0084350

DOE/RL-2009-37
Revision 0

Action Memorandum for Non-Time-Critical Removal Action for 200-MG-2 Operable Unit

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

U.S. DEPARTMENT OF ENERGY

Richland Operations Office

P.O. Box 550
Richland, Washington 99352

RECEIVED
DEC 17 2009
EDMC

Approved for Public Release;
Further Dissemination Unlimited

DOE/RL-2009-37
Revision 0

Action Memorandum for Non-Time-Critical Removal Action for 200-MG-2 Operable Unit

Date Published
October 2009

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

U.S. DEPARTMENT OF ENERGY
Richland Operations Office

P.O. Box 550
Richland, Washington 99352

Release Approval Date 10/13/2009

Approved for Public Release;
Further Dissemination Unlimited

TRADEMARK DISCLAIMER

Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors.

This report has been reproduced from the best available copy.

Printed in the United States of America

Executive Summary

This action memorandum requests and documents approval of the U.S. Department of Energy proposed *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*[1] non-time-critical removal actions for the 200-MG-2 Operable Unit. Confirmatory sampling/no further action was selected as the preferred action for sixteen of the 200-MG-2 Operable Unit waste sites. Removal, treatment, and disposal was selected as the preferred action for eighteen of the 200-MG-2 OU waste sites. The removal actions for the 200-MG-2 Operable Unit will minimize the release or threat of release of hazardous substances that pose a risk to human health and the environment. Completion of the removal actions will protect personnel and provide an end state consistent with commitments of Ecology, et al., 1989, *Hanford Federal Facility Agreement and Consent Order*.[2] The U.S. Department of Energy is seeking the U.S. Environmental Protection Agency's review and concurrence on this action memorandum.

[1] *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*, 42 USC 9601, et seq. Available at: http://www4.law.cornell.edu/uscode/42/usc_sec_42_00009601----000-.html.

[2] Ecology, EPA, and DOE, 1989, *Hanford Federal Facility Agreement and Consent Order*, 2 vols., as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington. Available at: http://www.hanford.gov/?page=91&parent=0.

Contents

1. Purpose **1**

2. Site Background and Conditions **1**

2.1 Other Actions to Date 2

2.2 EPA, State, and Local Authorities Role 5

3. Threats to Human Health or the Environment **5**

4. Endangerment Determination **5**

5. Proposed Actions and Estimated Costs **6**

5.1 Confirmatory Sampling/No Further Action 7

5.2 Removal, Treatment, Disposal 8

5.3 Description of Alternative Technologies 9

5.4 Applicable or Relevant and Appropriate Requirements 9

5.5 Project Costs 9

5.6 Project Schedule 10

6. Expected Change in the Situation Should Action Be Delayed or Not Taken **10**

7. Outstanding Policy Issues **10**

8. Recommendation **10**

9. References **10**

Appendices

A. Public Comments and Responsiveness Summary ..... A-i

B. Waste Site Attributes ..... B-i

C. Applicable or Relevant and Appropriate Requirements ..... C-i

Terms

ARAR	applicable or relevant and appropriate requirement
bgs	below ground surface
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	*Code of Federal Regulations*
COPC	contaminants of potential concern
CS/NFA	confirmatory sampling/no further action
DOE	U.S. Department of Energy
Ecology	Washington State Department of Ecology
EE/CA	engineering evaluation/cost analysis
EPA	U.S. Environmental Protection Agency
NCP	"National Oil and Hazardous Substances Pollution Contingency Plan" (40 CFR 300)
NPL	"National Priorities List" (40 CFR 300, Appendix B)
OU	operable unit
RAL	removal action level
RTD	removal, treatment, and disposal
Tri-Party Agreement	Ecology et al., 1989a, *Hanford Federal Facility Agreement and Consent Order*
Tri-Party Agreement Action Plan	Ecology et al., 1989b, *Hanford Federal Facility Agreement and Consent Order Action Plan*
WAC	*Washington Administrative Code*

This page intentionally left blank.

1. Purpose

This action memorandum requests and documents approval of the U.S. Department of Energy (DOE) proposed *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA), non-time-critical removal actions for the 200-MG-2 Operable Unit (OU). The proposed removal actions for the 200-MG-2 OU will minimize the release or threat of release of hazardous substances that pose a risk to human health and the environment.

A 30-day public comment and review period (May 27, 2009 through June 26, 2009) was held for DOE/RL-2008-45, *Engineering Evaluation/Cost Analysis for the 200-MG-2 Operable Unit Waste Sites*, which provides an analysis of the alternatives considered for these removal actions. Comments received generally supported implementation of these actions. The administrative record includes the public comments. Appendix A includes a summary of the comments and associated responses. Responses to public comments did not result in changes to DOE/RL-2008-45; however, a comment received from the Oregon Department of Energy concerning groundwater was addressed by adding a removal action objective (Section 5, third removal action objective).

The U.S. Environmental Protection Agency (EPA) Region 10 was consulted on the engineering evaluation/cost analysis (EE/CA) and agrees with the selected removal action for the waste sites identified under the 200-MG-2 OU. The DOE is seeking EPA's review and concurrence on this action memorandum.

2. Site Background and Conditions

The Hanford Site encompasses approximately 1,517 km^2 (586 mi^2) in the Columbia River Basin of south-central Washington State. In 1989, the EPA placed the 100, 200, 300, and 1100 Areas of the Hanford Site on the National Priorities List (NPL) (40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan," [NCP] Appendix B, "National Priorities List"). The 200 Area NPL site contains the 200 East and 200 West Areas (including waste management facilities and inactive irradiated fuel-reprocessing facilities) and the 200 North Area (formerly used for interim storage and staging of irradiated fuel). The 200 Area NPL includes the 200-MG-2 OU and its assigned waste sites.

The 200-MG-2 OU includes 69 wastes sites in the 200 Area. The waste sites include French drains, trenches, cribs, ditches, and retention basins with shallow contamination (generally less than 4.6 m [15-ft] deep). This OU also includes waste sites where chemical and radioactive contaminants were released as a result of leaks or spills (i.e., unplanned release sites). This action memorandum addresses only the waste sites anticipated to have a direct exposure to human health and ecological receptors from zero to 4.6 m (15 ft). The assumed shallow nature of these waste sites is based on the volume of liquid discharge, lack of mobility of contaminants, and shallow depth of discharge. These sites are not anticipated to impact groundwater. Thirty-four of the waste sites (presented in Table 1 and Figure 1) were evaluated in the 200-MG-2 OU EE/CA. The remaining 35 waste sites were not included in the EE/CA because either a structure or contamination exceeded 4.6 m (15 ft) below ground surface and/or the waste site was in an area where removal, treatment, and disposal may not be consistent with a final remedy. The remaining 35 200-MG-2 waste sites will be evaluated as part of the remedial investigation/feasibility study to support a final decision.

