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Revision 0

Action Memorandum for the Time-Critical Removal Action for Support Activities to the 200-UW-1 Operable Unit

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

United States
Department of Energy
P.O. Box 550
Richland, Washington 99352

Approved for Public Release;
Further Dissemination Unlimited

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ACRONYMS

ACM	asbestos-containing material
ARAR	applicable or relevant and appropriate requirement
CERCLA	*Comprehensive Environmental Response, Compensation and Liability Act of 1980*
CFR	Code of Federal Regulations
CWC	Central Waste Complex
DOE	U.S. Department of Energy
DOE-RL	U.S. Department of Energy, Richland Operations Office
Ecology	Washington State Department of Ecology
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
ESD	Explanation of Significant Differences
ETF	200 Areas Effluent Treatment Facility
FFS	focused feasibility study
LLW	low-level waste
mrem/yr	millirem per year
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
OU	operable unit
PCB	polychlorinated biphenyl
pCi/g	picocurie per gram
PP	proposed plan
ppm	parts per million
PRG	preliminary remediation goal
RCRA	*Resource Conservation and Recovery Act of 1976*
RCW	Revised Code of Washington
ROD	record of decision
TBC	to be considered
TEDF	Treated Effluent Disposal Facility
Tri-Parties	U.S. Department of Energy, Washington State Department of Ecology, and U.S. Environmental Protection Agency
Tri-Party Agreement	*Hanford Federal Facility Agreement and Consent Order*
TSCA	*Toxic Substances Control Act of 1976*
TSD	treatment, storage, and/or disposal
UO_3	uranium trioxide
USC	United States Code

VCP	vitrified clay pipe
WAC	Washington Administrative Code

ACTION MEMORANDUM FOR THE TIME-CRITICAL REMOVAL ACTION FOR SUPPORT ACTIVITIES TO THE 200-UW-1 OPERABLE UNIT

1.0 PURPOSE AND SCOPE

1.1 PURPOSE

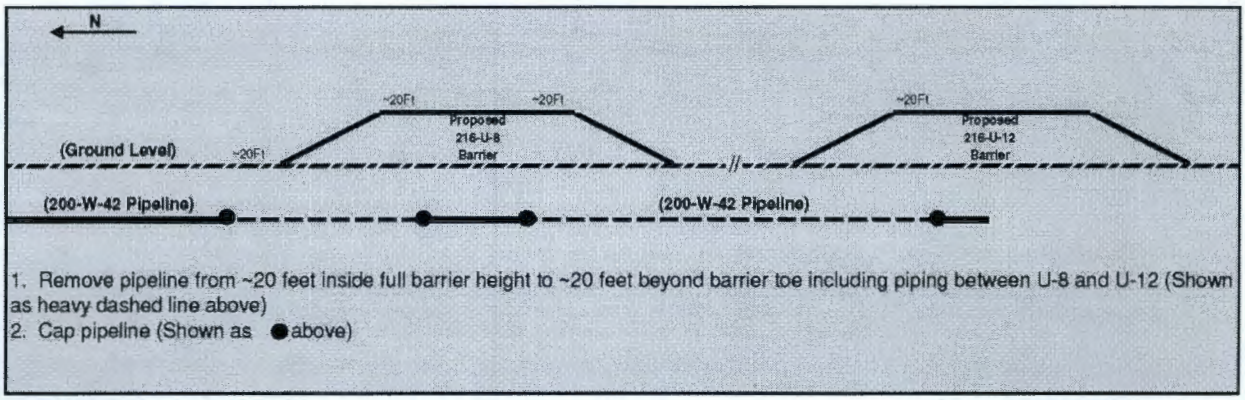
This Action Memorandum documents approval of the time-critical removal action to support the proposed barrier installations for 216-U-8 and 216-U-12 Cribs, located on the Hanford Site, Richland, Washington. The barrier installations are proposed in the 200-UW-1 focused feasibility study (FFS) (*Focused Feasibility Study for the 200-UW-1 Operable Unit*, DOE/RL-2003-23) and proposed plan (PP) (*Reissued Proposed Plan for the 200-UW-1 Operable Unit*, DOE/RL-2003-24).

This removal action supports minimization of potential releases of hazardous substances from the 216-U-8 and 216-U-12 Cribs that could adversely impact human health and the environment, is protective of site personnel and the environment, and contributes to the efficient performance of the proposed 200-UW-1 Operable Unit (OU) remedial actions.

1.2 SCOPE

To support the proposed remedial action of barrier installations over the 216-U-8 and 216-U-12 Cribs (see Figure 1-1), and in order to take advantage of existing work force capabilities and to avoid adverse weather conditions that could delay cleanup efforts, the following activities have been identified for this removal action:

- Excavate approximately 400 feet of the 200-W-42 Pipeline, sample pipeline trench, and then backfill the trench area (sampling of the trench will provide characterization data that will be of used for other removal and remedial activities, such as the Groundwater and the 200-IS-1 and the 200-UW-1 OU projects);
- Reroute approximately 830 feet of the Treated Effluent Disposal Facility (TEDF) line and remove or stabilize approximately 100 feet of the wastewater pipeline;
- Complete or partially remove a 100-foot by 150-foot concrete slab;
- Remove and seal 3 vent risers; and
- Relocate any miscellaneous markers or utilities.



NOTE: Effluent source information is discussed in Section 2.2.

Figure 1-1. Proposed Construction of Crib Barriers (i.e., U-8 and U-12) and Removal, Treatment, and Disposal of 200-W-42.

2.0 SITE CONDITIONS AND BACKGROUND

The 216-U-8 and 216-U-12 Cribs are two of the U Plant Area Waste Sites in the 200 West Area of the Hanford Site. Highway 240 is to the southwest of the U Plant Area Waste Sites, and the Columbia River is north-northwest of the removal action area.

2.1 BACKGROUND

A 45-day public comment and review period was held from May 16, 2005 through June 30, 2005 on the PP for the 200-UW-1 OU (DOE/RL-2003-24), which includes the 200-W-42 pipeline waste site. The proposed plan was prepared to evaluate remedial action alternatives for the U Plant Area Waste Sites. The comments and responses will be contained in the administrative record for the 200-UW-1 OU.

Consistent with the Central Plateau strategy and the ongoing effort to accelerate cleanup at the Hanford Site, the U.S. Department of Energy (DOE) has partnered with the Washington State Department of Ecology (Ecology) and the U.S. Environmental Protection Agency (EPA) to identify new approaches for the Central Plateau cleanup process. One of these approaches is the geographic area closure concept (DOE/RL-2002-68, *Hanford Groundwater Management Plan: Accelerated Cleanup and Protection*). The geographic-based cleanup goals are (1) to reduce environmental risks and protect underlying groundwater by addressing high-risk waste sites and (2) to accelerate remediation of the Hanford Site. In addition, economies of scale could be realized by performing remediation of waste sites within a given geographic area as an integrated activity.

