U.S. Department of Energy
Hanford Field Office
P.O. Box 550
Richland, Washington 99352

June 3, 2025

25-PFD-0021

Anne McCartney, Remedial Project Manager
Hanford Project Office
U.S. Environmental Protection Agency
825 Jadwin Avenue, Suite 210
Richland, Washington 99352

Dear Ms. McCartney:

TRANSMITTAL OF PROPOSED PLAN TO AMEND THE HANFORD SITE 300 AREA RECORD OF DECISION FOR 300-FF-2 TO ADDRESS CHANGED FIELD CONDITIONS AT THE 300-296 WASTE SITE, DOE/RL-2024-34, REVISION 0

This letter transmits the Proposal Plan to Amend the Hanford Site 300 Area Record of Decision for 300-FF-2 to Address Change Field Conditions at the 300-296 Waste Site, DOE/RL-2024-32, Revision 0, and the associated Review Comment Record, to the U.S. Environmental Protection Agency.

If you have any questions please contact me, or you may contact Kelly Ebert, Director, Project and Facilities Division, at (509)376-7756.

Sincerely,

HEATHER DALE

Digitally signed by HEATHER DALE
Date: 2025.06.03 14:31:31 -07'00'

Heather L. Dale, Assistant Manager
for River and Plateau

SGD:BWV

Attachments

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M. D. Jones, Ecology
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Administrative Record (300-FF-2, M-016-85A, M-016-85)
Environmental Portal
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cc w/o attach:
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L. K. O'Mara, CPCCo
M. J. Turner, HMIS

Attachment 1
25-PFD-0021

Proposed Plan to Amend the Hanford Site 300 Area Record of Decision for 300-FF-2 to Address Changed Field Conditions at the 300-296 Waste Site DOE/RL-2024-34 Revision 0

(35 pages including cover sheet)

DOE/RL-2024-34
Revision 0

Proposed Plan to Amend the Hanford Site 300 Area Record of Decision for 300-FF-2 To Address Changed Field Conditions at the 300-296 Waste Site

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract 89303320DEM000030

P.O. Box 1464
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

DOE/RL-2024-34
Revision 0

Proposed Plan to Amend the Hanford Site 300 Area Record of Decision for 300-FF-2 To Address Changed Field Conditions at the 300-296 Waste Site

Date Published
May 2025

Prepared for the U.S. Department of Energy
Assistant Secretary for Environmental Management

Contractor for the U.S. Department of Energy
under Contract 89303320DEM000030

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APPROVED
By Janis Aardal at 4:13 pm, May 29, 2025

Release Approval | Date

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PROPOSED PLAN TO AMEND THE HANFORD SITE 300 AREA RECORD OF DECISION FOR 300-FF-2 TO ADDRESS CHANGED FIELD CONDITIONS AT THE 300-296 WASTE SITE

DOE/RL-2024-34, Rev. 0
June 2025

INTRODUCTION

The U.S. Department of Energy (DOE) and the U.S. Environmental Protection Agency (EPA) invite public and Tribal Nations comments on this ***Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA) Proposed Plan*** presenting a revised remedial action to address contaminated soil from a release of radioactive liquids known as the 300-296 ***waste site***. The release was discovered in 2009 and resulted from historical research operations in the Chemical Materials Engineering Laboratory (more commonly known as the 324 Building) in the Hanford Site 300 Area. The release of radioactive liquids occurred through a seam in a ***hot cell*** floor and into soil directly beneath the building. A hot cell is a shielded enclosure that allows researchers to safely handle and study radioactive materials remotely.

The original remedial action for the 300-296 waste site was established in the *Hanford Site 300 Area Record of Decision for 300-FF-2 and 300-FF-5, and Record of Decision Amendment for 300-FF-1*, hereinafter referred to as the 2013 ***Record of Decision (ROD)*** (EPA et al., 2013). The overall remedial action is to ***remove, treat as necessary, and dispose (RTD)*** the contaminated soil from the 300-296 waste site to achieve the ***remedial action objectives (RAOs)*** and associated soil ***cleanup levels (CULs)*** outlined in the 2013 ROD.

The 2013 ROD (EPA et al., 2013) included language describing a "coupled" approach utilizing portions of the 324 Building to support remotely excavating 300-296 contaminated soil as an initial step of implementing the RTD remedy. Since the original decision in 2013, an updated understanding of the site conditions restricts the ability to implement the 2013 remedy as originally envisioned and has prompted DOE and EPA to reassess the planned actions.

DOE and EPA have agreed that RTD will continue to be the fundamental element for the 300-296 remedial action. Alternatives other than RTD are excluded from consideration. In addition, the RAOs and CULs established in the 2013 ROD (EPA et al., 2013) will remain unchanged. Whether or not to proceed with using the 324 Building to support an initial stage of the 300-296 RTD operation is the question being evaluated through development of alternatives to identify and propose a safe, effective, and implementable modification of the existing remedial action.

Public Comment Period
June 9 through July 9, 2025

How to Participate

Read this Proposed Plan and review documents available in the Administrative Record: http://pdw.hanford.gov/.

Comment on this Proposed Plan (mail or email) by July 9, 2025.

Dana Gribble
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Refer to page 21 for more information on public involvement.

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This Proposed Plan considers a change to the remedial action only for the 300-296 waste site. Other waste sites that were part of the 2013 ROD (EPA et al., 2013) are excluded from any changes as part of this Proposed Plan. Similarly, ***groundwater*** cleanup requirements throughout the 300 Area are unaffected by any of the revised 300-296 waste site remedial action approaches discussed in this Proposed Plan.

The 324 Building will be demolished as part of a CERCLA removal action and is excluded from the scope of this Proposed Plan. However, the estimated duration of 324 Building demolition activities is considered in this Proposed Plan when estimating the timeline to achieve the RAOs for new remedial action alternatives. The outcome of a decision for a modified remedial action for the 300-296 waste site will also affect the sequence and timing for demolition of the 324 Building. During the time period between completion of 324 Building demolition activities and the start or continuation of 300-296 excavation activities, measures will be taken to prevent contaminant mobilization (e.g., managing water infiltration in the vicinity of the waste site, applying fixatives or cover material to surface as needed).

This Proposed Plan explains DOE and EPA's recommended changes to the remedial action for public and Tribal Nations review and comment. For those members of the public who wish to evaluate this proposal in more detail, they are encouraged to consult the documents found in the information repositories listed in the "Community Participation" section of this Proposed Plan. The repositories also hold copies of the original 2013 ROD (EPA et al., 2013) and its supporting documentation.

Public input on the proposed changes and the information that supports the changes is an important contribution to the cleanup plan selection process. Both DOE and EPA encourage the public and Tribal Nations to review and comment on the proposed changes to the 300-296 waste site cleanup plan as presented in this Proposed Plan. Opportunities to comment include a public meeting (see side bar) and a prepaid comment form at the back of this document. At the conclusion of the comment period and after consideration of submitted comments, a ***ROD Amendment*** will be issued by DOE and EPA formally adopting a new remedial action and modifying the affected elements of the 2013 ROD (EPA et al., 2013).

Preferred Alternative

Two remedial action alternatives were developed and considered in the focused feasibility study (FFS) report (DOE/RL-2024-33, *Focused Feasibility Study for Remedial Action at the 300-296 Waste Site*) after examining current field conditions and the original remedial action approach. Both alternatives meet the statutory requirements under CERCLA and ***Code of Federal Regulations*** (CFR), 40 CFR 300, "***National Oil and Hazardous Substances Pollution Contingency Plan***" (commonly known as the "National Contingency Plan" [NCP]), to select remedies that are protective of human health and the environment and comply with ***applicable or relevant and appropriate requirements (ARARs)***, are cost-effective, and use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. A "***No Action*** Alternative" was not considered in the FFS since the alternative had previously been considered in the 2013 ROD (EPA et al., 2013) and found to not meet the threshold criteria required for selection of a final remedial alternative.

One alternative is called the "Coupled Alternative," which retains a key element of the original remedy by continuing to use the 324 Building and ***remote excavation arms (REAs)*** attached to its hot cells for the initial excavation of contaminated soil through the B Cell floor. Once the excavation limits of the REAs are reached, the 324 Building would be demolished and disposed. Remaining excavation work would then be completed under a ***temporary waste retrieval enclosure.***

A second alternative, called the "Decoupled Alternative," does not use the 324 Building for excavation support. After the demolition and disposal of the 324 Building as a first step, the 300-296 waste site excavation would be performed entirely under a temporary waste retrieval enclosure.

The ***preferred alternative*** identified in this Proposed Plan is the Decoupled Alternative, which provides the best balance of tradeoffs based on the criteria specified in the NCP. This alternative has less project execution risks, achieves the cleanup objectives in less time, and costs less to implement in comparison with attempting to perform a portion of the remedy using the 324 Building for support. The Decoupled Alternative avoids added cost and time required to maintain the building in a ready-to-support status and perform building and equipment upgrades. In addition, reliance on use of the 324 Building to perform the Coupled Alternative involves inherent worker exposures to additional radiological and industrial hazards that must be accounted for in planning and

execution for maintenance activities and upgrades that are not needed under the Decoupled Alternative. Both alternatives are described in the "Summary of Remedial Alternatives" section of this Proposed Plan and more fully in the FFS report (DOE/RL-2024-33).

Tribal Nations and Public Involvement

Input from the Tribal Nations and the public on this Proposed Plan and the supporting analysis and information in the ***Administrative Record*** will be considered in selecting the revised remedial action for the 300-296 waste site. In accordance with CERCLA, a ROD Amendment will be issued by DOE and EPA and will identify the final alternative selected for implementation. Comments will be accepted during the comment period (see sidebar). For additional information on how to participate, see the "Community Participation" section of this Proposed Plan.

The Proposed Plan summarizes information that can be found in greater detail in the FFS report (DOE/RL-2024-33). The FFS report summarizes the development and analysis of ***remedial alternatives*** and can be accessed online and at the various information repositories identified in the "Community Participation" section of this Proposed Plan. The FFS report and supporting information that form the basis for the preferred remedial alternative are contained in the Administrative Record. An index of the documents and supporting information for the 300-296 waste site is contained in the Administrative Record at https://pdw.hanford.gov/document/AR-34152.

After all input submitted during the comment period has been reviewed and considered, a ROD Amendment will be issued that identifies the selected remedial action. This input could result in the selection of a remedial action that differs from the preferred alternative. A summary of significant comments and responses will be published in a ***Responsiveness Summary*** issued with the ROD Amendment.

Agencies' Role

DOE is the lead agency and is responsible for implementing the selected remedial action. DOE is issuing this Proposed Plan as part of the public participation requirements described under Section 117(a), "Public Participation," "Proposed Plan," of CERCLA (commonly known as "Superfund") and the NCP under 40 CFR 300.430(f)(2), "***Remedial Investigation/Feasibility Study*** and Selection of Remedy." CERCLA establishes the federal authority for conducting cleanup at Superfund sites, and the NCP (40 CFR 300) includes the procedures and expectations for cleanup.

EPA and the Washington State Department of Ecology (Ecology) provide regulatory oversight of the Hanford Site cleanup. EPA is the lead regulatory agency for the 300 Area, and Ecology is the non-lead regulatory agency per Ecology et al., 1989, *Hanford Federal Facility Agreement and Consent Order* (***Tri-Party Agreement***), and the support agency. DOE, EPA, and Ecology are collectively referred to as the ***Tri-Party Agreement Agencies*** in this Proposed Plan. DOE prepared this Proposed Plan in conjunction with EPA.