All of the waste sites contained within the 200-MG-2 OU are located with the Industrial-Exclusive Zone as defined in DOE/EIS-0222-F, *Final Hanford Comprehensive Land Use Plan Environmental Impact Statement* and DOE/EIS-0222-SA-01, *Supplement Analysis Hanford Comprehensive Land-Use Plan Environmental Impact Statement*, and within the Core Zone as defined in DOE/RL-2005-57, *Hanford End State Vision*. Figure 1 shows the boundary of the Industrial-Exclusive Zone around the 200 Area.

Table 1. 200-MG-2 Operable Unit Waste Sites Considered for Removal Actions from DOE/RL-2008-45

Waste Site Code	Waste Site Type	Waste Site Code	Waste Site Type	Waste Site Code	Waste Site Type
200-E-4	French Drain	216-S-18	Trench	216-U-3	French Drain
200-E-25	French Drain	216-S-25	Crib	216-U-14	Ditch
207-Z	Retention Basin	216-SX-2	Crib	216-Z-13	French Drain
207-A-NORTH	Retention Basin	216-T-1	Ditch	216-Z-14	French Drain
207-S	Retention Basin	216-T-4-1D	Ditch	2704-C-WS-1	French Drain
207-T	Retention Basin	216-T-4-2	Ditch	UPR-200-E-9	Unplanned Release
207-U	Retention Basin	216-T-9	Trench	UPR-200-E-17	Unplanned Release
209-E-WS-2	French Drain	216-T-10	Trench	UPR-200-W-103	Unplanned Release
216-A-41	Crib	216-T-11	Trench	UPR-200-W-111	Unplanned Release
216-B-51	French Drain	216-T-12	Trench	UPR-200-W-112	Unplanned Release
216-C-4	Crib	216-T-13	Trench	--	--
216-S-12	Trench	216-T-33	Crib	--	--

Appendix B provides details on each of the 34 waste sites.

2.1 Other Actions to Date

Previous stabilization activities have been implemented at 16 of the 34 waste sites. Stabilization activities included removing contaminated soil and backfilling with clean soil. Additional stabilization activities included placing clean soil on top of waste sites to ensure that contamination could not migrate via the wind. All 16 waste sites were evaluated in the EE/CA. The previous stabilization activities, while consistent with the proposed actions, have not eliminated the potential threat to human health or the environment. Appendix B contains additional information regarding previous actions.

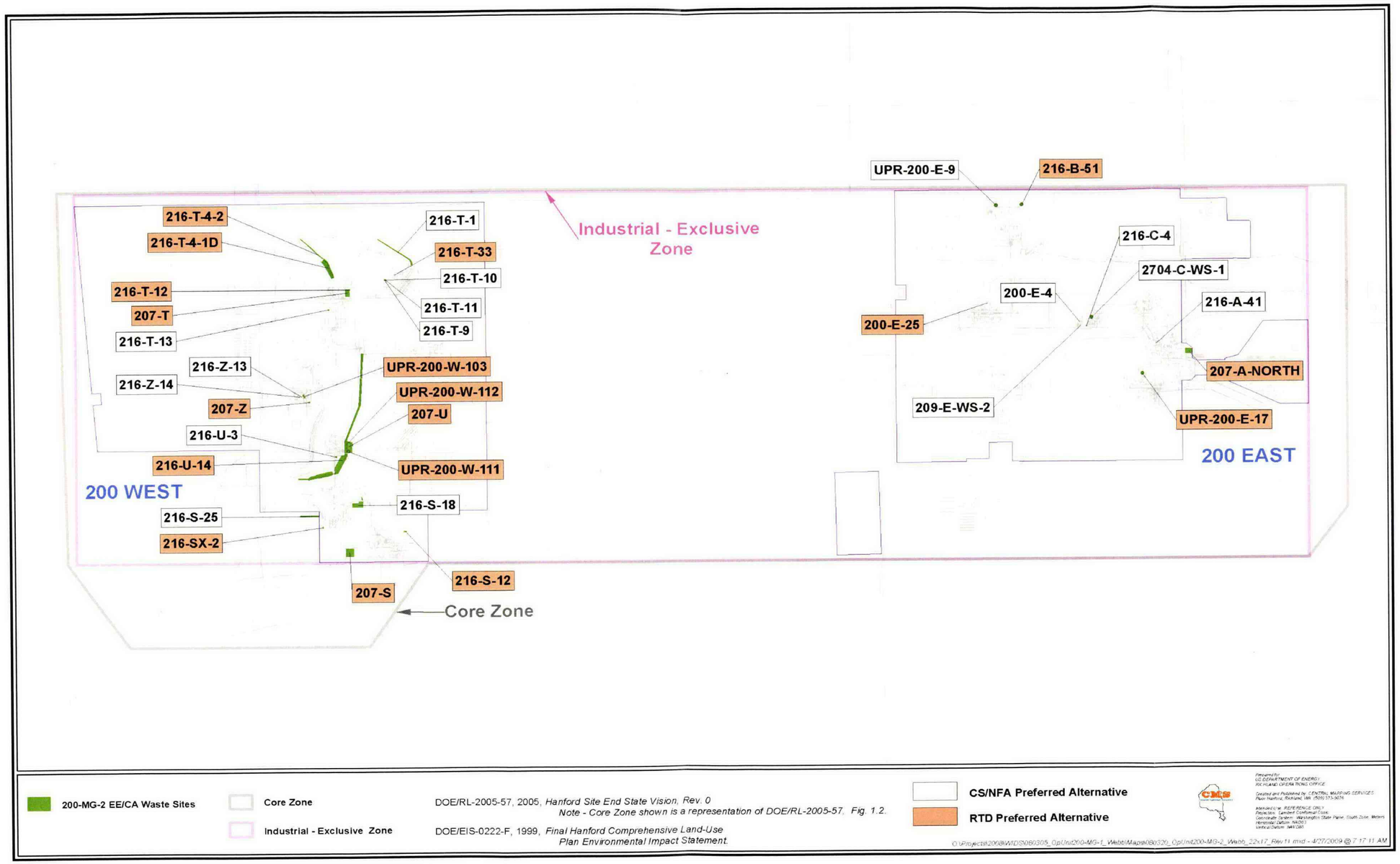

Figure 1. The 34 200-MG-2 OU Waste Sites and Preferred Alternatives

This page intentionally left blank.

2.2 EPA, State, and Local Authorities Role

As waste sites listed on the NPL, the 200-MG-2 OU sites are subject to cleanup action under CERCLA. Appendix C of Ecology et al., 1989b, *Hanford Federal Facility Agreement and Consent Order Action Plan* (Tri-Party Agreement Action Plan), lists the 200-MG-2 OU waste sites. The removal actions in this action memorandum will be consistent with the anticipated final remedial action decisions, as required by 40 CFR 300.415(d), "Removal Action." Activities undertaken for cleanup are performed in accordance with the NCP and Tri-Party Agreement.