Several remedial actions and construction activities will be required to support the construction of the surface barriers. These support activities cannot be initiated as part of the 200-UW-1 remedial action until the Record of Decision (ROD) is issued, and either confirms or disproves the recommended remedial alternatives. Also, the 216-U-12 crib is a *Resource Conservation and Recovery Act* (RCRA) *of 1976* treatment, storage, and/or disposal (TSD) unit. As such it is subject to closure and corrective action requirements under Washington Administrative Code (WAC) 173-303-610 and -645. A *Hanford Federal Facility and Consent Order* (Tri-Party Agreement) change package proposes to change the 216-U-12

status to a Past Practice unit, which allows it to be addressed by a *Comprehensive Environmental Response, Compensation and Liability Act* (CERCLA) *of 1980* remedial action. Until and if the support activities can be incorporated into an approved ROD, DOE proposes to conduct the support activities as a time-critical removal action. The support activities are consistent (do not preclude) any of the remedial alternatives evaluated in the FFS and PP. There are less than 6 months to plan for the proposed actions, because the DOE, Ecology, and EPA (Tri-Parties) want to finish construction of the proposed surface barriers by September 30, 2006.

2.2 FACILITY DESCRIPTION

This section describes portions of the 200-UW-1 OU, specifically the 200-W-42 Pipeline, which is within the scope as described in Section 1.2 of this time-critical removal action, and summarizes the chemical and radiological processes that resulted in discharges to the 216-U-8 and 216-U-12 Cribs through the 200-W-42 Pipeline. In general, process wastes generated during operation or deactivation were discharged to cribs, as well as other waste disposition areas.

The primary liquid-waste generating processes in the U Plant Area and the associated building locations in the U Plant Area include the following:

- Uranium Recovery Process — 221-U Facility
- UO_3 Conversion Process — 224-U Building
- Solvent Treatment — 276-U Solvent Handling Building
- Analytical Laboratory Programs — 222-U Laboratory.

Liquid wastes often were discharged to the soil column via several types of structures in the U Plant Area including cribs, French drains, a reverse well, trenches, and septic systems. The 200-W-42 Pipeline carried the effluent, by gravity flow, to the 216-U-8 and 216-U-12 Cribs. Detailed information on 216-U-8 and 216-U-12 Cribs is contained in the 200-UW-1 FFS (DOE/RL-2003-23).

200-W-42 Pipeline

The 200-W-42 Pipeline is one of the process lines, sometimes referred to as transfer lines or process sewer lines, connecting the major process facilities with each other and with their waste-handling facilities or waste sites. Transfer lines to liquid effluent disposal facilities (e.g., cribs) from the U Plant and ancillary facilities were constructed of a variety of materials including vitreous clay and galvanized metal. The 200-W-42 Pipeline is a vitrified clay pipe (VCP) six inches in diameter. The pipe is buried 8 to 15 feet belowgrade, and it runs from the 221-U Plant to the 216-U-8 Crib, and then to the 216-U-12 Crib.

2.3 RELEASES OR THREATENED RELEASE INTO THE ENVIRONMENT OF A HAZARDOUS SUBSTANCE OR POLLUTANT OR CONTAMINANT

This section provides a summary of the nature and extent of contamination for the 200-W-42 VCP. The results are described in detail in BHI-00033, DOE/RL-95-13, DOE/RL-95-106, DOE/RL-2003-23, Rev. 0, Appendix C, and DOE/RL-2003-24.

In the vitrified clay section of the pipeline, many of the joints were dislodged; the degree of dislodgment varied from very minor to very serious, and silty sandy material was observed. The stainless steel section

of the pipe was in excellent condition and the joints were sound. However, silty material also was observed in the pipe. Surface soil samples collected during the pipeline investigation typically showed background levels of activity for analyzed constituents. The highest levels of contamination were detected in the subsurface near the VCP. However, many constituents were distributed throughout the 4 m (12-ft) depth of the investigation. Lateral spreading (no more than 1 to 2 m [3 to 5 ft]) was apparent or detected at the depth of the investigation. The maximum concentrations of Am-241, Cs-137, Pu-239/240, and Sr-90 detected during the pipeline investigation were 426 pCi/g, 49100 pCi/g, 70.6 pCi/g, and 180 pCi/g, respectively. The highest strontium activity was detected in a vegetation sample at a concentration of 1380 pCi/g. Maximum concentrations of U-233/234 and U-238 were 38 pCi/g and 43 pCi/g, respectively.

Table 2-1 summarizes the contaminants detected during the initial sampling campaigns.

Table 2-1. Summary of Detected Contaminants.

Constituent Name	Constituent Name
Acetone	Pentachlorophenol
Americium-241	Plutonium-238
Antimony	Plutonium-239/240
Arsenic	Radium-226
Bis(2-ethylhexyl) phthalate	Radium-228
Bromomethane	Selenium
Cesium-134	Selenium-79
Cesium-137	Silver
Chloride	Strontium-90
Chloromethane	Sulfate
Chromium	Technetium-99
Di-n-butyl phthalate	Thallium
Europium-152	Thorium-232
Europium-154	Titanium
Fluoride	Toluene
Kerosene	Uranium
Mercury	Uranium-233/234
Methylene chloride	Uranium-234
Neptunium-237	Uranium-235
Nitrogen in nitrite and nitrate	Uranium-238

Additional characterization will be conducted as part of the removal action activities in accordance with an approved sampling and analysis plan. The additional sampling and analysis will be used to support waste designation for the soil, concrete slab and piping and risers, and to determine if the removal action objectives have been attained.

2.4 DISCUSSION OF RELEASE THREAT

This document describes hazards associated with the 200-W-42 waste site and the associated release/threat of release. Therefore, in addition to serving as a time-critical removal action memorandum, this document also serves as a removal site evaluation per 40 Code of Federal Regulations (CFR) 300.410.

3.0 THREATS TO HUMAN HEALTH OR THE ENVIRONMENT

As discussed in Section 2.3.3, and as shown by the risk assessment in the 200-UW-1 FFS, conditions persist wherein threats to the public health or the environment exist.

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR, Section 300.415(b)(2), establishes factors to be considered in determining the appropriateness of a removal action. One factor identified involves *weather conditions that may cause hazardous substances or pollutants or contaminants to migrate or be released.* Hazardous substances are present as both radiological and chemical contamination below the surface soils. Without some removal of the 200-W-42 Pipeline between the cribs, weather conditions such as rainfall, etc., will continue to contribute to the migration of contamination through the soil.