Proposed Plan Organization

The subsequent sections of this Proposed Plan include the following information:

- **Site Background**: Provides information about site contamination, investigations, and previous participation by Tribal Nations and the public.
- **Site Characteristics**: Describes land and groundwater use, physical features influencing remedy selection, and the nature and extent of contamination.
- **Scope and Role of the Action**: Discusses how remedial actions fit into the overall Hanford Site cleanup strategy.
- **Summary of Site Risks**: Identifies the ***contaminants of concern***, results of the ***baseline risk assessment***, and land and groundwater use assumptions.
- **Remedial Action Objectives**: Describes what the proposed remedial actions are expected to accomplish.
- **Summary of Remedial Alternatives**: Identifies the cleanup options that were developed for attaining the RAOs.

- **Evaluation of Alternatives**: Provides a comparison of the cleanup options based on the CERCLA evaluation criteria.
- **Community Participation**: Provides information on how the Tribal Nations and the public can provide input to the remedy selection process.
- **Acronym List**: Provides an alphabetical list of the acronyms used in this Proposed Plan and the longer name or term for which the acronym was developed.
- **Glossary**: Provides an alphabetical list of technical and administrative terms used in the Proposed Plan and their description or definition.
- **References**: Provides an alphabetical list of information cited, paraphrased, or quoted in this Proposed Plan.

SITE BACKGROUND

Location and History

The 300 Area is in the southeast portion of the Hanford Site and includes an approximately 400 acre industrial complex where fuel manufacturing operations took place during the plutonium production years of 1944 to 1989 and experimental studies were conducted in laboratory facilities. CERCLA removal actions and remedial actions have been previously implemented in the 300 Area to demolish most of the facilities supporting the 300 Area mission and to excavate most of the waste sites resulting from historical operational releases or waste management practices.

The Chemical Materials Engineering Laboratory, more commonly known as the 324 Building, is a concrete and steel structure constructed from 1964 to 1966 with a partial basement and first, second, and partial third floors surrounding an engineering hot cell complex (Figure 1). The foundation for the 324 Building is poured-in-place steel reinforced concrete. The building provided office and laboratory space for scientific and engineering staff who conducted multi-disciplinary research in areas of waste characterization and immobilization, waste remediation and cleanup development, biomass research, spent fuel characterization, tritium development, and cesium chloride encapsulation. The work being conducted in the 324 Building changed over its operating years as programs were concluded and other programs started.

The 324 Building is one of the last major facilities present in the 300 Area industrial complex and is adjacent to an operating Pacific Northwest National Laboratory nuclear facility. Disposition, including eventual demolition of the 324 Building, will be addressed as part of the CERCLA removal actions that have been implemented for most of the other 300 Area facilities (DOE/RL-2004-77, *Removal Action Work Plan for 300 Area Facilities*).

A release of ***radionuclide*** contamination beneath one of the 324 Building hot cells (known as B Cell) was discovered during preparatory activities for building demolition. During cleanout of B Cell in 2009, a hole was discovered in the stainless-steel sump liner. Direct radiological measurements at the failed sump location in the bottom of the cell measured approximately 8,900 R/hr. A review of construction as-built drawings identified an expansion joint in the underlying concrete slab in the vicinity of the hole in the sump liner. The co-location of the hole and expansion joint prompted concerns that contamination from highly radioactive solutions used in the hot cell may have been released to the environment from the failed sump liner.

The release was assigned waste site identification number 300-296 as part of the 300-FF-2 Source ***Operable Unit (OU)*** within the 300 Area National Priorities List site. Waste sites within the 300 Area National Priorities List site are addressed in the 300-FF-1 and 300-FF-2 source OUs while underlying groundwater is addressed in the 300-FF-5 OU.

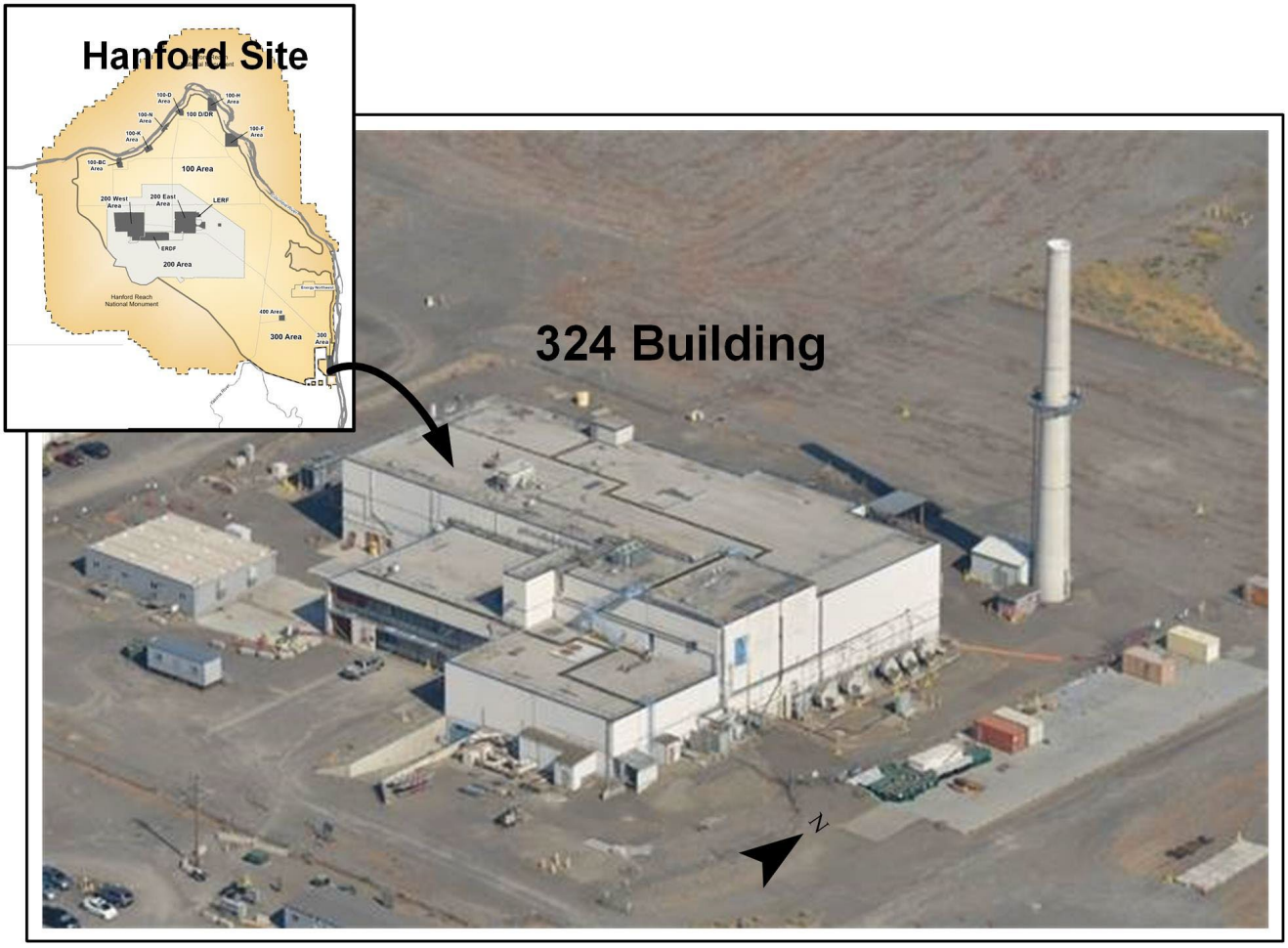

Figure 1. Hanford Site 300 Area and 324 Building and Location

Previous and Decisions and Cleanup Actions

The 2013 remedial investigation/feasibility study (RI/FS) report (DOE/RL-2010-99, *Remedial Investigation/Feasibility Study for the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units*) summarized investigations that had been performed in the 300 Area, including those to date for the 300-296 waste site. It included an evaluation of remedial alternatives for the area. The RI/FS report and Proposed Plan (DOE/RL-2011-47, *Proposed Plan for Remediation of the 300-FF-1, 300-FF-2, and 300-FF-5 Operable Units*) supported a final action ROD that was issued in November 2013. The ROD integrated the 300 Area National Priorities List decisions.

Remediation of the 300-296 waste site soil below the 324 Building was specifically addressed in the 2013 ROD (EPA et al., 2013), with RTD identified as the selected remedy consistent with other waste sites in the 300 Area. Institutional controls, which are managed by DOE, were also a component of the remedy decision for 300 Area waste sites, including the 300-296 waste site.

Work performed to date in support the 300-296 waste site remedial action has included 324 Building maintenance, partial structural stabilization of the B Cell foundation, installation of REAs in B Cell, cleanup of waste and debris within B Cell, and mockup facility construction and training. During the summer of 2023, preparatory activities were paused and discussions with EPA were initiated to revisit the remedial action approach in response to changed conditions.

Previous Public Participation

A Proposed Plan for the Hanford Site 300 Area was made available following release of the 2013 RI/FS report (DOE/RL-2010-99). A public comment period was held for the plan July 15 through August 16, 2013. Comments were received during the public comment period. A Responsiveness Summary was prepared providing responses to all comments and included in the 2013 ROD for the 300 Area (EPA et al., 2013).

As noted previously, RTD was selected generally for remediation of 300 Area waste sites, including the 300-296 waste site. Specific language was included in the 2013 ROD regarding use of the 324 Building to support remediation of the 300-296 waste site.

Previous Tribal Nations Participation

The Hanford Site is located on land ceded to the United States under separate treaties with the Confederated Tribes and Bands of the Yakama Nation and the Confederated Tribes of the Umatilla Indian Reservation. The Nez Perce Tribe also secured rights at what is now the Hanford Site in a separate treaty. DOE meets and consults with these Tribal Nations and the Wanapum Band of Indians, who were historical residents on Hanford Site lands.

SITE CHARACTERISTICS

Site Features, and Land and Groundwater Use

The 300 Area is a relatively flat area in the southeast portion of the Hanford Site that at one time was an operating industrial complex. Land use in the 300 Area complex is zoned “Industrial,” defined in the Comprehensive Land-Use Plan (DOE/EIS-0222-F, *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement*) as “An area suitable and desirable for activities, such as reactor operations, rail, barge transport facilities, mining, manufacturing, food processing, assembly, warehouse, and distribution operations. Includes related activities consistent with Industrial uses.” As noted in the 2013 ROD: “The 300-FF-l, 300-FF-2 and 300-FF-5 OU Areas are managed by the DOE and human access and use is restricted.” There is construction-type work in the area with deactivation and demolition of facilities, continued building maintenance activities, and Pacific Northwest National Laboratory operation of the 325 Laboratory.

Some of the groundwater in the 300-FF-5 OU is currently contaminated above standards as a result of historical operations and waste disposal practices in the 300 Area but unrelated to the 300-296 release. Withdrawal of this contaminated groundwater for uses other than remediation, research, and monitoring is prohibited by ***institutional controls*** currently in place.

The unsaturated zone (***vadose zone***) that is situated above the uppermost aquifer in the 300 Area is composed of localized backfill placed during building construction and the unconsolidated sands and gravels of the underlying Hanford geologic formation. The depth to groundwater is approximately 50 ft in the vicinity of the 324 Building. The thickness of the saturated portion of the aquifer along the Columbia River shoreline is about 80 ft. The changing river water stage directly influences local groundwater elevations.