The President is given authority by Section 104 of CERCLA, when there is a threat to public health or welfare of the United States or to the environment, to take any appropriate removal action to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or the threat of release. This authority is delegated to DOE, as CERCLA Lead Agency, through Executive Order 12580, *Superfund Implementation*.

EPA is the lead regulatory agency for the 200-MG-2 OU. Per the Tri-Party Agreement, DOE is submitting this action memorandum to EPA for review of and concurrence with this removal action to help ensure consistency with ongoing or subsequent, related remedial actions."

3. Threats to Human Health or the Environment

The NCP, Section 300.415(b)(2), establishes factors to be considered in determining the appropriateness of a removal action. In particular, 40 CFR 300.415(b)(2)(i) states that "Actual or potential exposure to nearby human populations, animals, or the food chain from hazardous substances or pollutants or contaminants" is justification for performing a removal action. The lead agency may take any appropriate removal action to abate, prevent, minimize, stabilize, mitigate, or eliminate the release or the threat of release.

The identified waste sites have contaminants in soils largely at or near the surface. These contaminants may result in direct contact and external exposure to human health and ecological receptors. The potential threat of risks justifies a CERCLA non-time-critical removal action.

4. Endangerment Determination

Actual or threatened release of hazardous substances, including radioactive substances, from the 200-MG-2 OU waste sites may present an imminent and substantial endangerment to public health, welfare, or the environment if not addressed by implementing the response actions in this action memorandum.

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 is required to respond to any release or substantial threat of release of a hazardous substance into the environment in a manner consistent with CERCLA and the NCP.

5. Proposed Actions and Estimated Costs

DOE performed an EE/CA in which viable removal alternatives were evaluated for the disposition of contaminated soil and other materials against their performance to mitigate potential threats to human and ecological receptors. The removal action alternatives evaluated must meet the removal action objectives.

- Removal action objective 1: Prevent unacceptable risk to human health and ecological receptors from exposure to soils and/or debris contaminated with nonradiological constituents less than 4.6 m (15 ft) below ground surface (bgs) at concentrations above the appropriate removal action levels (RALs).
- Removal action objective 2: Prevent unacceptable risk to human health and ecological receptors from exposure to soils and/or debris contaminated with radiological constituents less than 4.6 m (15 ft) bgs at concentrations above the appropriate RALs.
- Removal action objective 3: Control the sources of groundwater contamination to minimize impacts to groundwater resources, protect the Columbia River from adverse impacts, and reduce the degree of groundwater cleanup that may be required under future actions.
- Removal action objective 4: Prevent adverse impacts to cultural resources and threatened or endangered species, and minimize wildlife habitat disruption.

The RALs for the waste sites identified in this action memorandum will be based on the removal action objectives noted above. These RALs will be developed and documented in the Removal Action Work Plan. These RALs will be based on attainment of acceptable levels of human health and ecological risk, but not lower than background levels or detection limits for waste sites. The RALs for waste sites will be based on a worker and protection of wildlife and groundwater. Attainment of RALs is intended to meet the first three Removal Action Objectives and is expected to satisfy the remedial action objectives established in the final record of decisions.

The descriptions of viable removal alternatives and the analysis of effectiveness, implementability, and cost are provided in detail in the EE/CA, Sections 4.0 and 5.0. The alternatives evaluated included the following:

- Alternative 1: No Action
- Alternative 2: Confirmatory Sampling/No Further Action (CS/NFA)
- Alternative 3: Removal, Treatment, and Disposal (RTD).

CERCLA requires the No Action alternative as a baseline for comparison with other removal action alternatives. No legal restrictions, institutional controls, or active measures are applied to the waste sites. The No Action alternative was not selected as the preferred action for any of the 200-MG-2 waste sites in DOE/RL-2008-45 because this alternative is not protective to human health or the environment. This alternative is not recommended as a proposed action. The proposed removal actions and estimated costs are presented in the following sections.

Newly discovered waste sites identified as similar or comparable to a 200-MG-2 OU waste site group for which removal action alternatives already have been developed and evaluated, will be added to that group through the plug-in approach as further described in DOE/RL-2008-45. Details on these groups of sites are included in the 200-MG-2 EE/CA (DOE/RL-2008-45), Table 2-1. The groupings are based on various factors such as types of releases (i.e., intentional or incidental), estimated volumes of contaminant release,

presence of engineered structures, and estimates of potential contamination depth. Confirmatory sampling may be required to determine whether a particular waste site meets the criteria for inclusion in a group. Discovery documentation and response to new waste sites is a routine activity at the Hanford Site. The CERCLA regulations, 40 CFR 300.405, "Discovery or Notification," Subsections (a)(3), (5), and (8), identify some ways that RL may discover "new" (previously unknown) waste sites at the Hanford Site. RL-TPA 90 0001, Tri Party Agreement Handbook Management Procedures, Guideline TPA MP 14, "Maintenance of the Waste Information Data System (WIDS)," describes how RL, Ecology, and EPA identify and document new waste sites. This action memorandum may be modified to include the disposition of waste sites added to this removal action. Modifications will be processed in accordance with Ecology et al., 1989b, Hanford Federal Facility Agreement and Consent Order Action Plan (Tri-Party Agreement Action Plan), Section 9.0, Documentation and Records through the use of Tri-Party Agreement Change Notice(s).

5.1 Confirmatory Sampling/No Further Action

Under the CS/NFA, sampling and analysis will be conducted to confirm that soil contaminant concentrations are at or below RALs and that no further action is required. Contaminants of potential concern (COPCs)[3] are not expected to exceed RALs. Radiological surveys will be included in the initial site investigation as appropriate for site conditions, to support the selection of sampling locations. A sampling and analysis plan and a removal action work plan will be developed. The sampling and analysis plan will contain the necessary information to support chemical and radionuclide data collection at a sufficient quantity and quality to determine whether RALs have been met.

The CS/NFA alternative was selected as the preferred action for 16 of the 200-MG-2 OU waste sites in the EE/CA. The waste sites and project costs are summarized in Table 2.

Table 2. Waste Sites with Proposed CS/NFA Removal Action

Waste Site Code	Waste Site Type	Present Worth (FY 2008 $)	Waste Site Code	Waste Site Type	Present Worth (FY 2008 $)
200-E-4	French Drain	$180,000	216-T-10	Trench	$168,000
209-E-WS-2	French Drain	$168,000	216-T-11	Trench	$168,000
216-A-41	Crib	$180,000	216-T-13	Trench	$180,000
216-C-4	Crib	$180,000	216-U-3	French Drain	$180,000
216-S-18	Trench	$180,000	216-Z-13	French Drain	$180,000
216-S-25	Crib	$180,000	216-Z-14	French Drain	$180,000
216-T-1	Ditch	$180,000	2704-C-WS-1	French Drain	$180,000
216-T-9	Trench	$168,000	UPR-200-E-9	Unplanned Release	$180,000
Total Present Worth for CS/NFA Sites: $2,832,000					

FY = fiscal year

[3] DOE/RL-2008-45 provides the list of COPCs.