4.0 ENDANGERMENT DETERMINATION

The removal action proposed is necessary to protect the public health or welfare or the environment from actual or threatened releases of hazardous substances, including the spread of radioactive substances from the U Plant Area into the environment. Such a release or threat of release may present an imminent and substantial endangerment to public health, welfare, or the environment. The 200-UW-1 FFS (DOE/RL-2003-23) documents the threats to human health and the environment in Chapter 2.0 and Appendix C.

DOE will utilize CERCLA response authority whenever a hazardous substance is released, or there is a substantial threat of release, into the environment, and response is necessary to protect public health, welfare, or the environment. DOE Order 5400.4 requires DOE to respond to any release or substantial threat of a release of a hazardous substance into the environment in a manner consistent with CERCLA and the NCP, regardless of whether or not the release or threatened release is from a site listed on the National Priorities List.

5.0 PROPOSED ACTION AND ESTIMATED COST

The proposed action for the 200-W-42 Pipeline and other barrier support actions and the estimated cost is presented in the following sections.

5.1 PROPOSED ACTION

This removal action is an interim step in support of the 200-UW-1 OU Remedial Action and implements the remedial alternative identified in the FFS (DOE/RL-2003-23) and PP (DOE/RL-2003-24) for the 200-W-42 waste site. The 200-UW-1 FFS identifies remedial action objectives for the U Plant Area Waste Sites. The following remedial action objectives were developed specific to the 200-UW-1 OU:

- Remedial Action Objective 1 –Prevent unacceptable risk to human health and ecological receptors by exposure to nonradiological constituents in soils and debris at concentrations above the industrial use criteria, as defined in WAC 173-340-745(5).

- Remedial Action Objective 2 – Provide conditions suitable for future industrial land use and protect ecological receptors, respectively, by

  - Preventing exposure to radiological constituents at concentrations that will cause a dose rate limit of 15 mrem/yr above background for industrial workers (OSWER Directive 9200.4-31P, EPA/540/R-99/006, *Radiation Risk Assessment At CERCLA Sites: Q & A*). A dose rate limit of 15 mrem/yr above background generally achieves the EPA excess lifetime cancer risk threshold, which ranges from $1x10^{-6}$ to $1x10^{-4}$.

  - Protecting ecological receptors based on a dose rate limit of 0.1 rad/day for terrestrial wildlife populations [DOE-STD-1153-2002, *A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota*, which is a to-be-considered (TBC) criteria].

Remedial Action Objective 3[1] – Prevent migration of contaminants through the soil column to groundwater or reduce soil concentrations below WAC 173-340-747, "Deriving Soil Concentrations for Ground Water Protection," groundwater protection criteria so that no further degradation of the groundwater results from contaminant leaching from the 200-UW-1 OU waste sites.

Remedial Action Objective 4 – Prevent adverse impacts to cultural resources and threatened or endangered species, and minimize wildlife habitat disruption.

In the 200-UW-1 FFS, the preliminary remediation goals (PRGs) are identified, which are a numerical expression of the remedial action objectives. The remedial action objectives and PRGs are based on attainment of acceptable levels of human health and ecological risk. For the 200-UW-1 OU, including the 200-W-42 Pipeline, the PRGs are identified for individual hazardous substances identified as Contaminants of Concern.

Meeting the 200-UW-1 FFS PRG and the potential applicable or relevant and appropriate requirements (ARARs) and, by extension, achieving remedial action objectives, can be accomplished by reducing concentrations (or activities) of contaminants to remediation goal levels or by eliminating potential exposure pathways/routes. As noted above, the 200-UW-1 remedial action objectives serve as the removal action objectives, to the extent practicable. Similarly, the PRG for the remedial action also serves as the soil removal action cleanup level, to the extent practicable. If the removal action cleanup level is not met at 15 feet or underneath the pipeline, then the trench will be backfilled to control the spread of contamination, further analysis of potential risk to human health and the environment will be analyzed, and a remedy for the 200-W-42 Pipeline in association with the 200-UW-1 OU will be

[1] Note: Protection of the Columbia River from contaminants in this OU is achieved through Remedial Action Objective 3; there is no surface water in the immediate vicinity of the waste sites that requires a separate Remedial Action Objective.

evaluated by the Tri-Parties. All data collected during the removal action will be provided to the 200-UW-1 and 200-IS-1 OUs and the groundwater projects.

As shown by the risk assessment in the 200-UW-1 FFS (DOE/RL-2003-23), the 200-W-42 VCP waste site is contaminated with Cs-137 at levels that represent human health direct exposure and terrestrial wildlife exposure. Table 5-1 identifies the Cs-137 removal action cleanup levels at the 200-W-42 VCP waste site:

Table 5-1. Summary of Radionuclide Soil Removal Action Cleanup Level.[a]

Constituent	Overall Removal Action Cleanup Level[b] (pCi/g)
Cesium-137	23.4

[a] The removal action cleanup level is the same value as the PRG specified in the 200-UW-1 FFS. Accordingly, the removal action cleanup level presented herein is a numerical expression of the 200-UW-1 FFS remedial action objectives, and is intended to address the risks identified in the associated risk assessment for the 200-W-42 Pipeline.
[b] The listed value represents the most restrictive soil removal action cleanup level. The value represented is for screening purposes. Site-specific evaluation and modeling will be performed to determine if remedial action objectives have been attained.

In this removal action, soils will be removed to a maximum depth of 4.6 m (15 ft), or to below the engineered structure, whichever is deeper. If the removal action cleanup level is not met at 15 feet or underneath the pipeline, then the trench will be backfilled to control the spread of contamination, further analysis of potential risk to human health and the environment will be analyzed, and a remedy for the 200-W-42 Pipeline in association with the 200-UW-1 OU will be evaluated by the Tri-Parties. All data collected during the removal action will be provided to the 200-UW-1 and 200-IS-1 OUs and the groundwater projects.

Based on these considerations, Removal, Treatment, and Disposal was selected as the remedy for the 200-W-42 Pipeline between 216-U-8 and 216-U-12 Cribs and the barrier toe on each side of the cribs.

Structures (e.g., a slab and the TEDF Line) and soil within this area, with contaminant concentrations above the removal action cleanup levels would be removed using conventional techniques and would be disposed to an approved disposal facility, most probably the Environmental Restoration Disposal Facility (ERDF). Special precautions would be used to minimize the generation of onsite fugitive dust. Depending on the configuration of the area to be excavated, shoring might be required to comply with safety requirements and to reduce the quantity of excavated soil. The depth, and therefore the volume, of soil removed largely depend on which categories of removal action cleanup levels are exceeded.