Groundwater in the uppermost aquifer discharges to the Columbia River via upwelling through the riverbed and riverbank springs and seeps. The rate of discharge from the aquifer is very low, compared to the flow of the river. Groundwater flow direction in the immediate vicinity of the 324 Building is predominantly to the southeast.

Physical Features Influencing Remedy Selection

There are few physical features that directly influence remedy selection. The 300 Area complex was used for industrial activities, which were designed to provide appropriate building access. There are nearby building and facility remnants as well as demolition activities occurring onsite that create some physical limits for placement of temporary structures and constrain access points related to the 300-296 waste site remediation. Those constraints should be considered during detailed design but do not influence remedy selection.

Waste Site Contamination

The 300-296 waste site media consists of contaminated soil below the 324 Building resulting from the B Cell release that was discovered in 2009. Dose rates (in units of R/hr) can be safely measured from a distance and are an effective field indicator for the relative scale and location of contamination. For planning purposes, the

volume of contaminated soil to be removed beneath B Cell is estimated to be in the range of 24,000 ft^2. Attainment of cleanup objectives is assessed using activity measured in pCi/g (see the "Remedial Action Objectives" section of this Proposed Plan) and a site-specific verification process.

Limited characterization of the 300-296 waste site was performed from 2011 through 2015. The characterization activities provided initial estimates of the nature and extent of the contamination under the 324 Building. Waste containing cesium-137, strontium-90, and other radionuclides at comparatively lower levels leaked into the soil under B Cell. Radiation levels approaching 13,000 R/hr (for reference, levels above 0.2 R/hr require remote handling) were detected approximately 7 ft under the expansion joints in the B Cell floor.

While executing the structural stabilization design in 2022 and 2023 to prepare the 324 Building to support 300-296 excavation operations, soil contamination was measured beyond the planned remote excavation area, although it is still believed to have originated from the same source of release in B Cell. Forty-five boreholes were installed at various orientations into the vadose zone soil under B Cell. These boreholes and other investigation activities provided more than 2,200 measurements of dose rate (a good field indicator for contamination mapping), moisture, and temperature. Dose rates exceeding 1 R/hr were recorded for about 660 of the 2,200 total measurements and were recorded up to 20 ft below the bottom of the B Cell floor (or approximately 32 ft below ground surface). In addition, similar dose rates were observed laterally beyond the B Cell foundation, but still within the 324 Building footprint (Figure 2).

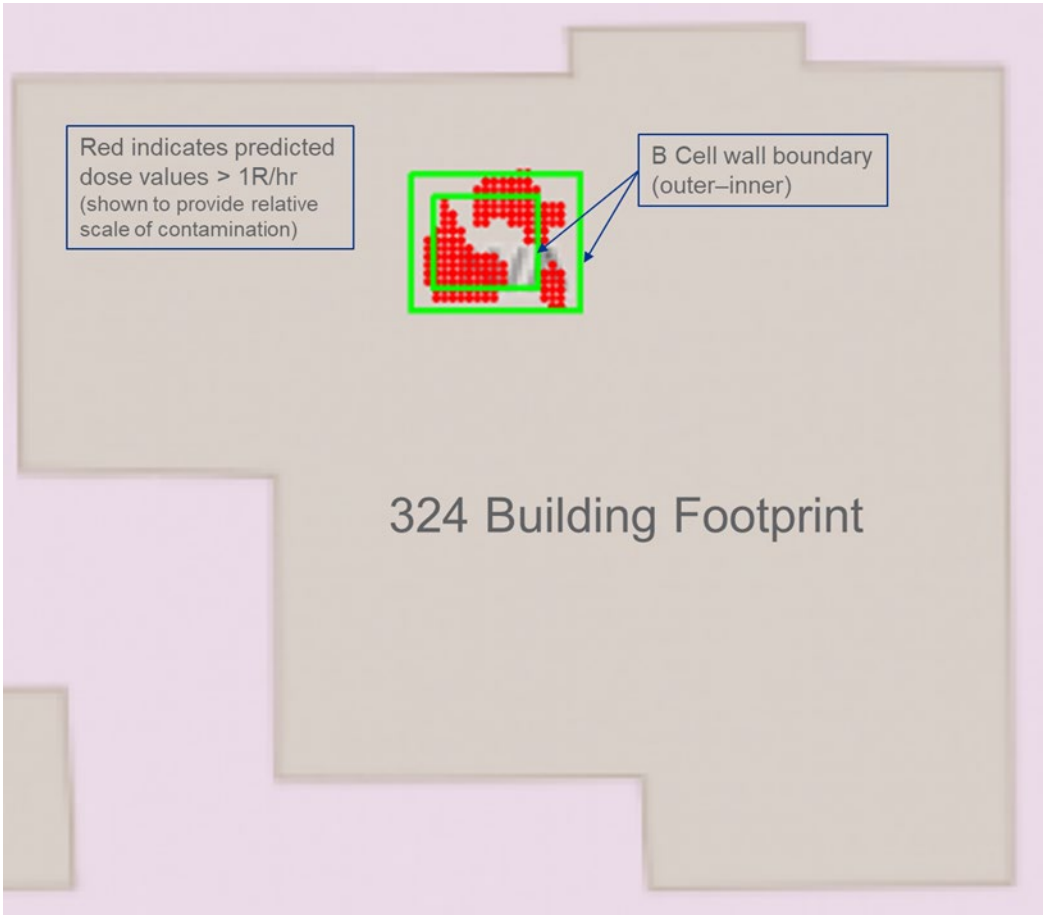

Figure 2. B Cell Location Within the 324 Building Footprint

Based on historic and more recent measurements, the soil contamination has significantly elevated (hundreds to thousands of R/hr) hot spots of localized contamination surrounded by areas of moderate contamination (less than 10 R/hr). Dose rates approaching 1,000 R/hr were measured over 10 ft below B Cell. These dose rates included locations beyond the reach of the REAs although still within the overall footprint of the 324 Building. Execution of the remote excavation design would leave significant contamination in the soil that may not meet

CERCLA protectiveness criteria and could not safely be addressed using conventional, open-air excavation methods after 324 Building demolition.

Groundwater Contamination

The potential groundwater impacts from ongoing 300 Area facility demolition and environmental cleanup activities are monitored as part of DOE/RL-2014-42, *300-FF-5 Operable Unit Remedy Implementation Sampling and Analysis Plan*. Figure 3 shows the locations of the groundwater monitoring wells in the sampling and analysis plan that are closest to the 324 Building. Sampling results, including results from the two wells immediately downgradient of the 324 Building (399-4-15 and 399-4-16), show no indication of impacts to groundwater from activities at the building or from the 300-296 waste site. This aligns with the conceptual site model that predicts strontium-90 and cesium-137 have low mobility in soil under ambient environmental conditions. The groundwater monitoring program continues to support conclusions that the contamination is stable and not migrating toward the river since the contamination is fully within the footprint of the 324 Building and ambient conditions do not provide a mobilization driver.

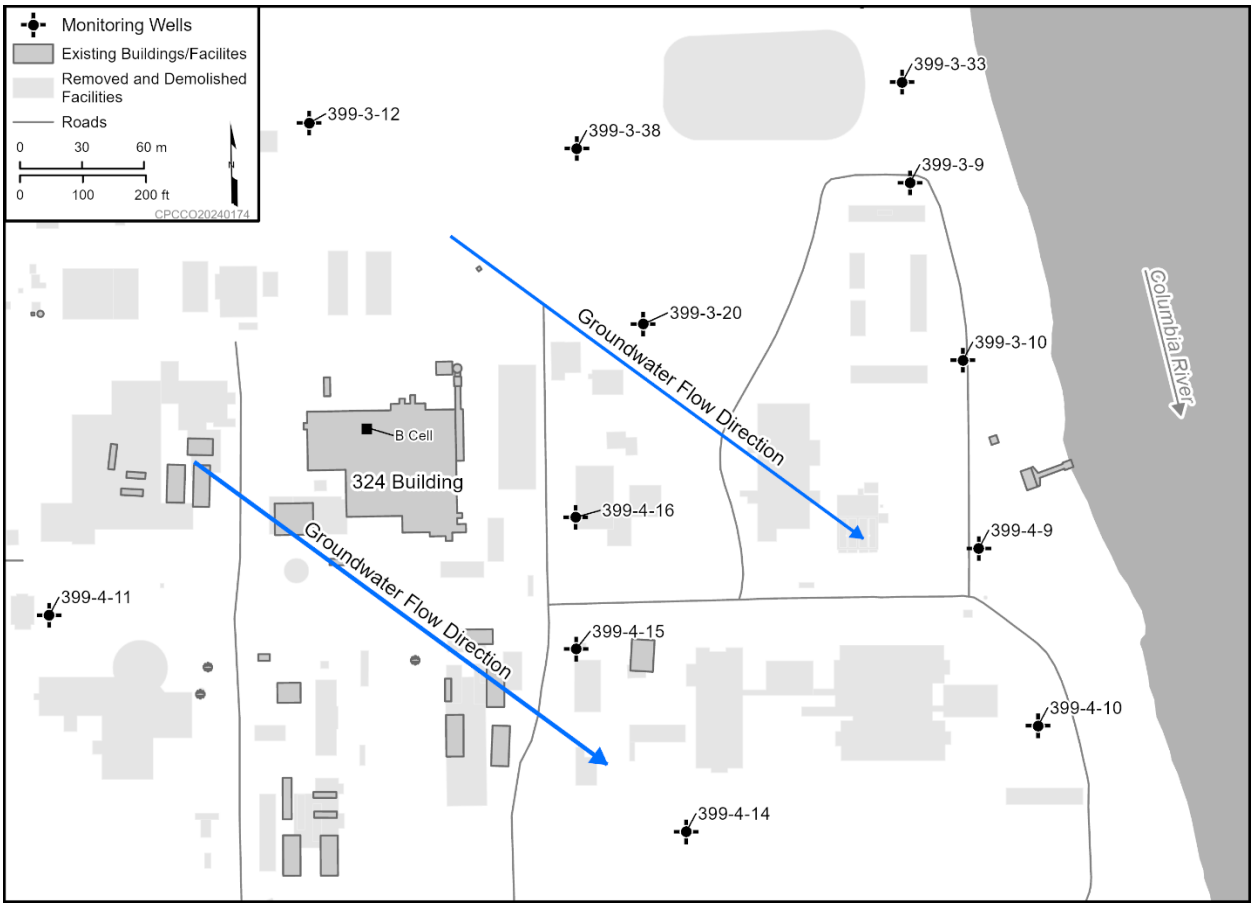

Figure 3. Locations of Groundwater Monitoring Wells in Proximity to the 324 Building

Principal Threat Waste

Principal threat wastes are those source materials present at concentrations considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur.

The 2013 ROD (EPA et al., 2013) noted that principal threat wastes existed in three waste sites in 300-FF-2, including the 300-296 waste site. The ROD includes the following description for soil from the 300-296 waste site.

> "Based on in-situ radiation measurements and sample data this soil is extremely radioactive. Direct exposure to the contaminated soil for just a fraction of a second would exceed the CERCLA $1x10^{-4}$ cancer risk limit. The Cesium-137 at 8 billion pCi/g and Strontium-90 at 400 million pCi/g are the primary isotopes causing the high radiation dose and risk. The high-risk soil requires remote excavation methods and is considered principal threat waste."