If results of CS indicate that the CS/NFA is inappropriate (i.e., soil concentrations greater than the RALs), then the RTD action will be implemented or the waste site will be removed from the action memorandum authority and will be evaluated as part of the final remedy for 200-MG-2 OU.

5.2 Removal, Treatment, Disposal

Under the RTD action, sampling and analysis will typically be conducted to confirm that soil contains COPCs above RALs and requires removal. Mixed and/or radioactive waste streams are expected to be generated for this removal action alternative. Segregation of nondangerous, solid waste stream is not necessary for this removal action. However, where process knowledge and information are available to make a determination, removal actions may be conducted without prior confirmation sampling to remove and dispose of soil and other materials above RALs, with treatment as required for disposal. Through verification sampling and analysis, remaining in situ solid will be demonstrated to be at or below RALs for waste sites contaminated with either nonradionuclides or nonradionuclides and radionuclides.

In this action, soils will be removed until the RALs are achieved, generally to a depth of less than 4.6 m (15 ft).[4] Direct radiological surveys without additional sampling and analysis may be used for verifying that radiological contamination is below RALs for waste sites contaminated only with radionuclides for which the isotopic ratios have been established.

In some cases, excavation beyond 4.6 m (15 ft) may be required. These cases include waste sites where removal of an engineered structure is required, or where verification sampling indicates that deeper excavation is required to attain RALs. If waste sites are encountered with contamination deeper than 4.6 m (15 ft) bgs, then soil samples will be taken at depths greater than 4.6 m (15 ft) to characterize potential groundwater risk drivers. In general, for waste sites with contamination greater than 15 ft, the waste site will be deferred to remedial investigation/feasibility study activities to determine an appropriate cleanup approach. The on-scene coordinator (in consultation with EPA) will determine whether excavation to greater depths during the removal action is justified to remove soil with concentrations greater than the RALs. A decision matrix for determining the path forward in this situation will be included in the removal action work plan.

The RTD alternative was selected as the preferred action for 18 of the 200-MG-2 waste sites in the EE/CA. The waste sites and project costs are summarized in Table 3.

Table 3. Waste Sites with Proposed RTD Removal Action

Waste Site Code	Waste Site Type	Present Worth (FY 2008 $)	Waste Site Code	Waste Site Type	Present Worth (FY 2008 $)
200-E-25	French Drain	$401,000	216-T-4-1D	Ditch	$1,607,000
207-A North	Retention Basin	$1,711,000	216-T-4-2	Ditch	$2,784,000
207-S	Retention Basin	$1,227,000	216-T-12	Trench	$413,000
207-T	Retention Basin	$2,617,000	216-T-33	Crib	$470,000
207-U	Retention Basin	$2,617,000	216-U-14	Ditch	$6,007,000

[4] Throughout this action memorandum, 15 ft is discussed as a maximum depth at which RALs would be achieved. Should final 200-MG-2 OU remedial actions be selected, which provide for excavation to achieve RALs at a different depth, then that new depth would supersede the requirement of this action memorandum.

Table 3. Waste Sites with Proposed RTD Removal Action

Waste Site Code	Waste Site Type	Present Worth (FY 2008 $)	Waste Site Code	Waste Site Type	Present Worth (FY 2008 $)
207-Z	Retention Basin	$857,000	UPR-200-E-17	Unplanned Release	$192,000
216-B-51	French Drain	$469,000	UPR-200-W-103	Unplanned Release	$411,000
216-S-12	Trench	$527,000	UPR-200-W-111	Unplanned Release	$501,000
216-SX-2	Crib	$519,000	UPR-200-W-112	Unplanned Release	$501,000
Total Present Worth for RTD sites:		**$23,831,000**			

FY = fiscal year

If sampling results indicate that the RTD is inappropriate (i.e., at or below RALs), then the CS/NFA action will be implemented.

5.3 Description of Alternative Technologies

Because the waste sites contain shallow contamination that can be removed easily, alternative technologies were not evaluated.

5.4 Applicable or Relevant and Appropriate Requirements

The NCP (40 CFR 300) requires that the removal actions described in this document substantively comply with applicable or relevant and appropriate requirements (ARARs) to the extent practicable. Appendix C identifies and describes specific regulatory sections that are ARAR to the removal actions.

5.5 Project Costs

The present-worth costs for the proposed removal actions are presented in Table 4. The cost estimates can be found in SGW-38475, *Cost Estimate for the 200-MG-2 Operable Unit Engineering Evaluation/Cost Analysis Removal Actions.*

Table 4. Summary of the Proposed Removal Actions

Proposed Removal Action	Number of Waste Sites	Present Worth (FY 2008 $)
CS/NFA	16	$2,832,000
RTD	18	$23,831,000
Total	34	$26,663,000

FY = fiscal year

5.6 Project Schedule

This action memorandum addresses 34 of the 200-MG-2 OU waste sites. The 200-MG-2 OU remediation field work will be completed by 2024. Sixteen removal actions will be completed by the end of calendar year 2018 and 18 removal actions will be completed by the end of calendar year 2022. The removal action work plan will include a project schedule in accordance with the Tri-Party Agreement Action Plan, Section 11.6.

6. Expected Change in the Situation Should Action Be Delayed or Not Taken

If action is delayed or not taken, waste site contaminants in soils largely at or near the surface may result in contaminants migrating in the environment or may result in direct exposure to human health and ecological receptors. If contamination migrates in the environment over time, the potential for worker, public, and environmental exposures, as well as removal costs, increases.

7. Outstanding Policy Issues

There are no policy issues associated with this removal action.

8. Recommendation

This decision document represents the selected removal action for the 200-MG-2 OU developed in accordance with CERCLA, as amended by the *Superfund Amendments and Reauthorization Act of 1986*, and is consistent with the NCP. The recommended removal action is a combination of Alternative 2, Confirmatory Sampling/No Further Action and Alterative 3, Removal, Treatment, and Disposal. Conditions at the site meet NCP 40 CFR 300.415(b)(2)(i) criteria for a removal action. This decision is based on the information provided in the administrative record for this project.

9. References

40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan," *Code of Federal Regulations*. Available at: http://www.access.gpo.gov/nara/cfr/waisidx_08/40cfr300_08.html.

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

40 CFR 300.405, Subsections (a)(3), (5), and (8), "Discovery of Notification," *Code of Federal Regulations*. Available at: http://edocket.access.gpo.gov/cfr_2008/julqtr/40cfr300.405.htm.

40 CFR 300.415, Subsections (b)(2), (b)(2)(i), and (d), "Removal Action," *Code of Federal Regulations*. Available at: http://edocket.access.gpo.gov/cfr_2007/julqtr/pdf/40cfr300.415.pdf.

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9601, et seq. Available at: http://www.epa.gov/oecaagct/lcla.html#Hazardous%20Substance%20Responses.