Requirements for safety, monitoring, and sampling generally are well understood, especially at the Hanford Site, where numerous removal, treatment, and disposal actions have been implemented in radiological and hazardous environments. Radioactive waste requires special-handling protocols, but remote-controlled equipment is not necessary, based on process knowledge and observed concentrations of radionuclides from characterization activities. Removal technologies do not require that the precise extent of contamination be known before excavation. Rather, the extent of contamination is assessed as the excavation proceeds, and the extent of removal is adjusted accordingly. In this removal action, soils will be removed to a maximum depth of 4.6 m (15 ft), or to below the engineered structure, whichever is deeper. If the removal action cleanup level is not met at 15 feet or underneath the pipeline, then the trench will be backfilled to control the spread of contamination, further analysis of potential risk to human health and the environment will be analyzed, and a remedy for the 200-W-42 Pipeline in association with

the 200-UW-1 OU will be evaluated by the Tri-Parties. All data collected during the removal action will be provided to the 200-UW-1 and the 200-IS-1 OUs and the groundwater projects

Based on existing information, soil and/or debris removed from the waste sites are not anticipated to require ex situ treatment to meet disposal requirements at the ERDF or to reduce waste volumes. Contaminated soil will be containerized on site (e.g., containers, "burrito wraps," bulk shipment) and transported to the ERDF, located near the U Plant Area in the 200 West Area. Low-level radioactive waste and/or hazardous waste are acceptable for disposal at the ERDF, in accordance with the waste acceptance criteria (BHI-00139, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*).

After the clean cover and contaminated soil are removed, uncontaminated soil would be used to backfill the excavation. The backfill material could be found at a variety of sources, including local borrow pits and the excavated material that is determined to be clean.

5.2 COMMON ELEMENTS

Removal activities will result in generation of waste. The majority of the contaminated media likely will be designated as low-level waste (LLW); however, quantities of mixed waste, dangerous waste, and solid waste not contaminated with hazardous substances may be generated. Waste management ARARs are discussed in Section 5.3.1.

Waste generated will be disposed at an appropriate disposal site. Recycling and/or reuse options will be evaluated and implemented where possible to reduce the volume of material disposed.

Contaminated waste for which no reuse, recycle, or decontamination option is identified would be assigned an appropriate waste designation [e.g., solid, asbestos, polychlorinated biphenyl (PCB), radioactive, dangerous, or mixed] and disposed of at an approved disposal location. For the purposes of this action, most of the contaminated waste generated during implementation of this action is assumed to be disposed onsite at the ERDF in the 200 West Area. Alternate potential disposal locations may be considered when the removal action is performed if a suitable and cost effective location is identified. Alternate potential disposal locations will be evaluated using appropriate performance standards to assure that they are adequately protective of human health and the environment and contribute to efficient performance of future remedial actions.

ERDF is an engineered facility that provides a high degree of protection to human health and the environment and meets RCRA minimum technical requirements for landfills, including standards for a double liner, a leachate collection system, leak detection, monitoring, and final cover. Construction and operation of ERDF was authorized using a separate CERCLA ROD (EPA et al. 1995). The *U.S. Department of Energy Hanford Environmental Restoration Disposal Facility, Hanford Site, Benton County, Washington, Explanation of Significant Differences* (ESD) (EPA et al. 1996) modified the ERDF ROD (EPA et al. 1995 and 2002) to clarify the eligibility of waste generated during cleanup of the Hanford Site. Per the ESD, ERDF is eligible for disposal of any LLW, mixed waste, and hazardous/dangerous waste generated as a result of cleanup actions (e.g., removal action waste and investigation-derived waste), provided that the waste meets ERDF waste acceptance criteria and that appropriate CERCLA decision documents are in place.

The waste that will be generated under this removal action will fall within the definition of waste eligible for disposal at ERDF established in the ERDF ROD and subsequent ESD. Some waste may require treatment to meet ERDF waste acceptance criteria or RCRA land disposal restrictions. The type and

location of treatment will be documented in treatment plans developed as needed for each waste stream requiring treatment.

If other suitable locations for disposal of wastes are identified prior to the completion of implementation of the removal action (e.g., rubble from the demolished structures used as fill for nearby remedial actions), the alternate waste disposal location will be evaluated in accordance with the removal action objectives and the selected ARARs, and the removal action work plan's waste management section will be modified as appropriate.

While most waste that will be generated during the proposed removal action will likely meet ERDF waste acceptance criteria, some waste might not meet or might not be able to be treated to meet ERDF acceptance criteria. Specifically, this will include certain low-level radioactive and nonradioactive liquid waste that might be encountered or generated. Liquid waste containing levels of radioactive and/or nonradioactive hazardous substances meeting the 200 Areas Effluent Treatment Facility (ETF) waste acceptance criteria will be transferred to ETF and treated to meet ETF waste discharge criteria. Liquids that do not meet ETF waste acceptance criteria will be solidified and either disposed at ERDF (if ERDF waste acceptance criteria are met) or stored at the Central Waste Complex (CWC) subject to final disposition under CERCLA. Clean water (e.g., nonradioactive and nonhazardous) may be used for dust suppression during the pipe removal activities.

ERDF is considered to be onsite for management and/or disposal of waste from the removal action proposed in this document[2]. There is no requirement to obtain a permit to manage or dispose of CERCLA waste at the ERDF. It is expected that the great majority of the waste generated during the removal action proposed in this document can be disposed onsite at ERDF. For waste that must be sent offsite, including CWC, EPA must make a determination in accordance with 40 CFR 300.440 as to the acceptability of the proposed disposal site for receiving this CERCLA removal action waste. Since CWC is offsite for the management of CERCLA waste from this action, an offsite determination must be made by EPA prior to shipment of project waste to CWC.

5.3 APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS AND OTHER CRITERIA, ADVISORIES, OR GUIDANCE TO BE CONSIDERED

A requirement under other environmental laws may be either "applicable" or "relevant and appropriate," but not both. Identification of ARARs must be done on a site-specific basis and involves a two-part analysis: first, a determination whether a given requirement is applicable; then, if it is not applicable, a determination whether it is nevertheless both relevant and appropriate.

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[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 having to obtain a permit. Therefore, the ERDF 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.

Applicable requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law that specifically address a hazardous substance, pollutant, contaminant, remedial action, location, or other circumstance at a CERCLA site.

Relevant and appropriate requirements are those cleanup standards, standards of control, and other substantive environmental protection requirements, criteria, or limitations promulgated under Federal or State law 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.

To-Be-Considered information consists of nonpromulgated advisories or guidance issued by federal or state governments that are not binding legally and do not have the status of ARARs. As appropriate, TBCs should be considered in determining the removal action necessary for protection of human health and the environment. Requirements drawn from TBCs may be included in the selected alternative. Only documents associated with CERCLA onsite activities, such as the ERDF Waste Acceptance Criteria, are considered TBCs.