The ROD later expands on the previous reference.

> "Principal threat waste from the 300-296 waste site, vertical pipe units at 618-10 and 618-11 and caissons at 618-11 will be treated to the maximum extent practicable to reduce the toxicity, mobility, contamination or radiation exposure. Treatment may be in-situ or during excavation as needed to control worker exposure. Treatment will be with grout, or an alternative method approved by EPA during remedial design."

Strontium-90 and cesium-137 have low mobility in soil and the 300-296 waste site is currently protected by the overlying 324 Building structure. During the time period between completion of 324 Building demolition activities and the start or continuation of 300-296 excavation activities, measures will be taken to prevent contaminant mobilization (e.g., managing water infiltration in the vicinity of the waste site, applying fixatives or cover material to surface as needed).

SCOPE AND ROLE OF THE ACTION

This Proposed Plan is part of a cleanup strategy to complete remediation of the Hanford Site. The River Corridor and the Central Plateau are the two main geographic regions for cleanup work at the Hanford Site. The objective for the cleanup strategy is to ensure that cleanup actions address threats to human health and the environment in accordance with regulatory requirements.

The intent of the Hanford Site cleanup strategy is to shrink the waste management footprint to include just the Central Plateau for long-term waste management. The strategy includes remediation of waste sites and restoration of groundwater that (1) is protective of human health and the environment, including the Columbia River; (2) restores groundwater to beneficial use wherever practicable; and (3) supports reasonably anticipated future land uses.

This action specifically addresses cleanup of the soil contamination and principal threat waste associated with the 300-296 waste site. The two options considered to implement the cleanup action, which is based on RTD, are presented in this Proposed Plan along with identifying the approach preferred by both DOE and EPA.

SUMMARY OF SITE RISKS

Land and Groundwater Use Assumptions

Land Use

Land use in the River Corridor is currently controlled by DOE, with the U.S. Fish and Wildlife Service (USFWS) managing most of the Hanford Reach National Monument. DOE and the USFWS manage this federally owned land to protect natural and cultural resources while cleanup activities are being conducted.

This joint management also reflects the requirements of the USFWS management plan (USFWS, 2008, *Hanford Reach National Monument: Final Comprehensive Conservation Plan and Environmental Impact Statement; Adams, Benton, Grant and Franklin Counties, Washington*) for the Hanford Reach National Monument. Both DOE and the USFWS expect that this joint management of the Hanford Site will continue for many years into the future and that the property will remain under federal ownership.

As noted in the 2013 ROD (EPA et al., 2013), "The reasonably anticipated future land use for the 300 Area Industrial Complex and 618-11 is industrial. DOE's reasonably anticipated future land use for the remaining portions of the 300 Area will be industrial whereas EPA believes other uses including residential are the

reasonably anticipated future land use for the remaining areas where residential based cleanup levels are used, which also achieves a level of cleanup that allows for industrial use."

Groundwater Use

Under current site use conditions and controls, the only complete human exposure pathway to groundwater in 300-FF-5 is the potential for limited exposure to groundwater from intermittent seeps along the Columbia River or during remediation, research, and monitoring activities. 300-FF-5 (the groundwater OU) groundwater is not being used for drinking water. The 2013 ROD (EPA et al., 2013) considered other future beneficial uses of groundwater, including drinking water, irrigation, and industrial uses. However, the ROD also noted there were no plans to start using 300-FF-5 groundwater as drinking water when standards were met.

Risk Assessment

Key contaminants for the 300-296 waste site include cesium-137, strontium-90, and other radionuclides at comparatively lower levels that leaked into the soil under B Cell. The primary hazard from exposure to these contaminants is an increase in the risk of developing cancer.

The soil in the 300-296 waste site was identified in the 2013 ROD (EPA et al., 2013) as principal threat waste due to high radiation dose. Direct exposure to the contaminated soil for a fraction of a second would exceed the CERCLA $1x10^{-4}$ cancer risk limit.

A human health and ecological risk assessment was prepared and included in the 2013 RI/FS report (DOE/RL-2010-99). The risk assessment informed the 2013 ROD (EPA et al., 2013) and provided the basis for the selected RTD remedy and CULs that were established for the 300 Area waste sites. Accordingly, when the CULs are achieved through implemented remedial action, the as left conditions satisfy objectives for protection of humans and ecological receptors. Completion of excavation and remedial actions will be based on achieving the CULs and RAOs published in the 2013 ROD (EPA et al., 2013), accompanied by a CERCLA protectiveness determination. This conclusion will be demonstrated by site-specific verification sampling results and associated documentation to support backfill approval and site closeout by DOE and EPA.

REMEDIAL ACTION OBJECTIVES

RAOs from the 2013 ROD (EPA et al., 2013) are not being revisited and are presented in Table 1. These RAOs remain protective of human health and the environment. Likewise, the published CULs for soil and the institutional controls from the 2013 ROD that apply to the 300-296 waste site are unchanged (see the “Soil Cleanup Levels from 2013 Record of Decision” and “Institutional Controls from the 2013 Record of Decision” sections near the end of this Proposed Plan).

Table 1. RAOs from the 2013 ROD that Apply to the 300-296 Waste Site

RAO*	Description
RAO 2	Prevent contaminants of concern migrating and/or leaching through soil that will result in groundwater concentrations above CULs for protection of groundwater, and of surface water concentrations above CULs for the protection of surface water at locations where groundwater discharges to surface water.
RAO 4	Prevent human exposure to the upper 4.6 m (15 ft) of soil, structures, and debris contaminated with contaminants of concern at concentrations above CULs for industrial use in the 300 Area Industrial Complex and waste site 618-11 (adjacent to Energy Northwest).
RAO 5	Manage direct exposure to contaminated soils deeper than 4.6 m (15 ft) to prevent an unacceptable risk to human health and the environment.
RAO 6	Prevent ecological receptors from direct exposure to the upper 4.6 m (15 ft) of soil, structures, and debris contaminated with contaminants of concern at concentrations above CULs.

*RAOs 1, 3, and 7 from the 2013 ROD do not apply to the 300-296 waste site.

SUMMARY OF REMEDIAL ALTERNATIVES

As highlighted in the introduction, DOE and EPA agreed to retain RTD as a fundamental element for development of new remedial alternatives for the 300-296 waste site. Experience gained from the work performed to date at this site was used to identify options for modifying the previously selected RTD remedy to allow for safe and effective implementation. Previous remediation design options evaluated in 2011 (WCH-503, *Remediation Alternatives Evaluation for Contaminated Soil Beneath the 324 Building*) were also reviewed for potential applicability in context of the updated site conditions. A potential option of trying to excavate the entire 300-296 waste site through the B Cell floor prior to demolition of the 324 Building was considered but was eliminated prior to analysis due to technical impracticability.

Two remedial alternatives were retained and developed in the FFS report (DOE/RL-2024-33) as preliminary alternatives. EPA RI/FS guidance (OSWER Directive 9355.3-01, *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA*) suggests the preliminary remedial alternatives be reduced to less than 10 for final analysis. As the FFS was considering two preliminary alternatives, the two alternatives became the final alternatives for detailed analysis. The two remedial alternatives are summarized and compared with the 2013 remedy in Table 2.

Process options other than RTD were not considered in development of alternatives as they were part of the RI/FS process supporting the 2013 ROD (EPA et al., 2013) but reverted to RTD consistent with the bias for action approach and selection of RTD for waste sites throughout the River Corridor. In addition, a “No Action Alternative” was not considered in the FFS since the alternative had previously been considered in the 2013 ROD (EPA et al., 2013) and found to not meet the threshold criteria required for selection of a final remedial alternative. The RTD alternative met the threshold criteria and was ultimately selected for the 300 Area. Since the FFS focuses on specific means of applying an RTD remedy for the 300-296 waste site, consideration of a No Action Alternative in the FFS was not necessary.

The two remedial alternatives developed and evaluated in the FFS report (DOE/RL-2024-33) reach the same endpoint in implementing RTD at 300-296 to achieve the RAOs and CULs established in the 2013 ROD (EPA et al., 2013). The primary difference between the two remedial alternatives is that the first stage of 300-296 waste site excavation would be performed using the 324 Building and its equipment with the Coupled Alternative. The excavation would continue until the limits of the REAs had been reached. Following building demolition, the excavation would be completed under a temporary waste retrieval enclosure.

For the Decoupled Alternative, the 324 Building would not be used at all for 300-296 excavation and all excavation would be done under a temporary waste retrieval enclosure. A decoupled approach was not previously considered because it would have been inconsistent with the 2013 ROD (EPA et al., 2013).

Common Elements Between the Two Alternatives

The two remedial alternatives have many common elements that apply following demolition of the 324 Building. Common elements include constructing a temporary waste retrieval enclosure, excavating contaminated soil from the 300-296 waste site, and backfilling the excavation once CULs and RAOs have been achieved.

Temporary Waste Retrieval Enclosure

For both alternatives a new temporary waste retrieval enclosure would be designed and constructed to support remote retrieval operations. Temporary waste retrieval enclosures have been used to support remediation activities at the Hanford Site and as part of the Idaho Accelerated Retrieval Project at the Idaho National Laboratory site. The retrieval enclosures consist of steel-framed, tensioned membrane fabric structures designed in conformance with national nuclear quality assurance standards. Figure 4 provides a view of a similar temporary enclosure.

Table 2. Comparison of Key Elements of the Two Retained Alternatives

2013 Remedy	Coupled Alternative	Decoupled Alternative
Key Elements of the Alternatives – Pre-324 Building Demolition		
• Conducting operations and maintenance to keep the 324 Building viable for excavation of 300-296 waste through the hot cell floor • Completing structural stability modifications for B Cell (original design) to support excavating 300-296 waste through the hot cell floor • Excavating 300-296 waste through the hot cell floor to a depth of approximately 8-10 ft using the remote excavator arms as currently designed and installed • Packaging and placing the excavated 300-296 waste into adjacent 324 Building hot cells • Transporting and disposing of packaged 300-296 waste in ERDF • Filling the excavated area with material for shielding/stabilization until future remediation phase	• Conducting operations and maintenance to keep the 324 Building viable for excavation of 300-296 waste through the hot cell floor • Replacing B Cell and A/D cranes to support handling of waste material excavated from 300-296 • Redesigning and implementing structural stability modifications for B Cell to support excavating 300-296 waste through the hot cell floor • Excavating 300-296 waste through the hot cell floor to a depth of approximately 8-10 ft using the remote excavator arms as currently designed and installed • Packaging and placing the excavated 300-296 waste into adjacent 324 Building hot cells • Transporting and disposing of packaged 300-296 waste in ERDF • Filling the excavated area with material for shielding/stabilization until future remediation phase	Not applicable
Key Elements of the Alternatives – Post-324 Building Demolition		
• Excavating (open air) balance of fill material (from pre-demolition remote excavation), contaminated soil, debris, and below-ground structures as needed to achieve 300-296 RAOs and CULs • Packaging (open air), transporting, and disposing of excavated 300-296 waste in ERDF • Completing verification sampling and waste site reclassification • Backfilling the 300-296 excavation	• Designing and constructing a new temporary remote waste retrieval enclosure to support continued excavation of 300-296 waste • Excavating (remote, within enclosure) balance of fill material (from pre-demolition remote excavation), contaminated soil, debris, and below-ground structures as needed to achieve 300-296 RAOs and CULs • Packaging (remote, within enclosure), transporting, and disposing of 300-296 waste in ERDF • Demolishing and disposing of the remote retrieval enclosure • Completing verification sampling and waste site reclassification • Backfilling the 300-296 excavation	• Designing and constructing a new temporary remote waste retrieval enclosure to support excavation of 300-296 waste • Excavating (remote, within enclosure) contaminated soil, debris, and below-ground structures as needed to achieve 300-296 RAOs and CULs • Packaging (remote, within enclosure), transporting, and disposing of 300-296 waste in ERDF • Demolishing and disposing of the remote retrieval enclosure • Completing verification sampling and waste site reclassification • Backfilling the 300-296 excavation

Note: 2013 Remedy information provided for comparative purposes – cannot be implemented as originally envisioned.
ERDF: Environmental Restoration Disposal Facility

Figure 4. Example Temporary Remote Retrieval Enclosure

The retrieval enclosure envisioned to support the 300-296 remedial action would be sized to accommodate remote excavation operations, the excavation footprint (including layback), staging areas for equipment and materials, waste handling and packaging operations, maintenance activities, and support areas. The enclosure would also be capable of managing ingress/egress and controlling air movement. Figure 5 depicts a concept for the features and layout of a retrieval structure. Final specifications for the enclosure would be established post-ROD as part of the detailed remedy design.