DOE/EIS-0222-F, 1999, *Final Hanford Comprehensive Land-Use Plan Environmental Impact Statement*, U.S. Department of Energy, Washington, D.C. Available at: www.hanford.gov/doe/eis/hraeis/hraeis.htm.

DOE/EIS-0222-SA-01, 2008, *Supplement Analysis Hanford Comprehensive Land-Use Plan Environmental Impact Statement*, Draft, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: http://www5.hanford.gov/arpir/?content=findpage&AKey=DA06917281.

DOE/RL-2005-57, 2005, *Hanford Site End State Vision*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: http://www.hanford.gov/docs/rbes/final.cfm.

DOE/RL-2008-45, 2009, *Engineering Evaluation/Cost Analysis for the 200-MG-2 Operable Unit Waste Sites*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: http://www5.hanford.gov/arpir/?content=detail&AKey=0906020197.

Ecology, EPA, and DOE, 1989a, *Hanford Federal Facility Agreement and Consent Order*, 2 vols., as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington. Available at: http://www.hanford.gov/?page=91&parent=0.

Ecology, EPA, and DOE, 1989b, *Hanford Federal Facility Agreement and Consent Order Action Plan*, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington.

Executive Order 12580, 1987, *Superfund Implementation*, Ronald Regan, January 23. Available at: http://www.archives.gov/federal-register/codification/executive-order/12580.html.

RL-TPA-90-001, 2007, *Tri-Party Agreement Handbook Management Procedure MP-14*, Rev. 1, U.S. Department of Energy - Richland Operations Office, U.S. Department of Energy – Office of River Protection, Washington Department of Health, U.S. Environmental Protection Agency, Richland, Washington. Available at: http://www.hanford.gov/hanford/files/TPA-MP14.pdf.

Superfund Amendments and Reauthorization Act of 1986. Available at: http://www.epa.gov/superfund/policy/sara.htm.

SGW-38475, 2008, *Cost Estimate for the 200-MG-2 Operable Unit Engineering Evaluation/Cost Analysis Removal Actions*, Rev. 0, Fluor Hanford, Inc., Richland, Washington. Available at: http://www5.hanford.gov/arpir/?content=detail&AKey=0809231025.

This page intentionally left blank.

DOE Approval Signature

The following signature pages (Approval 1 of 2) provide documented agreement between the DOE and EPA for the action memorandum for non-time-critical removal action at the 200-MG-2 OU. Conditions at the site meet the NCP 40 CFR 300.415(b)(2) criteria for a removal action. The total estimated cost for the project is $26,663,000.

Title: *Action Memorandum for Non-Time-Critical Removal Action for the 200-MG-2 Operable Unit*

Concurrence Matthew S. McCormick, Assistant Manager

U.S. Department of Energy, Richland Operations Office

Signature 11-20-09
Date

This page intentionally left blank.

EPA Concurrence Signature

Having considered the extent to which the action memorandum, DOE/RL-2009-37, *Action Memorandum for Non-Time-Critical Removal Action for 200-MG-2 Operable Unit*, Rev. 0, could be inconsistent with Comprehensive Environmental Response, Compensation, and Liability Act of 1980 processes or could alter schedules set forth in Appendix D of the *Hanford Federal Facility Agreement and Consent Order* (Tri-Party Agreement), the U.S. Environmental Protection Agency approves pursuant to Section 7.2.4 of the Tri-Party Agreement this Action Plan.

Title: *Action Memorandum for Non-Time-Critical Removal Action for the 200-MG-2 Operable Unit*

Concurrence Dennis A. Faulk, Program Manager

U.S. Environmental Protection Agency, Lead Regulatory Agency

12/10/09

Signature Date

This page intentionally left blank.

Appendix A

Public Comments and Responsiveness Summary

This page intentionally left blank.

A1 Responsiveness Summary

A1.1 Introduction

The purpose of this Responsiveness Summary is to summarize and respond to public comments on DOE/RL-2008-45, *Engineering Evaluation/Cost Analysis for the 200-MG-2 Operable Unit*. The engineering evaluation/cost analysis (EE/CA) was provided for public comment on May 27, 2009.

The Tri-Parties (Washington State Department of Ecology, U.S. Department of Energy, and U.S. Environmental Protection Agency) announced the issuance of the EE/CA in the *Tri-City Herald*. A 30-day public comment period was held during which time the public had the opportunity to read, review, and submit comments on DOE/RL-2008-45. There were no requests for a public meeting and no public meeting was held. The document identified and evaluated three alternatives for non-time critical removal actions for 34waste sites located on the Hanford Central Plateau under the *Comprehensive Environmental Response, Compensation and Liability Act of 1980* (CERCLA).

A1.2 Public Involvement

A newspaper ad appeared in the *Tri-City Herald* on May 27, 2009 announcing the availability of DOE/RL-2008-45 and the start of a 30-day public comment period. Approximately fifteen hundred copies of a fact sheet describing the EE/CA were mailed out or sent electronically. A public comment period was held from May 27 through June 26, 2009. No requests were received for a public meeting.

The agencies received written comments from four commenters during the public comment period. Three of the commenters agreed with the preferred alternatives and one requested all waste sites to have removal, treatment, and disposal as the preferred alternative. Comments covered a range of issues: 1) document is well written; 2) request for more-detailed information (e.g., cost) to be provided in the EE/CA; 3) clarification of terms (e.g., "removal" and "will" versus "may") and logic diagram; 4) if contamination is found it should be removed; 5) concern that enough sampling and characterization will be done; and 6) mobility of radionuclide contaminants is not well understood.

Responses to public comments did not result in changes to DOE/RL-2008-45. Commenters received responses to the comments submitted.

A1.3 Comments and Responses

COMMENTER:

Steve White

Comment 1: My preference is; Alternative 3: Remove, Treatment, and Disposal.

Response to Comment 1: Thank you for your interest in the engineering evaluation/cost analysis for the 200-MG-2 Operable Unit Waste Sites. All soil sample results will be compared to removal action levels (RALs). If the results show contamination above RALs, the Removal, Treatment, and Disposal Alternative will be implemented. If sample results are below RALs, the site is protective of human health and the environment and removal is not required.

COMMENTER:

Richard I. Smith, P.E.

Comment 1: This EE/CA is one of the better ones I have seen lately. The waste sites are well-described and the descriptions of alternatives and bases for selection of alternatives for each waste site are well-presented. However, there appears to be some flaws in the logic diagram that guides these selections, and information supporting the summarized cost estimates is essentially nonexistant. To obtain any information about the cost analysis methodology, assumptions, and bases, the reader is forced to review a very large document (SGW-38475, Cost Estimates for the 200-MG-2 Operating Unit EE/CA Removal Actions, Rev. 0), and there is no link provided in the EE/CA report to guide the reader to that supporting report on-line. The level of detail in this latter document is very complete, and well-supports the summarized cost information presented in the EE/CA. Some of the higher level cost methodology and assumptions contained in SGW-38475 should be presented in the EE/CA, to provide the reader with some basis for understanding how the summary costs were generated, without having to read through the much larger SGW-38475.