Because the alternatives would result primarily in waste generation and potential for air emissions, the key ARARs identified for the alternatives considered include waste management standards; standards controlling emissions to the environment; and environment, safety, and health standards. The ARARs are discussed generally in the following sections and are documented in detail in Tables 5-2 and 5-3.

5.3.1 Waste Management Standards

A variety of waste streams may be generated under the proposed removal action. It is anticipated that most of the waste will designate as LLW. However, quantities of dangerous or mixed waste, PCB-contaminated waste, and asbestos and asbestos-containing material (ACM) also could possibly be generated. The great majority of the waste will be in a solid form. However, some aqueous solutions might be generated.

The identification, storage, treatment, and disposal of hazardous waste and the hazardous component of mixed waste are governed by RCRA. The State of Washington, which implements RCRA requirements under WAC 173-303, has been authorized by the EPA to implement most elements of the RCRA program. The dangerous waste standards for generation and storage will apply to the management of any dangerous or mixed waste generated at the U Plant Area Waste Sites. Treatment standards for dangerous or mixed waste subject to RCRA land disposal restrictions are specified in WAC 173-303-140, which incorporates 40 CFR 268 by reference.

The management and disposal of PCB wastes are governed by the *Toxic Substances Control Act* (TSCA) *of 1976*, and regulations at 40 CFR 761. The TSCA regulations contain specific provisions for PCB waste, including PCB waste that contains a radioactive component. PCBs also are considered underlying hazardous constituents under RCRA and thus could be subject to WAC 173-303 and 40 CFR 268 requirements, if present in dangerous or mixed wastes.

Removal and disposal of asbestos and ACM are regulated under the *Clean Air Act* (40 CFR 61, Subpart M). These regulations provide for special precautions to prevent environmental releases or exposure to personnel of airborne emissions of asbestos fibers during removal actions. 40 CFR 61.52 identifies packaging requirements.

Waste that is designated as LLW that meets ERDF acceptance criteria is assumed to be disposed at ERDF, which is engineered to meet appropriate performance standards under 10 CFR 61. Alternate potential disposal locations may be considered when the removal action occurs if a suitable and cost effective location is identified. Any potential alternate disposal location will be evaluated for appropriate performance standards to assure that it is adequately protective of human health and the environment.

Waste designated as dangerous or mixed waste would be treated as appropriate to meet land disposal restrictions and ERDF acceptance criteria, and disposed at ERDF. ERDF is engineered to meet minimum technical requirements for landfills under WAC 173-303-665. Applicable packaging and pre-transportation requirements for dangerous or mixed waste generated at the U Plant Area Wastes Sites would be identified and implemented before movement of any waste.

Some of the aqueous waste designated as LLW, dangerous, or mixed waste could be transported to ETF for treatment and disposal. 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.

Waste designated as PCB remediation waste likely will be disposed at ERDF, depending on whether it is LLW and meets the waste acceptance criteria. PCB waste that does not meet ERDF waste acceptance criteria will be retained at a PCB storage area meeting the requirements for TSCA storage and will be transported for future treatment and disposal at an appropriate disposal facility.

Asbestos and ACM will be removed, packaged as appropriate, and disposed in ERDF.

The removal action will be performed in compliance with the waste management ARARs. Waste streams will be evaluated, designated, and managed in compliance with the ARAR requirements. Before disposal, waste will be managed in a protective manner to prevent releases to the environment or unnecessary exposure to personnel.

5.3.2 Standards Controlling Emissions to the Environment

The federal *Clean Air Act of 1990* and Amendments (42 United States Code 7401 et seq.), and the Washington Clean Air Act [Revised Code of Washington (RCW) 70.94] require regulation of air pollutants. Under federal implementing regulations, the 40 CFR 61, Subpart H requires that radionuclide airborne emissions from the facility shall be controlled so as not to exceed amounts that would cause an exposure to any member of the public of greater than 10 millirem per year effective dose equivalent. The same regulation addresses point sources (i.e., stacks or vents) emitting radioactive airborne emissions, requiring monitoring of such sources with a major potential for radioactive airborne emissions, and requiring periodic confirmatory measurement sufficient to verify low emissions from such sources with a minor potential for emissions. Under state implementing regulations, the federal regulations are paralleled by adoption, and in addition require added control of radioactive airborne emissions where economically and technologically feasible [WAC 246-247-040(3) and –040(4) and associated definitions]. In order to address the substantive aspect of these requirements, best or reasonable control technology will be addressed by ensuring that applicable emission control technologies (those reasonably operated in similar applications) will be utilized when economically and technologically feasible (i.e., based upon cost/benefit). Additionally, the substantive aspect of the requirements for monitoring of fugitive or non-point sources emitting radioactive airborne emissions [WAC 246-247-075(8)] will be addressed by sampling the effluent streams and/or ambient air as appropriate using reasonable and effective methods.

The federal implementing regulations also contain requirements for managing asbestos material associated with demolition and waste disposal (40 CFR 61, Subpart M).

The specific requirements pertaining to radioactive and nonradioactive air emissions for this action are in Tables 5-2 and 5-3.

Table 5-1. Identification of Federal Applicable or Relevant and Appropriate Requirements and To Be Considered for the Removal Action.

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
"Polychorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions," 40 CFR 761			
"Applicability," Specific Subsections: 40 CFR 761.50(b)(1) 40 CFR 761.50(b)(2) 40 CFR 761.50(b)(3) 40 CFR 761.50(b)(4) 40 CFR 761.50(b)(7) 40 CFR 761.50(c)	ARAR	These regulations establish standards for the storage and disposal of PCB waste.	The substantive requirements of these regulations are applicable or relevant and appropriate to the storage and disposal of PCB liquids, items, remediation waste, and bulk product waste at ≥ 50 ppm. The specific subsections identified from 40 CFR 761.50(b) reference the specific sections for the management of PCB waste type. The disposal requirements for radioactive PCB waste are addressed in 40 CFR 761.50(b)(7).
"National Emission Standards for Hazardous Air Pollutants," 40 CFR 61			
"Standard," 40 CFR 61.92	ARAR	Requires that emissions of radionuclides to the ambient air from DOE facilities shall not exceed amounts that would cause any member of the public to receive in any year an effective dose equivalent of 10 mrem/year.	Substantive requirements of this standard are applicable because this removal action may include activities such as decontamination and stabilization of contaminated structures, and operation of exhausters and vacuums, each of which may provide airborne emissions of radioactive particulates to unrestricted areas. As a result, requirements limiting emissions apply. This is a risk-based standard for the purposes of protecting human health and the environment.
"Emission Monitoring and Test Procedures," 40 CFR 61.93(b)(4)(i)	ARAR	Specifies that radionuclide emission measurements shall be made at all release points that have the potential to discharge radionuclides to the air in quantities that cause an effective dose equivalent in excess of 1% of the standard. The regulation also requires that all radionuclides that could contribute greater than 10% of the potential dose equivalent for a major release point be measured.	Substantive requirements of this standard are applicable because major point source emissions of radionuclides to the ambient air may result from activities, such as decontamination and stabilization of contaminated structures, and operation of exhausters and vacuums, performed during the removal action. This standard exists to ensure compliance with emission standards.
"National Emission Standard for Asbestos," 40 CFR 61 Subpart M; "Applicability," 40 CFR 61.140			
"Standard for Demolition and Renovation," 40 CFR 61.145	ARAR	Specifies that facilities are to be inspected for the presence of asbestos before demolition. The standard defines regulated asbestos-containing materials and establishes removal requirements based on quantity present and handling requirements. These requirements also specify handling and disposal requirements for regulated sources having the potential to emit asbestos. Specifically, no visible emissions are allowed during handling, packaging, and transport of asbestos-containing materials.	Although asbestos-containing materials are not anticipated, substantive requirements of this standard are applicable should this removal action include abatement of asbestos and asbestos-containing materials on pipelines or buried asbestos before demolition. As a result, there is potential to emit asbestos to unrestricted areas and the requirements for the removal, handling, and packaging of asbestos apply.