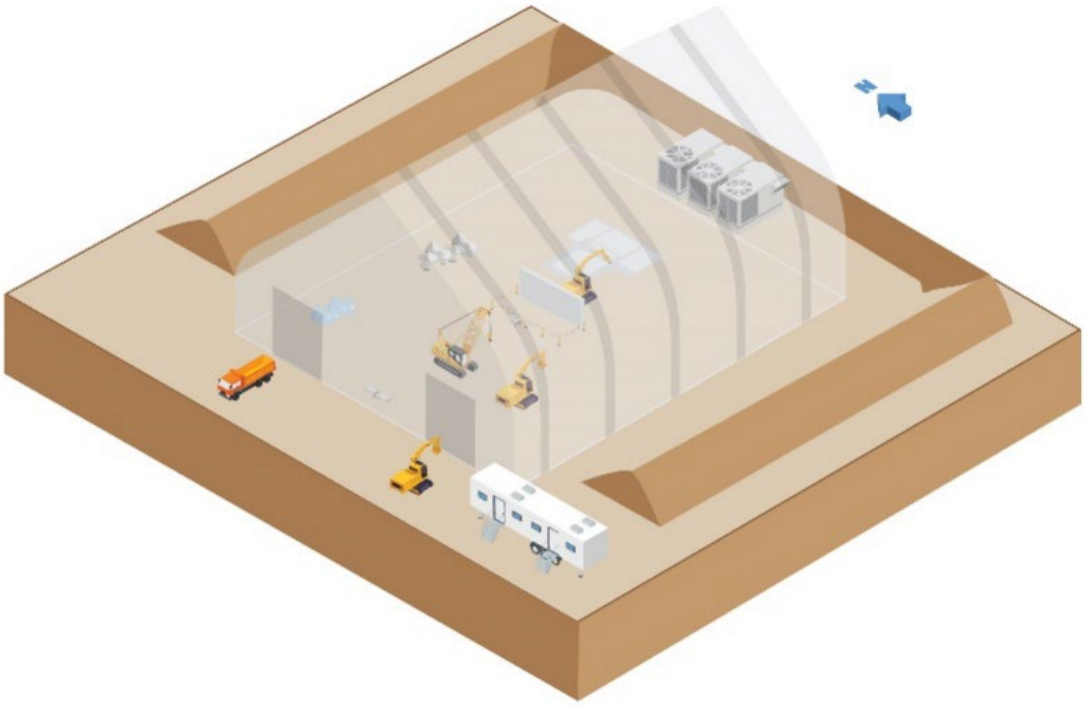

Figure 5. 300-296 Retrieval Structure Concept (Artistic Rendering Only)

Excavation

As selected in the 2013 ROD (EPA et al., 2013), RTD would be used to address the contaminated material associated with the 300-296 waste site and would consist of the following components:

- Contaminated soil and debris with concentrations above CULs would be removed, treated as necessary to meet disposal facility requirements, and sent to the ***Environmental Restoration Disposal Facility (ERDF)*** or another facility approved by EPA. Removal would include subsurface structures that are left following demolition of the 324 Building. The RTD alternative assumes an excavation depth sufficient to meet all RAOs, including protection of groundwater and the Columbia River and the prevention of direct exposure.
- Highly radioactive material would be excavated using remote equipment and isolated by mixing with grout or other suitable blending material to reduce the dose rate and to stabilize the waste material. This would address the requirements in the 2013 ROD for treatment of principal threat wastes in 300-296. Stabilized material would be removed to the extent necessary to ensure protection of human health and the environment and disposed of at ERDF or another facility approved by EPA.
- Excavation would employ best practices, which includes appropriately sloped excavation sidewalls based on the type of the material being removed, benching, shoring, and proper placement of stockpiled material per Occupational Safety and Health Administration standards.
- Monitoring of removed material would be performed during excavation (after removal of highly contaminated soil) to ensure that remediation is adequate to meet the CULs.

Verification Sampling and Backfilling

Verification sampling would be performed to demonstrate that contamination removal has been effective and the soil remaining in the excavated area would achieve the CULs and RAOs established in the 2013 ROD (EPA et al., 2013). Verification sampling would be conducted in accordance with a site-specific plan that considers the final excavation footprint and is approved by EPA. Specific elements of the verification sampling design would be established in the approved plan.

Once RAOs and CULs have been met and verified, the excavation would be approved for backfilling. Sources for backfill material may include local borrow pits. The backfilled site would be filled and contoured to match the surrounding grade and to minimize ponding of water over the remediated waste site.

Distinguishing Elements Between the Two Alternatives

The distinguishing element for the Coupled Alternative is use of the 324 Building and its hot cells to support partial excavation of the 300-296 waste site through the B Cell floor. This includes activities needed to maintain and prepare the 324 Building to enable its use that are otherwise not required for the Decoupled Alternative. Following demolition of the 324 Building, the common elements identified above would be implemented to complete the remedial action. Additional details for distinguishing elements of the Coupled Alternative are summarized in the following subsections.

324 Building Preparatory Activities for the Coupled Alternative

Preparatory activities would be required to make the 324 Building viable for use in partially excavating contaminated soil from the 300-296 waste site through the B Cell floor. These include the following:

- Cranes that service B Cell and A and D Cells would be replaced to support waste handling activities. Existing crane failures have occurred as the 324 Building continues to age and reliable cranes would be needed to safely execute the project.
- Additional measures to ensure structural stability of the 324 Building and B Cell would be designed and implemented. Challenges with implementation of the existing structural design were encountered and were summarized in Chapter 2 of the FFS (DOE/RL-2024-33). A supplemental structural stabilization design would be developed and implemented to make excavation through the B Cell floor possible without settling that could render critical equipment like the hot cells, airlocks, and service cranes unusable.
- General operation and maintenance activities would be continued to keep the 324 Building viable while other preparatory activities like the crane replacements and structural stability measures are implemented.

Reliance on use of the 324 Building to perform the Coupled Alternative involves inherent worker exposures to additional radiological and industrial hazards that must be accounted for in planning and execution for the maintenance activities and upgrades.

Soil RTD from Within B Cell for the Coupled Alternative

Prior to soil excavation, the B Cell floor would be segmented and removed using the remote equipment and the REAs. Soil would be excavated beneath B Cell to a depth of 8 to 10 ft and loaded into waste bins using the upper and lower REAs. The B Cell crane would be used to pick up the waste bin and transfer the waste bin between B Cell and the airlock. The B Cell crane would be used to place the waste bin on the airlock floor for dose measurement. The A/D crane would be used to move the higher dose level waste bins within the airlock or to either C Cell, D Cell, and/or A Cell, with the remaining bins placed into shielded waste packages.

Grout would be added to cover each layer of waste bins added to a cell and the cell eventually filled with grout to form monoliths. The cell monoliths along with the bins loaded into shielded waste packages would be separated from the 324 Building and transported to ERDF or other approved facility for disposal.

After remote soil excavation from beneath B Cell was completed, grout would be added to fill the excavation to the original floor elevation and enable future demolition of the 324 Building and remediation of the remaining contamination in the 300-296 waste site.

Remaining Soil RTD Post-Demolition – for the Coupled and Decoupled Alternatives

After demolition and removal of the 324 Building, the common elements identified previously would be implemented to complete the remedial action for the 300-296 waste site. The grout-filled void space from the pre-demolition excavation of highly contaminated soil through the B Cell floor would enable some efficiency with initial post-demolition excavation activities until the interface is reached between the grout material and remaining contaminated soil from the 300-296 waste site.

Estimated Duration and Cost for the Two Alternatives

Estimated Durations

The timeline for completion of activities and key elements of the estimated costs associated with the 300-296 waste site remediation for the Coupled Alternative is shown in Figure 6. Costs for disposition and demolition of the 324 Building are excluded from estimates for the Coupled Alternative as they will be addressed as part of the CERCLA removal actions in the 300 Area. However, the estimated duration of 324 Building demolition activities is considered when estimating the timeline to achieve the RAOs for the Coupled Alternative.

The time to achieve RAOs for the Coupled Alternative is estimated to be 12 years from the project start, assuming continuous work activities for the 300-296 remedial action and the 324 Building removal action.

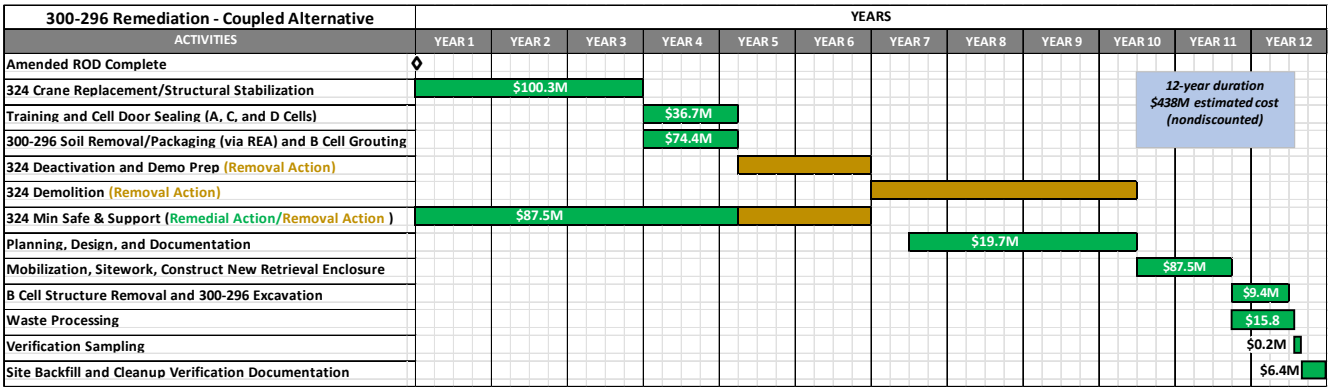

Figure 6. Timeline and Estimated Costs for Elements of the Coupled Alternative

The timeline for completion of activities and key elements of the estimated costs for the Decoupled Alternative is shown in Figure 7. The time to achieve RAOs for the Decoupled Alternative is estimated to be 8.5 years from the project start, again assuming continuous work activities for the 324 Building removal action and 300-296 remedial action.