Response to Comment 1: Thank you for your positive feedback on DOE/RL-2008-45, *Engineering Evaluation/Cost Analysis for the 200-MG-2 Operable Unit Waste Sites*. The Tri-Parties appreciate your suggestion; however, the decision was made to not re-issue the EE/CA to include the information. In future documents, a link will be provided for the reader to access the detailed cost information.

Comment 2: There are several reoccurring phrases and statements throughout the EE/CA that seems incorrect. The first is the use of the phrase "removal action". Only one of the evaluated actions involves any removal, i.e., RTD. Thus, it would seem more correct and less confusing to use the phrase "remedial action" instead of "removal action". This change would apply to the discussions/definitions of RAOs and RALs as well.

Response to Comment 2: While the use of the term "removal action" may appear to be incorrect, the term "removal action" is used correctly throughout the document as defined in the *Comprehensive Emergency Response, Compensation and Liability Act of 1980* (CERCLA). The CERCLA definition of removal actions are short-term actions taken to cleanup or remove released hazardous substances or substances that might pose a threat of a release. Removal actions are categorized by the type of situation, the urgency of the threat of release and the subsequent time frame in which the action must be initiated.

The identified waste sites in the EE/CA have soil contamination at or near the surface. These contaminants could pose a threat to human health and ecological receptors through direct contact or external exposure. This potential threat warrants a CERCLA non-time-critical removal action.

Comment 3: The second reoccurring statement is the following: "If the removal (remedial) action levels are not met at 4.6 m (15 ft), then soil samples MAY be taken at depths greater than 4.6 m (15 ft) to characterize potential groundwater risk drivers. A decision matrix for determining the path forward in this situation will be included in the removal action work plan." If I understand the planned procedure, "soil samples WILL be taken at depths greater than 4.6 m (15 ft) to characterize potential groundwater risk drivers." Otherwise, there will be no basis for subsequent actions. It would seem appropriate to include in the EE/CA the decision matrix to be used to determine the path forward, so the reader is made aware of what those future actions might be for each situation. That matrix should be presented in the Summary, and again in the body of the report, together with the logic diagram, with any supporting information needed to explain the choices.

Response to Comment 3: The commenter is correct. Soil samples will be taken at depths greater than 4.6 m (15 ft.) below ground surface if contamination exceeds the removal action levels (RALs) to characterize potential groundwater risk drivers. The Tri-Parties will not re-issue the EE/CA to include such a matrix, but will consider ways to better present this information in future public documents.

Comment 4: The logic diagram appears to be incomplete. The first diamond should say "Are data available to determine WHETHER a specific waste site poses ANY current or potential threat to human health and the environment?" If the answer is yes, then all three remediation choices are possible. If the answer is no, an action box should be inserted into the diagram which says "Confirming sampling to determine the COCP concentrations at the site(s)" This box should be followed by the existing diamond, which should say "Are MEASURED COPC concentrations less than RALs?" The rest of the logic diagram remains as is.

Response to Comment 4: The logic diagram is not incomplete, in that for these waste sites, there is no available data. In addition, the ability to use data to determine an appropriate decision and action for each waste site must be maintained, including the need to preserve the option of confirmatory sampling/no further action in the EE/CA.

COMMENTER:

G. EDWARD REVELL, Chairman
Hanford Communities Governing Board

Comment 1: We are writing to you with regard to the draft EE/CA for 200-MG-2 Operable Unit. We were very pleased to learn the Department of Energy intends to do a much more comprehensive cleanup of the land being referred to as the "Outer Area" of the central plateau. This makes a lot of sense to us. If waste and contaminated soils can be removed, treated and disposed (RTD) of now it will prevent contaminants from moving through soil and vadose zone to groundwater and the Columbia River.

Response to Comment 1: Thank you for your comments on DOE/RL-2008-45, *Engineering Evaluation/Cost Analysis for the 200-MG-2 Operable Unit Waste Sites.*

Comment 2: We note in your fact sheet that the "Preferred Alternative" for 18 of the waste sites is RTD and we support that decision. We encourage you to proceed with "Confirmatory Sampling" for the remaining 16 sites and defer any decisions on those sites until the sample results are returned. If you determine that contamination could be a threat to human health and the environment, it should be removed.

Response to Comment 2: All soil sample results will be compared to removal action levels (RALs). If the results show contamination above RALs, the Removal, Treatment, and Disposal Alternative will be implemented. If sample results are below RALs, the site is protective of human health and the environment and removal is not required.

COMMENTER:

KEN NILES
Oregon Department of Energy
Salem, Oregon

Comment 1: Oregon appreciates the opportunity to comment on the "Engineering Analysis/Cost Analysis for the 200-MG-2 Operable Unit Waste Sites" (DOE/RL-2008-45, Rev. 0). This document is well written and the logic contained in the alternative reasoning is well thought out and scientifically based.

Response to Comment 1: Thank you for your feedback and comments on the DOE/RL-2008-45, *Engineering Evaluation/Cost Analysis for the 200-MG-2 Operable Unit Waste Sites.*

Comment 2: Oregon appreciates the flexibility in the analysis alternatives that allow the results of site-by-site sampling to determine whether the remove-treat-dispose decision process is appropriate at each site. This flexibility should produce a more protective, efficient, time saving and cost efficient approach to waste site remediation. Our only concern is that enough sampling and characterization, which was not discussed, will be performed to adequately determine whether each of the 200-MG-2 sites is to be treated with "confirmatory sampling/no further action" or "remove-treat-disposal" remediation.

Response to Comment 2: The removal action work plan will include a sampling and analysis plan (SAP). The SAP will be reviewed and approved by the lead regulatory agency prior to being implemented to address potential concerns on the adequacy of sampling and characterization.

Comment 3: However, in the discussion of Geology and Hydrogeology of the 200-MG-2 waste sites (section 2.1.4), the assumption was made that due to unsaturated conditions and the modeled lack of mobility of the contaminants, there would "not be a threat to groundwater quality." It has been sufficiently demonstrated that the mobility of the radionuclide contaminants is not particularly well understood (e.g., the 300 Area uranium plume), and that "undetermined" and misunderstood sources of vadose zone contamination continue to produce groundwater plumes (e.g., the 200 Area uranium plume). Therefore, it would appear that the current version of modeling of radionuclide sorption in the vadose zone does not accurately reflect the mobility of uranium and other contaminants in the subsurface. We urge you to take a more conservative stance.

Response to Comment 3: While the conceptual site model indicates these waste sites are not expected to impact groundwater, sampling will be done to verify this assumption. As part of the removal action process, the appropriate exposure pathways will be evaluated, including protection of groundwater. If a waste site does indicate the potential to impact groundwater at 4.6 m (15 feet) below ground surface, that waste site will be assigned to another operable unit and the waste site will be re-evaluated under a final remedial action for the potential to impact groundwater. Due to the nature of the waste sites and associated conceptual site model, vadose zone fate and transport modeling was not conducted. However, during development of the RALs, groundwater modeling will be used to develop groundwater protection values.