Table 5-1. Identification of Federal Applicable or Relevant and Appropriate Requirements and To Be Considered for the Removal Action.

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
"Standard for Waste Disposal for Manufacturing, Fabricating, Demolition, Renovation, and Spraying Operations," 40 CFR 61.150	ARAR	Identifies the requirements for the removal and disposal of asbestos from demolition and renovation activities.	Although asbestos-containing materials are not anticipated, the substantive requirements of this standard are applicable should asbestos-containing material be located during removal-action activities of associated pipelines and buried asbestos.
Regulations pursuant to the *Resource Conservation and Recovery Act of 1976* and implemented through WAC 173-303, "Dangerous Waste Regulations".			

40 CFR 61, "National Emission Standards for Hazardous Air Pollutants."
40 CFR 141, "National Primary Drinking Water Standards."
40 CFR 761, "Polychorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions."
WAC 173-303, "Dangerous Waste Regulations."

ARAR = applicable or relevant and appropriate requirement.
CFR = *Code of Federal Regulations.*
DOE = U.S. Department of Energy.
PCB = polychlorinated biphenyl.
TBC = to be considered.
WAC = Washington Administrative Code.

Table 5-2. Identification of State Applicable and Relevant or Appropriate Requirements and To Be Considered for the Removal Action.

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
"Dangerous Waste Regulations," WAC 173-303			
"Identifying Solid Waste," WAC 173-303-016	ARAR	Identifies those materials that are and are not solid waste.	Substantive requirements of these regulations are applicable because they define how to determine which materials are subject to the designation regulations. Specifically, materials that are generated for removal from the CERCLA site during the removal action would be subject to the procedures for identifying solid waste to ensure proper management.
"Recycling Processes Involving Solid Waste," WAC 173-303-017	ARAR	Identifies materials that are and are not solid waste when recycled.	Substantive requirements of these regulations are applicable because they define how to determine which materials are subject to the designation regulations. Specifically, materials that are generated for removal from the CERCLA site during the removal action would be subject to the procedures for identifying solid waste to ensure proper management.
"Designation of Dangerous Waste," WAC 173-303-070(3)	ARAR	Establishes the method for determining whether a solid waste is or is not a dangerous waste or an extremely hazardous waste.	Substantive requirements of these regulations are applicable to materials encountered during the removal action. Specifically, solid waste generated for removal from the CERCLA site during this removal action would be subject to the dangerous waste designation procedures to ensure proper management.
"Excluded Categories of Waste," WAC 173-303-071	ARAR	Describes those waste categories that are excluded from the requirements of WAC 173-303 (excluding WAC 173-303-050).	The conditions of this requirement are applicable to removal actions in the 200-UW-1 OU should waste identified in WAC 173-303-071 be encountered.

Table 5-2. Identification of State Applicable and Relevant or Appropriate Requirements and To Be Considered for the Removal Action.

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
"Conditional Exclusion of Special Wastes," WAC 173-303-073	ARAR	Establishes the conditional exclusion and the management requirements of special waste, as defined in WAC 173-303-040.	Substantive requirements of these regulations are applicable to materials encountered during the removal action. Specifically, the substantive standards for management of special waste are applicable to the interim management of certain waste that will be generated during the removal action.
"Requirements for Universal Waste," WAC 173-303-077	ARAR	Identifies waste exempted from regulation under WAC 173-303-140 and WAC 173-303-170 through 173-303-9907 (excluding WAC 173-303-960). This waste is subject to regulation under WAC 173-303-573.	Substantive requirements of these regulations are applicable to materials encountered during the removal action. Specifically, the substantive standards for management of universal waste are applicable to the interim management of certain waste that will be generated during the removal action.
"Recycled, Reclaimed, and Recovered Wastes," WAC 173-303-120 Specific Subsections: WAC 173-303-120(3) WAC 173-303-120(5)	ARAR	These regulations define the requirements for the recycling of materials that are solid and dangerous waste. Specifically, WAC 173-303-120(3) provides for the management of certain recyclable materials, including spent refrigerants, antifreeze, and lead-acid batteries. WAC 173-303-120(5) provides for the recycling of used oil.	Substantive requirements of these regulations are applicable to certain materials that might be encountered during the removal action. Recyclable materials that are exempt from regulation as dangerous waste and that are not otherwise subject to CERCLA as hazardous substances can be recycled and/or conditionally excluded from certain dangerous waste requirements.
"Land Disposal Restrictions," WAC 173-303-140(4)	ARAR	This regulation establishes state standards for land disposal of dangerous waste and incorporates by reference the Federal land disposal restrictions of 40 CFR 268 that are applicable to solid waste designated as dangerous or mixed waste in accordance with WAC 173-303-070(3).	The substantive requirements of this regulation are applicable to materials encountered during the removal action. Specifically, dangerous and/or mixed waste generated and removed from the CERCLA site during the removal action for offsite (as defined by CERCLA) land disposal would be subject to the identification of applicable land-disposal restrictions at the point of waste generation. The actual offsite treatment of such waste would not be ARAR to this removal action, but would be subject to all applicable laws and regulations.
"Requirements for Generators of Dangerous Waste," WAC 173-303-170	ARAR	Establishes the requirements for dangerous waste generators.	Substantive requirements of these regulations are applicable to materials encountered during the removal action. Specifically, the substantive standards for management of dangerous and/or mixed waste are applicable to the interim management of certain waste that will be generated during the removal action. For purposes of this removal action, WAC 173-303-170(3) includes the substantive provisions of WAC 173-303-200 by reference. WAC 173-303-200 further includes certain substantive standards from WAC 173-303-630 and -640 by reference.