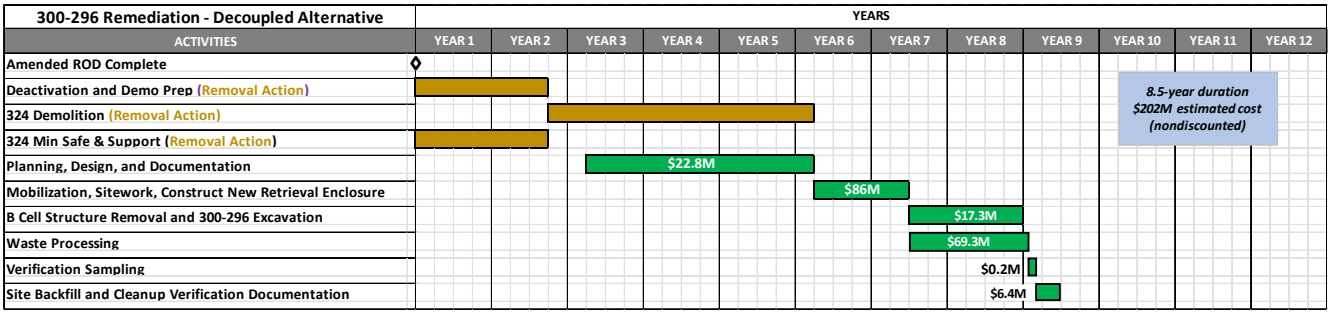

Figure 7. Timeline and Estimated Costs for Elements of the Decoupled Alternative

Comparing the two schedules, the Coupled Alternative that relies on using the 324 Building for the first portion of the excavation is estimated to take 3.5 years longer to achieve RAOs than the Decoupled Alternative. The primary difference in the schedules is the effort to upgrade the equipment within the 324 Building and extended time to perform management of excavated material within the cells in the building.

Estimated Costs

The 2013 ROD (EPA et al., 2013) included non-discounted and ***present value*** cost estimates for waste site remediation of $299 million and $248 million, respectively. These estimated costs included all of the 300-FF-2 waste sites that were part of the decision. Individual estimates for the 300-296 waste site were not provided.

Costs were estimated by DOE for the planned remedial actions at the 300-296 waste site, including components of remote excavation from within the 324 Building and open-air excavation following demolition of the 324 Building. The estimated cost as originally planned (before any updated understanding of site conditions and facility challenges) that DOE has been carrying in a lifecycle planning estimate (DOE/RL-2021-47, *2022 Hanford Lifecycle Scope, Schedule and Cost Report*) to complete remedial actions at the 300-296 waste site is approximately $87 million (2024 constant year dollars).

Estimated costs for the two alternatives presented in this Proposed Plan and the associated cost differences are shown in Table 3. The elements of the costs associated with various activities are embedded in the timelines above. The present value cost estimate represents the hypothetical amount needed to be set aside at the initial point in time (the base year) to ensure that funds would be available in the future given certain economic conditions specified in EPA's 2000 CERCLA Cost Guidance (OSWER Directive 9355.0-75, *A Guide to Developing and Documenting Cost Estimates During the Feasibility Study*). The present value estimate is calculated based on a predetermined interest rate, termed the discount rate, that is adjusted for the impact of inflation and the period over which the remedy will be completed. The guidance suggests the cost estimates presented in a feasibility study-level estimate are typical of those having a defined uncertainty range of -30% to +50%. The present value of the cost range is included in Table 3.

Table 3. Estimated Costs for the Two Alternatives

	Coupled Alternative	Decoupled Alternative	Cost Difference
Non-Discounted Estimate	$438 million	$202 million	$236 million
Present Value Estimate	$370 million	$164 million	$206 million
-30% - +50% Present Value	$259-$554 million	$115-$246 million	$144-$308 million

The non-discounted cost estimate is a simplified estimate specified by EPA's 2000 CERCLA Cost Guidance (OSWER Directive 9355.0-75) that represents the total amount in constant 2024 dollars necessary to implement the remedy assuming no escalation or inflation occurs over the life of the remedy.

These cost estimates are based on the best available information regarding the anticipated scope for the remedial action alternatives to meet the remedial action objectives and are documented in calculation files (ECE-24-300NPL00001, *Environmental Cost Estimates (ECE) for FFS for Remedial Action at the 300-296 Waste Site*; ECF-300NPL-24-0073, *Environmental Calculation File (ECF) for Cost Estimates for FFS for Remedial Action at the 300-296 Waste Site*). Changes in the cost elements may occur as a result of new information and data collected during the engineering design of the selected remedial alternative. These are order-of-magnitude cost estimates expected to be within -30% to +50% of the actual project costs, at an 80% confidence interval.

The Coupled Alternative is more expensive than the Decoupled Alternative because of the added costs associated with upgrading the building and equipment to support remediation and the incremental cost of maintaining the building while improvements are made, and excavation and soil management activities simultaneously occurring within the building.

EVALUATION OF ALTERNATIVES

Evaluation Criteria

When performing a feasibility study, the NCP [CFR 300.430(e)(9)(ii)] directs the use of nine criteria to evaluate the remedial alternatives individually and directs a comparative analysis of relative performance of each alternative against the nine criteria. Those criteria are specified in 40 CFR 300.430(f) and are grouped into three categories:

- "Threshold Criteria" are requirements that each alternative must meet in order to be eligible for selection as the preferred alternative.
- "Primary Balancing Criteria" are criteria used to illustrate differences or tradeoffs between alternatives.
- "Modifying Criteria" may be considered to the extent that information is available during the FS but can be fully considered after feedback from the state and following review of public and Tribal Nation comments on the Proposed Plan.

These criteria are further described in Table 4.

Table 4. Description of the Nine Criteria Used for Remedy Analysis

Criteria	Description
Threshold Criteria	
Overall Protection of Human Health and the Environment	Addresses whether or not a remedy provides adequate protection and describes how risks posed through each pathway are eliminated, reduced, or controlled.
Compliance with ARARs	Addresses whether or not a remedy will meet cleanup levels or criteria found in appropriate federal and state environmental requirements or provide justification for a waiver.
Primary Balancing Criteria	
Long-Term Effectiveness and Permanence	Refers to the ability of a remedy to provide reliable protection of human health and the environment over time.
Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment	Refers to the preference for a remedy that reduces health hazards, the movement of contaminants, or the quantity of contaminants at the site through treatment.
Short-Term Effectiveness	Addresses the period of time needed to complete the remedy and any adverse effects to human health and the environment that may be caused during the construction and implementation of the remedy.
Implementability	Refers to the technical and administrative feasibility of the remedy, including the availability of materials and services needed to carry out the remedy and coordination of federal, state, and local governments to work together to clean up the site.
Cost	Evaluates the estimated capital, periodic, and operation and maintenance costs of each alternative in comparison to other, equally protective measures.
Modifying Criteria	
State Acceptance	Indicates whether the State of Washington accepts or rejects the preferred alternative.
Community Acceptance	Reflects feedback from review of all alternatives presented and indicates whether the public and Tribal Nations accept or reject the preferred alternative.

Preliminary Evaluation of Nine Criteria Factors

This Proposed Plan is somewhat unique in that the two alternatives being evaluated and compared are both RTD alternatives and vary primarily based on use of the 324 Building to support the partial excavation. Both alternatives achieve the same RAOs and meet the same CULs established in the 2013 ROD (EPA et al., 2013). The endpoints for remediation are identical and do not change based on the alternative.

Since many elements are identical and consistent with the original 2013 ROD, the individual analysis of each alternative against the nine criteria specified in the NCP was tailored and focused to specific items relevant to the situation. The comparative analysis of each alternative against the nine criteria considered all nine criteria.

Comparison of Alternatives Against the Nine Criteria

Alternatives were evaluated individually against the relevant criteria where alternatives could be differentiated. The full comparison of the two alternatives for each criterion is summarized in Table 5.

Table 5. Summary of the Analysis of Alternatives Against the Nine Criteria

Criteria	Coupled Alternative: Limited RTD of 300-296 Through B Cell Floor	Decoupled Alternative: RTD of 300-296 Following Demolition of 324 Building	Comparison/Conclusion
Threshold Criteria			
Overall Protection of Human Health and the Environment	Meets the RAOs for protection of human health and the environment.	Meets the RAOs for protection of human health and the environment.	No difference. The alternatives would provide equal overall protection.
Compliance with ARARs	Satisfies the ARARs established for site.	Satisfies the ARARs established for the site.	No difference. Both alternatives expected to be fully compliant with ARARs. No ARAR waiver would be needed.
Primary Balancing Criteria			
Long-Term Effectiveness and Permanence	Provides long-term effectiveness and permanence by removing contaminated soil and debris and disposing in ERDF or other approved disposal facility.	Provides long-term effectiveness and permanence by removing contaminated soil and debris and disposing in ERDF or other approved disposal facility.	Equally effective and permanent long-term.
Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment	Reduces mobility of contaminants through removal and placement into engineered disposal cells at ERDF or other approved disposal facility.	Reduces mobility of contaminants through removal and placement into engineered disposal cells at ERDF or other approved disposal facility.	Equivalent reduction of toxicity, mobility, or volume of contaminants through treatment.
Short-Term Effectiveness	Work would be performed in a manner that is protective of the public, workers, and environment. The time to achieve RAOs would be approximately 12 years.	Work would be performed in a manner that is protective of the public, workers, and environment. The time to achieve RAOs would be approximately 8.5 years.	Equally protective of human health and the environment. The time to achieve RAOs would be approximately 3.5 years shorter for the Decoupled Alternative.

Table 5. Summary of the Analysis of Alternatives Against the Nine Criteria

Criteria	Coupled Alternative: Limited RTD of 300-296 Through B Cell Floor	Decoupled Alternative: RTD of 300-296 Following Demolition of 324 Building	Comparison/Conclusion
Implementability	Remediation of 300-296 performed in two phases, pre- and post-demolition. Work includes steps necessary to upgrade the 324 Building and its equipment to enable excavation from within B Cell. Reliance on use of the 324 Building to perform the Coupled Alternative involves inherent worker exposures to additional radiological and industrial hazards that must be accounted for in planning and execution for the maintenance activities and upgrades.	Remediation of 300-296 performed in single phase, post-demolition. 324 Building maintenance and upgrades are unnecessary to support implementation.	The Decoupled Alternative is simplified and more implementable due to the absence of extra steps necessary to upgrade the 324 Building and its equipment to enable excavation from within B Cell. Reliance on use of the 324 Building to perform the Coupled Alternative involves inherent worker exposures to additional radiological and industrial hazards that must be accounted for in planning and execution for the maintenance activities and upgrades.
Cost	Non-discounted: ~$438M Present Value: ~$370M	Non-discounted: ~$202M Present Value: ~$164M	The Decoupled Alternative is more cost effective, primarily due to avoided costs associated with building maintenance and upgrades for the Coupled Alternative.
Modifying Criteria			
State Acceptance	Presumably supportive as RTD continues to be used as was selected in the 2013 ROD.	Presumably supportive as RTD continues to be used as was selected in the 2013 ROD.	Will be finalized following the public comment period.
Community Acceptance	Will be determined during the public comment process for the Proposed Plan.	Will be determined during the public comment process for the Proposed Plan.	Will be finalized following the public comment period.