In addition, after further discussion with U.S. Environmental Protection Agency and Washington State Department of Ecology, a groundwater remedial action objective (RAO) will be added to the Action Memoranda's for this EE/CA, as well as for the 200-MG-1 EE/CA. The RAO will be as follows:

- Removal action objective 3: Control the sources of groundwater contamination to minimize impacts to groundwater resources, protect the Columbia River from adverse impacts, and reduce the degree of groundwater cleanup that may be required under future actions.

Comment 4: We look forward to continuing to work with DOE to clean up the Central Plateau in ways that are protective, effective, and economical. If you have any questions or comments about our recommendations, please contact Dale Engstrom of my staff at 503-378-5584.

Response to Comment 4: The Tri-Parties appreciate your feedback and continued involvement in Hanford cleanup issues.

Appendix B

Reprint of DOE/RL-2008-45, Appendix B

Reprint of DOE/RL-2008-45, *Engineering Evaluation/Cost Analysis for the 200-MG-2 Operable Unit Waste Sites*, Appendix B, "Waste Site Attributes," Rev. 0, May 2009.

This page intentionally left blank.

APPENDIX B

WASTE SITE ATTRIBUTES

This page intentionally left blank.

APPENDIX B

WASTE SITE ATTRIBUTES

This appendix presents the attributes of each site evaluated to determine the preferred removal action alternative. Table B-1 is organized by site type, which allows a row-by-row comparison by waste site type. The table also lists the attributes of the 200-MG-2 Operable Unit waste sites. The following attributes are given in the table:

- Waste site code
- Current status
- Waste site type
- Waste site name
- Facility area
- Physical setting
- Backfill status
- Surface cover status
- Surface cover thickness
- Site area, length, width, depth
- Potential contaminant interval
- Summary of prior cleanup activities
- Release mechanism
- Release type
- Potential constituents (radioactive and nonradioactive).

Waste site descriptions and other information are quoted directly from the Waste Information Data System database and other references. No modifications have been made to maintain consistent format, and references cited in those descriptions are not provided.

This page intentionally left blank.

Table B-1. Waste Site Attributes.

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Physical Setting	Back-fill (Y/N)	Surface Cover Present (Y/N)	Surface Cover Thickness (ft)	Site Area (ft^2)	Site Length (ft)	Site Width (ft)	Site Depth (ft)	Potential Cont. Interval (ft)	Prior Cleanup Activities	Release Mechanism	Release Type (Solid and/or Liquid)	Potential Constituents	
																	Radioactive	Nonradioactive
216-A-41	Inactive	Crib	216-A-41, Crib, 291-AR Stack Drain, 296-A-13 Stack Drain	PUREX Area	Crib	N	Y	1-2	100.0	10.0	10.0	7.0	7-15	The crib was deactivated by removing the stack drainage piping from 296-A-13 Stack. The stack drainage was then rerouted to the vessel vent seal pot system of the 244-AR building.	Stack condensate	Liquid	Less than 1 curie total beta activity. Tritium, Co-60, Sr-90, and Cs-137 in April 1979.	Unk.
216-C-4	Inactive	Crib	216-C-4, 216-C-4 Crib	Semi-Works Area	Crib	N	Y	1-2	200.0	20.0	10.0	16.0	16-20	Surface stabilized in 2000 with clean backfill material in January 2000. A portion of the security fence was removed to provide access to the crib for sterilization activities and future surveillance surveys. The site was deactivated in 1965 by valving out the effluent pipeline when the specific retention capacity was reached. In 1979, the 216-C-1, 216-C-3, 216-C-4, and 216-C-5 Cribs were decontaminated and the ground surface stabilized against wind erosion and plant root invasion. The 1979 work included blading 10 cm (4 in.) of ground surface and covering with a 10 cm (4-in.) sand pad, applying tureabor herbicide at the rate of 450 kg/hectare (500 lb/acre), installing 10-mil plastic sheeting over the entire surface, adding an additional 30.5 cm (12-in.) layer of sand over the plastic and 10 cm (4 in.) of pit run gravel on the surface.	Contaminated effluent	Liquid	Unk.	170,000 L of organic waste
216-S-25	Inactive	Crib	216-S-25, 216-S-25 Crib	200 W Ponds Area	Crib	N	N	0	5750.6	575.0	10.0	10.0	10-20	None	Steam condensate	Liquid	Unk.	Unk.
216-SX-2	Inactive	Crib	216-SX-2, 216-SX-2 Crib	S/U Farm Area	Crib	N	N	0	2281.6	75.3	30.3	6.8	6.8-15	In 2000, the vent risers were sealed to prevent potential passive radioactive emissions.	Compressor house waste	Liquid	Unk.	Unk.
216-T-33	Inactive	Crib	216-T-33, 216-T-33 Crib	T Plant Area	Crib	N	Y	7	210.0	30.0	7.0	10.8	11-15	The site has been surface stabilized.	Equipment decontamination waste	Liquid	Cs-137, Sr-90	None
216-T-1	Inactive	Ditch	216-T-1, 221-T Ditch, 221-T Trench, 216-T-1 Trench	T Plant Area	Ditch	Y	Y	1-2	4401.2	1467.0	3.0	10.0	10-15	The ditch was backfilled and stabilized in 1995. The ditch was permanently isolated by filling the manholes with concrete and cutting and capping the discharge pipes.	Steam condensate/ cooling water	Liquid	Unk.	Unk.
216-T-4-1D	Inactive	Ditch	216-T-4-1D, 216-T-4 Ditch, 216-T-4 Swamp	T Farm Area	Ditch	Y	Y	1-2	6800.7	850.0	8.0	4.0	4-15 (localized)	Ditch was backfilled and covered with clean dirt (1995). The 216-T-4-1 Ditch was surface stabilized along with the 216-T-4-2 Replacement Ditch in 1995.	Steam condensate/ cooling water	Liquid	Plutonium	Unk.
216-T-4-2	Inactive	Ditch	216-T-4-2, 216-T-4-2 Ditch	WM Area	Ditch	Y	Y	1-2	14000.7	1750.0	8.0	4.0	4-15 (localized)	Backfilled and surface stabilized in 1995. Site has grass cover. Manhole along the effluent pipeline filled with concrete. The ditch was backfilled and interim stabilized by BHI in July 1995 under a WHC Tank Farm work order. Permanent isolation was accomplished by filling the last manhole along the effluent pipeline with concrete (ECN-W-291-50 and 65).	Steam condensate/ cooling water	Liquid	Plutonium	Unk.

Table B-1. Waste Site Attributes.