Table 5-2. Identification of State Applicable and Relevant or Appropriate Requirements and To Be Considered for the Removal Action.

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
"Model Toxics Control Act -- Cleanup," WAC 173-340			
"Soil Cleanup Standards for Industrial Properties," WAC 173-340-745(5)(b)	ARAR	Identifies the methods used to identify risk-based concentrations and their use in the selection of a cleanup action. Cleanup and remediation levels are based on protection of human health and the environment, the location of the site, and other regulations that apply to the site. The standard specifies cleanup goals that implement the strictest Federal or state cleanup criteria.	The State-established risk-based concentrations for soils and protection of groundwater are relevant and appropriate to the 200-UW-1 OU waste site removal action because no Federal standard exists.
"Minimum Functional Standards for Solid Waste Handling," WAC 173-304			
"On-Site Containerized Storage, Collection and Transportation Standards for Solid Waste," WAC 173-304-200(2)	ARAR	Establishes the requirements for the onsite storage of solid waste that is not radioactive or dangerous waste.	Substantive requirements of these regulations are applicable to materials encountered during the removal action. Specifically, nondangerous, nonradioactive solid waste (i.e., hazardous substances that are only regulated as solid waste) that will be containerized for removal from the CERCLA site would be managed on site according to the substantive requirements of this standard.
"Solid Waste Handling Standards," WAC 173-350			
"On-Site Storage, Collection and Transportation Standards," WAC 173-350-300	ARAR	Establishes the requirements for the temporary storage of solid waste in a container on site and the collecting and transporting of the solid waste.	The substantive requirements of this newly promulgated rule are relevant and appropriate to the onsite collection and temporary storage of solid waste at the 200-UW-1 OU waste sites. Compliance with this regulation is being implemented in phases for existing facilities.
"Minimum Standards for Construction and Maintenance of Wells," WAC 173-160			
WAC 173-160-161	ARAR		The substantive requirements of this regulation are applicable to actions that include decommissioning of wells used for groundwater extraction, monitoring, or injection of treated groundwater or waste. The requirements of WAC 173-160-381 and WAC 173-160-460 are applicable to groundwater well construction, monitoring, or injection of treated groundwater or waste in the 200-UW-1 OU.
WAC 173-160-171	ARAR		
WAC 173-160-181	ARAR		
WAC 173-160-191	ARAR		
WAC 173-160-201	ARAR		
WAC 173-160-221	ARAR		
WAC 173-160-231	ARAR		
WAC 173-160-241	ARAR		
WAC 173-160-271	ARAR		
WAC 173-160-281	ARAR		
WAC 173-160-291	ARAR		
WAC 173-160-301	ARAR		
WAC 173-160-311	ARAR		
WAC 173-160-321	ARAR		
WAC 173-160-331	ARAR		
WAC 173-160-341	ARAR		
WAC 173-160-351	ARAR		
WAC 173-160-371	ARAR		
WAC 173-160-381	ARAR	Identifies the standard for decommissioning a well.	
WAC 173-160-400	ARAR		
WAC 173-160-420	ARAR		
WAC 173-160-430	ARAR		
WAC 173-160-440	ARAR		
WAC 173-160-450	ARAR		

Table 5-2. Identification of State Applicable and Relevant or Appropriate Requirements and To Be Considered for the Removal Action.

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
WAC 173-160-460	ARAR	Identifies the decommissioning process for resource protection wells.	
"General Regulations for Air Pollution Sources," WAC 173-400			
Washington Clean Air Act of 1967, Ch. 70.94 and Ch. 43.21A RCW General Regulations for Air Pollution, WAC 173-400 Specific subsection: WAC 173-400-040	ARAR	The regulation requires that all sources of air contaminants meet emission standards for visible, particulate, fugitive, odors, and hazardous air emissions. This section requires that all emission units use reasonably available control technology, which may be determined for some source categories to be more stringent than the emission limitations listed in this chapter.	Substantive requirements of the general standards for control of fugitive emissions are applicable to remedial actions at the site due to the generation of fugitive dust that occurs during demolition or other types of construction activities (e.g., construction of a barrier).
Specific subsection: WAC 173-400-113	ARAR	This regulation requires that methods of controls be employed to minimize the release of air contaminants resulting from new or modified sources of regulated emissions. Emissions are to be minimized through application of best available control technology.	Substantive requirements of this regulation would be applicable to remedial actions performed at the site if a treatment technology that emits regulated air emissions were necessary during the implementation of the remedial action.
Controls for New Sources of Toxic Air Pollutants, WAC 173-460 Specific subsections: WAC 173-460-030 WAC 173-460-060 WAC 173-460-070	ARAR	This regulation requires that emissions of toxic air contaminants listed in the regulation be quantified, and ambient impacts evaluated. Best available control technology for toxics shall be used as determined by the lead agency to protect human health and the environment.	Substantive requirements of these regulations would be applicable to remedial actions performed at the site, if a treatment technology that emits toxic air emissions were necessary during the implementation of the remedial action.
"Radiation Protection -- Air Emissions," WAC 246-247			
"Standards," WAC 246-247-040(3) WAC 246-247-040(4)	ARAR	Emissions shall be controlled to ensure that emission standards are not exceeded.	Substantive requirements of this standard are applicable because fugitive, diffuse and point source emissions of radionuclides to the ambient air may result from activities, such as open-air demolition of contaminated structures, excavation of contaminated soils, and operation of exhauster and vacuums, performed during the removal action. This standard exists to ensure compliance with emission standards.
"Monitoring, testing, and quality assurance," WAC 246-247-075	ARAR	Establishes the monitoring, testing, and quality assurance requirements for radioactive air emissions. Emissions from nonpoint and fugitive sources of airborne radioactive material shall be measured. Measurement techniques may include, but are not limited to sampling, calculation, smears, or other reasonable method for identifying emissions as determined by the lead agency.	Substantive requirements of this standard are applicable because fugitive and nonpoint source emissions of radionuclides to the ambient air may result from activities, such as open-air demolition of contaminated structures, excavation of contaminated soils, and operation of exhauster and vacuums, performed during the removal action. This standard exists to ensure compliance with emission standards.
To-Be-Considered pursuant to relevant facility acceptance criteria			

Table 5-2. Identification of State Applicable and Relevant or Appropriate Requirements and To Be Considered for the Removal Action.

ARAR Citation	ARAR or TBC	Requirement	Rationale for Use
Environmental Restoration Disposal Facility Waste Acceptance Criteria (BHI-00139)	TBC	This document establishes waste acceptance criteria for ERDF.	Waste destined for management at ERDF must meet acceptance criteria to ensure proper disposal.