The Decoupled Alternative is preferred and will achieve the RAOs for cleanup of the 300-296 waste site. The two alternatives were evaluated against the nine criteria specified in the NCP. Both alternatives met the threshold criteria. After considering the alternatives based on the balancing criteria, the Decoupled Alternative was rated better for short-term effectiveness, implementability, and cost. Estimated duration and cost to achieve the cleanup objectives is 3.5 years (29%) and $236 million (non-discounted) (46%) less, respectively, for the Decoupled Alternative when compared with the Coupled Alternative. Reliance on use of the 324 Building to perform the Coupled Alternative involves inherent worker exposures to additional radiological and industrial hazards that must be accounted for in planning and execution for maintenance activities and upgrades that are not needed under the Decoupled Alternative. Further input from the state, public, and Tribal Nations is needed to determine the comparison of the two alternatives against the modifying criteria, which will be provided as part of the review process for this Proposed Plan.

COMMUNITY PARTICIPATION

The Administrative Record for this proposed remedial action decision is available for review at http://pdw.hanford.gov/. This Proposed Plan and the *Focused Feasibility Study for Remedial Action at the 300-296 Waste Site* (DOE/RL-2024-33) are available at the repositories listed to the right.

The comment period for this Proposed Plan extends from June 9 through July 9, 2025. Comments on the alternatives, supporting information, or any element of this Proposed Plan will be accepted through July 9, 2025. Please send comments to the following:

Email (preferred): 324_ProposedPlan@rl.gov

Mail: Dana Gribble
U.S. Department of Energy
P.O. Box 450, H5-20
Richland, WA 99352

Hybrid Public Meeting

A hybrid public meeting will be held June 30, at 5:30 p.m. PT, at the Richland Public Library, 955 Northgate Drive, Richland, WA 99352. It will include a presentation on the Proposed Plan along with a question-and-answer session. During the hybrid meeting, you can view the presentation, hear the speakers, and ask questions. To participate via Microsoft Teams, please follow the instructions below:

Join on your computer or Teams mobile app

bit.ly/4kQGgfQ

Or call in (audio only)

(509) 931-1284 United States
(833) 633-0875 United States (Toll-free)
Phone Conference ID: 156 530 249#

After the public comment period, DOE and EPA will consider the comments received regarding this Proposed Plan and the information gathered during the comment period.

Hanford Public Information Repository

Administrative Record Contact Information

Phone: (509) 376-2530
Email: adminrec@rl.gov
Website: http://pdw.hanford.gov/arpir/

Portland
Portland State University
Branford P. Millar Library
1875 SW Park Avenue
Portland, OR 97207-1151
Phone: (503) 725-4542
Location information:
https://library.pdx.edu/about/directions/

Seattle
University of Washington
Suzzallo Library
Government Publications Department
P.O. Box 352900
Seattle, WA 98195-2900
Phone: (206) 543-5597
Location information:
https://www.lib.washington.edu/services/borrow/returns

Richland
Washington State University, Tri-Cities
Consolidated Information Center
Room 101-L, 2770 University Drive
Richland, WA 99352
Phone: (509) 375-3308
Location Information: http://readingroom.labworks.org/Directions.aspx

Spokane
Gonzaga University
Foley Center Library
East 502 Boone Avenue
Spokane, WA 99258
Phone: (509) 313-6110
Location Information:
https://www.gonzaga.edu/academics/libraries

SOIL CLEANUP LEVELS FROM 2013 RECORD OF DECISION

Table 6 presents the soil cleanup levels from the 2013 ROD (EPA et al., 2013) that apply for waste sites within the 300 Area industrial complex, which includes the 300-296 waste site. The table extracts the complete listing of potential contaminants from the ROD and is not intended to represent contaminants of concern specific to the 300-296 waste site.

Table 6. Complete List of 2013 ROD Soil Cleanup Levels for the 300 Area Industrial Complex

Contaminant	Units	Shallow Zone <= 15 ft bgs Direct Exposure Human Health		Surface to Groundwater – Groundwater and River Protection
		CUL	Basis	
Americium-241	pCi/g	210	RA	--
Cesium-137	pCi/g	18	RA	--
Cobalt-60	pCi/g	5.2	RA	--
Europium-152	pCi/g	12	RA	--
Europium-154	pCi/g	11	RA	--
Europium-155	pCi/g	518	RA	--
Iodine-129	pCi/g	1,940	RA	37.1
Plutonium-238	pCi/g	155	RA	--
Plutonium-239/240	pCi/g	245	RA	--
Plutonium-241	pCi/g	12,900	RA	--
Technetium-99	pCi/g	166,000	RA	420
Strontium-90	pCi/g	1,970	RA	--
Tritium	pCi/g	1,980	RA	12,200
Uranium-233/234	pCi/g	167	RA	--
Uranium-235	pCi/g	16	RA	--
Uranium-238	pCi/g	167	RA	--
Uranium isotopes total	pCi/g	350	RA	--
Antimony	mg/kg	1,400	MTCA-C	760
Arsenic	mg/kg	20	MTCA-C	--
Barium	mg/kg	700,000	MTCA-C	--
Beryllium	mg/kg	7,000	MTCA-C	--
Cadmium	mg/kg	3,500	MTCA-C	--
Chromium (total)	mg/kg	>1,000,000	MTCA-C	--
Chromium (VI)	mg/kg	10,500	CWA	2.0
Cobalt	mg/kg	1,050	MTCA-C	--
Copper	mg/kg	140,000	MTCA-C	--
Lead	mg/kg	1,000	MTCA-C	--
Lithium	mg/kg	7,000	MTCA-C	--
Manganese	mg/kg	490,000	MTCA-C	--
Mercury	mg/kg	1,050	MTCA-C	--
Nickel	mg/kg	70,000	MTCA-C	--
Selenium	mg/kg	17,500	MTCA-C	912
Silver	mg/kg	17,500	MTCA-C	--
Strontium	mg/kg	>1,000,000	MTCA-C	--
Tin	mg/kg	>1,000,000	MTCA-C	--
Uranium	mg/kg	505	MTCA-C	157
Vanadium	mg/kg	17,500	MTCA-C	--
Zinc	mg/kg	>1,000,000	MTCA-C	--
Cyanide	mg/kg	42	MTCA-C	1,960
Fluoride	mg/kg	210,000	MTCA-C	--
Nitrate	mg/kg	>1,000,000	MTCA-C	21,000
Aroclor 1016	mg/kg	245	MTCA-C	--

Table 6. Complete List of 2013 ROD Soil Cleanup Levels for the 300 Area Industrial Complex

Contaminant	Units	Shallow Zone <= 15 ft bgs Direct Exposure Human Health		Surface to Groundwater – Groundwater and River Protection
		CUL	Basis	
Aroclor 1221	mg/kg	66	MTCA-C	0.026
Aroclor 1232	mg/kg	66	MTCA-C	0.026
Aroclor 1242	mg/kg	66	MTCA-C	--
Aroclor 1248	mg/kg	66	MTCA-C	--
Aroclor 1254	mg/kg	66	MTCA-C	--
Aroclor 1260	mg/kg	66	MTCA-C	--
Cis-1,2-Dichloroethylene (DCE)	mg/kg	7,000	MTCA-C	18
Carbon tetrachloride	mg/kg	6.1	MTCA-C	0.86
Chloroform	mg/kg	2.4	MTCA-C	2.1
1,1,1-Trichloroethane	mg/kg	8,000	MTCA-C	686
1,2-Dichloroethene (total)	mg/kg	31,500	MTCA-C	89
Methyl ethyl ketone (2-Butanone)	mg/kg	62,200	MTCA-C	2,590
Methylisobutylketone-(hexone) (4-Methyl-2-pentanone)	mg/kg	28,700	MTCA-C	445
Benzene	mg/kg	5.7	MTCA-C	1.4
Ethyl acetate	mg/kg	>1,000,000	MTCA-C	--
Ethylene glycol	mg/kg	>1,000,000	MTCA-C	7,770
Hexachlorobutadiene	mg/kg	1,680	MTCA-C	--
Hexachloroethane	mg/kg	25	MTCA-C	72
Tetrachloroethene	mg/kg	82	MTCA-C	6.0
Toluene	mg/kg	10,400	MTCA-C	2,190
Vinyl chloride	mg/kg	5.2	MTCA-C	0.021
Xylenes (total)	mg/kg	227	MTCA-C	11,090
Benzo(a)pyrene	mg/kg	18	MTCA-C	--
Chrysene	mg/kg	1,800	MTCA-C	--
Tributyl phosphate	mg/kg	14,600	MTCA-C	658
Trichloroethene (TCE)	mg/kg	3.5	MTCA-C	2.4
Normal paraffin hydrocarbon (kerosene)	mg/kg	2,000	MTCA-C	2,000
Total petroleum hydrocarbons – diesel	mg/kg	2,000	MTCA-C	2,000
Total petroleum hydrocarbons – motor oil	mg/kg	2,000	MTCA-C	2,000

Notes: CUL basis for radionuclides is a cancer risk of $1x10^{-4}$ or 15 mrem/yr dose, whichever is more conservative. For uranium, 15 mrem/yr is more conservative, so that is the basis for the uranium isotope total CUL. That total is divided among the individual uranium isotopes using the natural ratio of isotopes.

No uranium isotope cleanup level is selected for groundwater and river protection because the drinking water standard is used, which is based on uranium metal.

CUL basis for chemicals is the more conservative of a hazard index of one or the cancer risk. The cancer risk is $1x10^{-5}$ for industrial cleanup based on MTCA.

Basis for soil CUL for groundwater and river protection is the soil leach model in the remedial investigation.

bgs: below ground surface

CWA: Clean Water Act

RA: risk assessment

MTCA: Washington State's Model Toxics Control Act Cleanup Regulations (WAC 173-340). MTCA-C is industrial.

INSTITUTIONAL CONTROLS FROM 2013 RECORD OF DECISION

This section presents the institutional controls (ICs) from the 2013 ROD (EPA et al., 2013), including common elements and those that apply specifically for 300-FF-2 waste sites. Final ICs for the 300-296 waste site will be determined post-remediation based on the as-left conditions.

Institutional Controls Common Elements for 300-FF-2 and 300-FF-5

The following text is extracted and presented as unmodified from Section 12.2.3 of the 2013 ROD (EPA et al., 2013).

