Contingency Plan,” Appendix B, “National Priorities List,” *Code of Federal Regulations*. Available at: http://edocket.access.gpo.gov/cfr_2008/julqtr/40cfr141.50.htm.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 U.S.C. 9601, et seq. Available at: <http://www.epa.gov/superfund/policy/cercla.htm>.

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cleanup of the Hanford Site. According to the ESD, the ERDF is eligible for disposal of any low-level radioactive waste (LLW), mixed waste, and hazardous/dangerous waste generated as a result of cleanup actions, provided the waste meets ERDF waste acceptance criteria and appropriate CERCLA decision documents are in place.

Aqueous waste designated as LLW, dangerous, or mixed waste that is removed from the modular storage units would be transported to the 200 Area Effluent Treatment Facility (ETF) for treatment and disposal with an approved offsite determination. The ETF is a RCRA-permitted facility authorized to treat aqueous waste streams generated on the Hanford Site and dispose of these streams at a designated state-approved land disposal facility in accordance with applicable requirements.

In addition, water from the modular storage units can be transported to the 200 West Pump and Treat facility. The 200 West Pump and Treat is considered to be onsite for management and/or disposal of waste from removal actions proposed in this document². Construction and operation of the 200 West Pump and Treat was authorized using a separate CERCLA Record of Decision, EPA et al., *Record of Decision Hanford 200 Area 200-ZP-1 Superfund Site, Benton County, Washington.*

Standards Controlling Emissions to the Environment

The state implementing regulation WAC 173-480, “Ambient Air Quality Standards and Emission Limits for Radionuclides,” sets standards that are as stringent or more than the federal *Clean Air Act of 1990* and Amendments (42 USC 7401 et seq.), and under the federal implementing regulation, 40 CFR 61, Subpart H, “National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities.” The EPA partial delegation of the 40 CFR 61 authority to the State of Washington includes all substantive emissions monitoring, abatement, and reporting aspects of the federal regulation. The state standards protect the public by conservatively establishing exposure standards applicable to even the maximally exposed public individual, be that individual real or hypothetical. To that end, the standards address any member of the public, at the point of maximum annual air concentration in an unrestricted area where any member of the public may be located. Radionuclide airborne emissions from the DOE Hanford Site “facility” are not to exceed amounts that would cause an exposure to any said member of the public of greater than 10 mrem/yr effective dose equivalent. The state implementing regulation WAC 246-247, “Radiation Protection – Air Emissions,” adopts the WAC 173-480 standards and the 40 CFR 61, Subpart H standard, and requires verification of compliance with the 10 mrem/yr standard, and would be applicable to the remedial action.

WAC 246-247 further addresses emission sources emitting radioactive airborne emissions by requiring monitoring of such sources. Such monitoring requires physical measurement of the effluent or ambient air. The substantive provisions of WAC 246-247 that require monitoring radioactive airborne emissions would be applicable to the remedial action.

² CERCLA Section 104(d)(4) states that, where two or more noncontiguous facilities are reasonably related on the basis of geography, or on the basis of the threat or potential threat to the public health or welfare or the environment, the President may, at his discretion, treat these facilities as one for the purpose of this section. The preamble to the “National Oil and Hazardous Substances Pollution Contingency Plan” (40 CFR 300) clarifies the stated EPA interpretation that when noncontiguous facilities are reasonably close to one another, and wastes at these sites are compatible for a selected treatment or disposal approach, CERCLA Section 104(d)(4) allows the lead agency to treat these related facilities as one site for response purposes and, therefore, allows the lead agency to manage waste transferred between such noncontiguous facilities without being required to obtain a permit. Therefore, the 200 West Pump and Treat is considered to be onsite for response purposes under this removal action. It should be noted that the scope of work covered in this removal action is for a facility and waste contaminated with hazardous substances. Materials encountered during implementation of the selected removal action that are not contaminated with hazardous substances will be dispositioned by DOE.

Table A-2. Identification of State ARARs for the Removal Action

ARAR Citation	Requirement	Rationale for Use
ALARA	= as low as reasonably achievable	
ALARACT	= as low as reasonably achievable control technology	
CERCLA	= <i>Comprehensive Environmental Response, Compensation and Liability Act of 1980</i>	
CFR	= <i>Code of Federal Regulations</i>	
RACT	= reasonably available control technology	
RCRA	= <i>Resource Conservation and Recovery Act of 1976</i>	
WAC	= <i>Washington Administrative Code</i>	

National Environmental Policy Act

This Action Memorandum documents approval of a DOE non-time-critical removal action to manage purgewater at the Hanford Site. The proposed action (as identified in Section 5 of this Action Memorandum) consists of re-lining the existing modular storage unit, building additional storage units as needed for dedicated use in the collection and management of purgewater, operation of the unit(s), transfer of water to the 200 West Pump and Treat, and eventual demolition of the units.

Under DOE's *National Environmental Policy Act of 1969* (NEPA) compliance program (DOE O 451.1B, Section 5.a.[13]), DOE will "...incorporate NEPA values, such as analysis of cumulative, off-site, ecological, and socioeconomic impacts, to the extent practicable, in DOE documents prepared under the Comprehensive Environmental Response, Compensation, and Liability Act." The NEPA values associated with management of Hanford Site purgewater were generally summarized in Appendix A of DOE/RL-2009-31, *Investigation Derived Waste Purgewater Management Engineering Evaluation/Cost Analysis*. The aforementioned NEPA values were based on considering the more detailed information presented in the DOE/RL-2009-31 CERCLA Evaluation Criteria, the DOE/RL-2009-31 discussion of the specific site characterization (Chapter 2), the release or threatened release of hazardous substances (Section 2.3), and alternative removal actions (Chapters 4 and 5). Applying a "sliding scale" of NEPA analysis to the management of purgewater (using DOE's 2004, *NEPA Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements*), and considering the CERCLA ARARs (previously detailed in this appendix), the principal resource areas of concern include the contaminants in the purgewater, solid and liquid radioactive and hazardous waste management, air emissions, potential adverse effects to historic and cultural resources, ecological resources, socioeconomics (including environmental justice concerns), and transportation.

For purposes of implementing the preferred removal actions, when purgewater and demolition wastes are found to be contaminated with hazardous substances in concentrations presenting a material threat to human health and the environment, that threat will be mitigated by meeting the applicable ARAR standards as well as following current DOE policy and guidance. The net anticipated effect could be a positive contribution to cumulative environmental effects at the Hanford Site through removal, treatment and disposal of such hazardous substances and contaminants of concern into a facility that has been designed and legally authorized to safely contain such contaminants. The purgewater would be collected and consolidated in modular storage units (Section 4.3). The DOE expects that the primary facility to receive demolition waste will be the ERDF. The NEPA values in the planning for the ERDF operation are explained in detail in DOE/RL-94-41, *NEPA Roadmap for the Environmental Restoration Disposal Facility Regulatory Package*, for the ERDF remedial investigation/feasibility study (DOE/RL-93-99 *Remedial Investigation and Feasibility Study Report for the Environmental Restoration Disposal Facility*)

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