40 CFR 61, Subpart H, "National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities."
Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9601, et seq.
Resource Conservation and Recovery Act of 1976, 42 USC 6901, et seq.
WAC 173-160, "Minimum Standards for Construction and Maintenance of Wells."
WAC 173-303, "Dangerous Waste Regulations."
WAC 173-304, "Minimum Functional Standards for Solid Waste Handling."
WAC 173-340, "Model Toxics Control Act -- Cleanup."
WAC 173-350, "Solid Waste Handling Standards."
WAC 173-400, "General Regulations for Air Pollution Sources."
WAC 173-460, "Controls for New Sources of Toxic Air Pollutants."
WAC 246-247, "Radiation Protection -- Air Emissions."

ARAR = applicable or relevant and appropriate requirement.
CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980.*
CFR = *Code of Federal Regulations.*
OU = operable unit.
RCRA = *Resource Conservation and Recovery Act of 1976.*
TBC = to be considered.
TSD = treatment, storage, and/or disposal.
WAC = Washington Administrative Code.

5.4 ESTIMATED COST

The cost to implement the removal action is presented in Table 5-4, and is cost effective for the 200-W-42 Pipeline because of shallow contamination.

Table 5-3. Total Cost for the U Plant Area Waste Sites 200-W-42 Pipeline Removal Action.

Action	Total Cost
	Present worth
Removal, Treatment, and Disposal	$ 2,019,500*

*Appendix F of the 200-UW-1 FFS contains the backup cost estimate information. For the 200-W-42 Pipeline, since approximately one-half of the pipeline is being removed, one-half of the Appendix F cost estimate has been identified.

5.5 PROJECT SCHEDULE

The U Plant Area Waste Sites removal action activities are scheduled to begin in November 2005.

The U Plant Area 200-W-42 pipeline sampling and analysis plan will be approved by EPA and Ecology. The removal action work plan, which will include the waste management plan will be submitted to Ecology prior to field activities for review and approval and will be implemented as written and approved.

6.0 EXPECTED CHANGE IN THE SITUATION SHOULD ACTION BE DELAYED OR NOT TAKEN

Severe weather can create conditions amenable to radiological releases, as can the aging of engineered controls (e.g., pipelines). These conditions could result in an unplanned release through piping deterioration and soil migration of contaminants. This may cause a threat to human health and the environment by direct exposure to nearby personnel and the environment, and exposure to the public through groundwater and possibly airborne radioactive contaminants.

7.0 OUTSTANDING POLICY ISSUES

There are no outstanding policy issues for this removal action.

8.0 SELECTED ACTION

The preferred action for the 200-W-42 VCP is Removal, Treatment, and Disposal, which provides overall protection of human health and the environment, complies with ARARs, and is cost effective.

This removal action is consistent with and contributes to the efficient performance of the remedial action proposed at this site.

9.0 REFERENCES

BHI-00033, *Surface and Near Surface Field Investigation Data Summary Report for the 200-UP-2 Operable Unit*, Bechtel Hanford, Inc., Richland, Washington.

BHI-00034, *Borehole Summary Report for the 200-UP-2 Operable Unit, 200 West Area*, Bechtel Hanford, Inc., Richland, Washington.

BHI-00139, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*, Bechtel Hanford, Inc., Richland, Washington.

DOE/RL-91-19, *RCRA Facility Investigation/Corrective Measures Study Work Plan for the 200-UP-2 Operable Unit,* U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-95-13, *Limited Field Investigation for the 200-UP-2 Operable Unit,* U.S. Department of Energy, Richland, Washington.

DOE/RL-92-24, Rev. 2, *Hanford Site Background Part 1, Soil Background for Nonradioactive Analytes*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-95-106, *Focused Feasibility Study for the 200-UP-2 OU*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-96-12, *Hanford Site Background: Part 2, Soil Background for Radionuclides*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-98-28, 1999, *200 Areas Remedial Investigation/Feasibility Study Implementation Plan – Environmental Restoration Program*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2000-60, *Uranium-Rich/General Process Condensate and Process Waste Group Operable Units RI/FS Work Plan and RCRA TSD Unit Sampling Plan; Includes: 200-PW-2 and 200-PW-4 Operable Units*, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2002-68, *Hanford Groundwater Management Plan: Accelerated Cleanup and Protection,* U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2003-23, *Focused Feasibility Study for the 200-UW-1 Operable Unit*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE/RL-2003-24, Revision 0, April 29, 2005, *Reissued Proposed Plan for the 200-UW-1 Operable Unit,* U.S. Department of Energy, Richland Operations Office, Richland, Washington.

DOE STD-1153-2002, *A Graded Approach for Evaluating Radiation Doses to Aquatic and Terrestrial Biota*, U.S. Department of Energy, Washington, D.C.

EPA, Ecology, and DOE, 1995 and 2002, *Environmental Restoration Disposal Facility Record of Decision*, U.S. Environmental Protection Agency, State of Washington Department of Ecology, and U.S. Department of Energy, Richland Operations Office, Richland, Washington.

EPA, Ecology, and DOE, 1996, *U.S. Department of Energy Hanford Environmental Restoration Disposal Facility, Hanford Site, Benton County, Washington, Explanation of Significant Difference (ESD)*, U.S. Environmental Protection Agency, State of Washington Department of Ecology, and U.S. Department of Energy, Richland Operations Office, Richland, Washington.

OSWER Directive 9200.4-31P, EPA/540/R-99/006, *Radiation Risk Assessment at CERCLA Sites: Q&A*, U.S. Environmental Protection Agency, Washington, D.C.

PNNL-14187, *Hanford Site Groundwater Monitoring for Fiscal Year 2002*, Pacific Northwest National Laboratory, Richland, Washington.

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DOE APPROVAL SIGNATURE

The following signature page (Approval-1 of 2) provides documented agreement between the DOE and the Ecology for the ACTION MEMORANDUM FOR THE TIME-CRITICAL REMOVAL ACTION FOR 200-UW-1 OPERABLE UNIT BARRIER SUPPORT. Conditions at the site meet the NCP section 300.415(b)(2) criteria for a removal action. The total estimated cost for the project is $2,019,500.

_____ _____

Keith A. Klein, Manager
Richland Operations Office
U.S. Department of Energy

Date

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ECOLOGY APPROVAL SIGNATURE

The following signature page (Approval-2 of 2) provide documented agreement between the DOE and the Ecology for the ACTION MEMORANDUM FOR THE TIME-CRITICAL REMOVAL ACTION FOR 200-UW-1 OPERABLE UNIT BARRIER SUPPORT. Conditions at the site meet the NCP section 300.415(b)(2) criteria for a removal action. The total estimated cost for the project is $2,019,500.

_____ _____

Mike A. Wilson, Manager
Hanford Project Office
Washington State Department of Ecology

Date

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