> ICs are required before, during and after the active phase of remedial action implementation where ICs are needed to protect human health and the environment. ICs are used to control access to residual contamination in soil and groundwater above standards for unlimited use and unrestricted exposure. DOE shall be responsible for implementing, maintaining, reporting on and enforcing ICs. Although the DOE may later transfer these procedural responsibilities to another party by contract, property transfer agreement or through other means, the DOE shall retain ultimate responsibility for remedy integrity and ICs. In the event that land is transferred out of federal ownership, deed restrictions (proprietary controls such as easements and covenants) are required that are legally enforceable against subsequent property owners.
>
> The current implementation, maintenance and periodic inspection requirements for ICs at the Hanford Site are described in approved work plans and in the Sitewide Institutional Controls Plan (DOE/RL-2001-41) that was prepared by DOE and approved by EPA and the State in 2002. No later than 180 days after the ROD is signed, DOE shall update the Sitewide Institutional Controls Plan to include the ICs required by this ROD and specify the implementation and maintenance actions that will be taken, including periodic inspections. The revised Sitewide Institutional Controls Plan shall be submitted to EPA and the Washington State Department of Ecology (Ecology) for review and approval as a Tri-Party Agreement primary document. The DOE shall comply with the Sitewide Institutional Controls Plan as updated and approved by EPA and Ecology.
>
> The following institutional control performance objectives are required to be met as part of this remedial action. Land-use controls will be maintained until CULs are achieved and the concentrations of hazardous substances are at such levels to allow for unlimited use and unrestricted exposure and EPA authorizes the removal of restrictions. ICs to be implemented by DOE to support achievement of the RAOs include the following:
>
> - In the event that land is transferred out of federal ownership, deed restrictions (proprietary controls such as easements and covenants) are required that are legally enforceable against subsequent property owners.
> - In the event of any unauthorized access (e.g. trespassing), DOE shall report such incidents to the Benton County Sheriff's Office for investigation and evaluation of possible prosecution.
> - Activities that would disrupt or lessen the performance of any component of the remedies are prohibited.
> - The DOE shall report on the effectiveness of ICs for 300-FF-2 and 300-FF-5 in an annual report, or on an alternative reporting frequency specified by the lead regulatory agency. Such reporting may be for 300-FF-2 and 300-FF-5 alone or may be part of the Hanford Sitewide ICs report.
>
> Measures that are necessary to ensure continuation of ICs shall be taken before any lease or transfer of any land subject to ICs. DOE will provide notice to Ecology and EPA at least 6 months before any transfer or sale of land subject to ICs so that the lead regulatory agency can be involved in discussions to ensure that appropriate provisions are included in the transfer terms or conveyance documents to maintain effective ICs. If it is not possible for DOE to notify

Ecology and EPA at least 6 months before any transfer or sale, DOE will notify Ecology and EPA as soon as possible, but no later than 60 days before the transfer or sale of any property subject to ICs. In addition to the land transfer notice and discussion provisions, DOE further agrees to provide Ecology and EPA with similar notice, within the same time frames, as to federal-to-federal transfer of property. DOE shall provide a copy of the executed deed or transfer assembly to Ecology and EPA. DOE shall notify EPA and Ecology immediately upon discovery of any activity inconsistent with the specific ICs.

Institutional Controls Unique Elements for 300-FF-2

The following text is extracted and presented as unmodified from Section 12.2.4 of the 2013 ROD (EPA et al., 2013).

The following institutional control performance objectives are required to be met as part of this remedial action for 300-FF-2. Land-use controls will be maintained until CULs are achieved and the concentrations of hazardous substances are at such levels to allow for unlimited use and unrestricted exposure and EPA authorizes the removal of restrictions. ICs to be implemented by DOE to support achievement of the RAOs include the following:

- Exposure to contamination deeper than 4.6 m (15 ft) bgs is not anticipated. Where contamination at depth exceeds the residential or industrial use CULs, ICs are required to ensure future activities do not bring this contamination to the surface or otherwise result in exposure to contaminant concentrations that exceed the CULs.
- The DOE will prevent the development and use of property that does not meet residential CULs at the 300 Area Industrial Complex and 618-11 for other than industrial uses, including use of property for residential housing, elementary and secondary schools, childcare facilities and playgrounds.
- Signage and access control to waste sites with contamination above CULs will be provided.
- DOE shall employ and maintain an excavation permit program for protection of human health against unacceptable exposure, and protection of environmental and cultural resources.
- Prevent enhanced recharge in the 300 Area Industrial Complex and 618-11 over or near waste sites with soil concentration at any depth that exceed residential (irrigation-based) groundwater and surface water protection CULs until the CULs are achieved. Enhanced recharge controls are no irrigation or landscape watering, control drainage from low permeability areas including paved parking lots or buildings, and prevent bare gravel or bare sand covers.

ACRONYM LIST

ARAR	applicable or relevant and appropriate requirement
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	*Code of Federal Regulations*
CUL	cleanup level
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
FFS	focused feasibility study
FS	feasibility study
NCP	National Contingency Plan (“National Oil and Hazardous Substances Pollution Contingency Plan” [40 CFR 300])
OU	operable unit
RAO	remedial action objective
REA	remote excavation arm
RI	remedial investigation
ROD	Record of Decision
RTD	removal, treatment as necessary, and disposal
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
USFWS	U.S. Fish and Wildlife Service

GLOSSARY

Administrative Record: Collection of information (including reports, public comments, and correspondence) that contains the documents that form the basis for selection of a response action. A list of locations where the Administrative Record is available appears in the "Community Participation" section of this Proposed Plan.

Applicable or relevant and appropriate requirements (ARARs): "Applicable requirements" mean those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance found at a CERCLA site. Only those state standards that are identified by a state in a timely manner and that are more stringent than federal requirements may be applicable. "Relevant and appropriate requirements" mean those cleanup standards, standards of control, and other substantive requirements, criteria, or limitations promulgated under federal environmental or state environmental or facility siting laws that, while not "applicable" to a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site, address problems or situations sufficiently similar to those encountered at the CERCLA site that their use is well suited to the particular site. Only those state standards that are identified in a timely manner and are more stringent than federal requirements may be relevant and appropriate.

Baseline risk assessment: A study to characterize the current and potential threats to human health and the environment if no remedial action is taken at the site. It is also used to help establish acceptable exposure levels for use in developing remedial alternatives and to determine the need, or basis, for action.

Cleanup levels (CULs): A concentration that must be met at a specified location within the media of concern. It also includes any additional regulatory requirements that may be specified in applicable state or federal laws.

***Code of Federal Regulations* (CFR):** The codification of the general and permanent rules published in the *Federal Register* by the executive departments and agencies of the federal government. It is divided into 50 titles that represent broad areas subject to federal regulation. Each volume of the CFR is updated once each calendar year.

***Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA):** Also known as the Superfund Act, CERCLA is the federal law that establishes a program to identify, evaluate, and remediate sites where hazardous substances, pollutants, or contaminants have been released (e.g., leaked, spilled, or dumped) to the environment or where there is a substantial threat of such a release.

Contaminant of concern: Radionuclides and chemicals that exceed risk threshold values and are addressed by cleanup actions at the site.

Environmental Restoration Disposal Facility (ERDF): The Hanford Site onsite CERCLA-approved facility for the disposal of hazardous (radioactive and nonradioactive) waste and contaminated environmental media in accordance with CERCLA response action decision documents and ERDF waste acceptance criteria.

Groundwater: Water in a saturated zone or geologic stratum beneath the land surface or beneath a surface water body.

Hot cell: Controlled areas built within the 324 Building to allow Hanford Site personnel to work with highly radioactive materials without being exposed to radiation. Workers stood outside the hot cells and observed through leaded-glass windows as they conducted activities with remotely operated equipment.

Institutional control: Nonengineered instruments, such as administrative and legal controls, that help to minimize the potential for exposure to contamination and/or to protect the integrity of a response action.

"National Oil and Hazardous Substances Pollution Contingency Plan" (NCP): The NCP (40 CFR 300) provides the organizational structure and procedures for preparing for and responding to discharges of oil and releases of hazardous substances, pollutants, and contaminants.

No action: Sites that can be released for unrestricted land use because they pose no unacceptable risk to human health and the environment. A no action alternative is required to be considered under CERCLA in making a remedial action selection.

Operable unit (OU): A discrete portion of the Hanford Site, as identified in Section 3.3 of the *Hanford Federal Facility Agreement and Consent Order Action Plan* (Ecology et al., 1989). An OU at the Hanford Site is a group of land disposal sites and/or contaminated groundwater grouped together for the purposes of performing an RI/FS and subsequent cleanup actions. The primary criteria for placement of a site into an OU include geographic proximity, similarity of waste characteristics and site type, and the possibility for economies of scale.

Preferred alternative: The remedial action proposed after an evaluation of a range of viable alternatives. The preferred alternative must be protective of human health and the environment.

Present value: The amount needed to be set aside in the base year (2024) to ensure funds will be available in the future as they are needed, assuming certain economic conditions such as the "discount rate," which is similar to an interest rate.

Principal threat waste: Source material considered to be highly toxic or highly mobile that generally cannot be reliably contained or would present a significant risk to human health or the environment should exposure occur.

Proposed Plan: A document that briefly describes the remedial alternatives analyzed, proposes a preferred remedial action alternative, and summarizes the information relied upon to select the preferred alternative. The Proposed Plan provides the public with an opportunity to comment on the preferred alternative, as well as the other alternatives under consideration.

Radionuclide: An unstable atom that emits excess energy (decays) in the form of radioactivity (rays or particles). Depending on the type and amount of decay, exposure may be harmful.

Record of Decision (ROD): The CERCLA document used to select the method of remedial action to be implemented at a site after the Feasibility Study/Proposed Plan process has been completed.

Remedial action objective (RAO): A remedial action objective specifies contaminants and media of concern, potential exposure pathways, and remediation goals.

Remedial alternative: An action performed to reduce potential harm to human health and the environment from radioactive or hazardous substances. A remedial alternative includes all elements required to fully complete an action at a site.

Remedial investigation/feasibility study (RI/FS): The RI is a process to determine the nature and extent of the problem presented by releases or threats of releases of hazardous substances, and it includes the gathering of sufficient information to determine the necessity for remedial action and to support evaluation of remedial alternatives. The FS develops and evaluates options for remedial action.

Remote excavation arms (REAs): Mechanical devices that would be installed within a cell and controlled behind protective barriers that allow an operator to perform necessary work such as excavation or moving of containers.

Removal, treatment (as required), and disposal (RTD): A cleanup method where soil and debris are excavated in such a way that no contaminants above the approved remedial action levels or concentration remain. Excavated material is treated (if required for disposal) and sent to an onsite or offsite engineered facility for disposal.

Responsiveness Summary: The Responsiveness Summary is made available with the ROD and contains the significant public comments received on the Proposed Plan and responses.

ROD Amendment: A document required when a fundamental change is to be made to the basic features of the remedy selected in a ROD with respect to scope, performance, or cost. The change is to be developed and documented consistent with the ROD process, including issuance of a revised Proposed Plan that highlights the proposed changes.

Temporary waste retrieval enclosure: A structure used for remediation at the Hanford Site and as part of the Idaho Accelerated Retrieval Project at the Idaho National Laboratory site. Temporary structures with appropriate air flow and filtration and other controls are erected and remote methods are used for excavation. Material is placed in appropriate storage containers that are then sealed and transported to storage/disposal.

Tri-Party Agencies: Three agencies consisting of the U.S. Department of Energy (DOE), the U.S. Environmental Protection Agency (EPA), and the Washington State Department of Ecology (Ecology).

Tri-Party Agreement: The Tri-Parties signed the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement) (Ecology et al., 1989) on May 15, 1989. The general purposes of the agreement are as follows: to ensure that environmental impacts are thoroughly investigated and appropriate response actions taken as necessary to protect human health and the environment; to provide a framework for permitting of treatment, storage, and disposal units; to ensure compliance with the *Resource Conservation and Recovery Act of 1976* (RCRA) and the Washington Hazardous Waste Management Act (RCW 70.105D) for treatment, storage, and disposal units; to establish a procedural framework and schedule for developing, prioritizing, implementing, and monitoring appropriate response actions at the Hanford Site in accordance with CERCLA, the NCP, Superfund guidance and policy, and RCRA guidance and policy; and to facilitate cooperation, exchange of information, and coordinated participation of the parties in such actions.

Vadose zone: The unsaturated soil between the land surface and the groundwater.

Waste site: Any location that may require action to mitigate a potential human health or environmental impact and includes contaminated or potentially contaminated sites from past operations. Contamination may be contained in environmental media (e.g., soil or groundwater) or in manmade structures or solid waste (e.g., debris).

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