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Physical Setting	Back-fill (Y/N)	Surface Cover Present (Y/N)	Surface Cover Thickness (ft)	Site Area (ft^2)	Site Length (ft)	Site Width (ft)	Site Depth (ft)	Potential Cont. Interval (ft)	Prior Cleanup Activities	Release Mechanism	Release Type (Solid and/or Liquid)	Potential Constituents	
																	Radioactive	Nonradioactive
216-U-14	Inactive	Ditch	216-U-14, 216-U-14 Ditch, Laundry Ditch	T Plant Area	Ditch	Y	Y	Minimum 2.0	45444.4	5680.3	8.0	10.0	10-15 (localized)	The entire ditch has been backfilled and surface stabilized (the areas were covered with a minimum of 0.61 m (2 ft) of clean dirt). Deactivation and stabilization for this site occurred in stages, beginning with the northern portion in 1984. The majority of the ditch had been backfilled and stabilized by 1995. The last portion to be eliminated was the portion located west of Cooper Avenue, where the ditch terminated into 216-U-10 Pond. It had been previously filled with large cobbles and continued to receive a small amount of effluent from 242-S until 1995. Although the effluent discharge ceased in 1995, this section was not downposted to URM status until 1997, when the cobbles were covered with "pit run" gravel. The laundry facility waste effluent was eliminated in 1981 and rerouted to a new crib (216-W-LWC). Discharge from the 224-U Facility was eliminated in 1993. The portion of the ditch that received effluent from the 207-U Retention Basin was permanently isolated by filling the 207-U Retention Basin outlet pipe with concrete in 1994. The portion of the ditch from the 207-U Basin to the east side of Cooper Ave. was interim stabilized by Tank Farms Operations in January 1995. The remaining discharge portion of the ditch west of Cooper Ave. (receiving effluent from the 242-S Evaporator) was deactivated by capping the discharge pipe capped on April 11, 1995. Outlet valves leading to the 216-U-14 ditch are locked and tagged closed. This completes both the Tri-Party and DOE-RL Agreement milestones to cease discharge to the unit.	Multiple miscellaneous effluent releases	Liquid	Radiological survey showed collected tumbleweeds with 4000 to 10,000 dpm in 1997. 1981 sampling detected Cs-137, Sr-90, U-238, Co-60, Pu-239/240, (Tin and Tc-99)	Unk.
200-E-25	Inactive	French Drain	200-E-25, 272-BB French Drain, Insulation Shop French Drain, Miscellaneous Stream #659	B Plant Area	French Drain	N	N	0	3.1	None	2.0	9.0	9-10	In the building from where the contamination came, the sink has been removed and drain was plugged with concrete.	Effluent from a sink and floor drain	Liquid	None	Asbestos, calcium silicate, fiberglass, silicate, "Airball" (an insulation cover material), latex paint, organic chemicals, oil, and grease.
200-E-4	Inactive	French Drain	200-E-4, Critical Mass Laboratory Dry Well North, 209-E North Dry Well, Miscellaneous Stream #730	Semi-Works Area	French Drain	N	N	0	12.5	None	4.0	11.0	0-15	One auger hole was drilled 0.25 m through the French drain.	Steam condensate	Liquid	None	Ba, Cu
209-E-WS-2	Inactive	French Drain	209-E-WS-2, Critical Mass Lab French Drain	Semi-Works Area	French Drain	N	N	0	12.1	None	4.0	8.0	8-9	None	Steam condensate	Liquid	None	None

Table B-1. Waste Site Attributes.

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Physical Setting	Back-fill (Y/N)	Surface Cover Present (Y/N)	Surface Cover Thickness (ft)	Site Area (ft^2)	Site Length (ft)	Site Width (ft)	Site Depth (ft)	Potential Cont. Interval (ft)	Prior Cleanup Activities	Release Mechanism	Release Type (Solid and/or Liquid)	Potential Constituents	
																	Radioactive	Nonradioactive
216-B-51	Inactive	French Drain	216-B-51, 216-BY-9 Crib	B Farm Area	French Drain	N	Y	1-2	19.6	None	5.0	15.0	0-20	Surface Stabilized in 1992. The 216-B-51 French Drain had been located inside a large, posted Surface Contamination Area known as UPR-200-E-144 (alias UN-216-E-44). In 1992, UPR-200-E-144 was surface stabilized. The contaminated soil on and around 216-B-51 was removed and consolidated onto the 216-B-7A/B and 216-B-11A/B cribs. The 216-B-51 French Drain was then posted "Underground Radiation Material."	Process waste effluent	Liquid	Less than 10 curies total beta/gamma in March 1993. Maximum direct reading of 18,000 dpm/100 cm^2 beta/gamma was found on concrete structure and wood cover from rad survey in April 2006.	Tri- butyl phosphate
216-U-3	Inactive	French Drain	216-U-3, 216-U-11, 216-U-3 French Drain	S/U Farm Area	French Drain	Y	N	0	28.3	None	6.0	12.0	12-15	By 1955, the waste in the 241-U-104 and 241-U-110 tanks was no longer boiling. The condensers were no longer needed so the piping to the crib was valved out. Before 1985 it was backfilled, but then the cave-in was noticed. Cave-in was backfilled later and the site was posted with URM signs. In December 2004, a characterization borehole (C4559) was drilled through the French drain.	Steam condensate	Liquid	None	Hg, Se
216-Z-13	Active	French Drain	216-Z-13, 234-5 Dry Well #1, 216-Z-13 Dry Well, Miscellaneous Stream #261, 216-Z-13 A and B	PFP Area	French Drain	Y	N	0	7.1	None	3.0	16.0	9-17	The effluent source was isolated.	Steam condensate	Liquid	None	None
216-Z-14	Inactive	French Drain	216-Z-14, 234-5 Dry Well #2, 216-Z-14 Dry Well, Miscellaneous Stream #262, 216-Z-14 A and B	PFP Area	French Drain	Y	N	0	7.1	None	3.0	16.0	9-17	None	Steam condensate	Liquid	Unk.	Unk.
2704-C-WS-1	Inactive	French Drain	2704-C-WS-1, 2704-C French Drain, Gatehouse French Drain	Semi-Works Area	French Drain	N	Y	1-2	Unk.	Irr.	Irr.	Unk.	0-15	Building demolished in 1998. The area and drain where the building stood was covered with gravel and posted with URM signs.	Steam condensate	Liquid	Unk.	Unk.
207-A-NORTH	Inactive	Retention Basin	207-A-NORTH, 207-A, 207-A Retention Basin, 207-A-NORTH Retention Basin, 207-A North	200 E Ponds Area	Retention Basin	N	N	0	550.0	55.0	10.0	7.0	7-15	Physically isolated and ceased to operate in Nov. 1999. A 4-in. (10 cm) fill line enters each basin, approximately 2 ft (0.6 m) long (inside basin structure) and a 3-in. (7.6 cm) drain line exits. A polyurethane sealant was added to the basin walls in 1982. Prior to the installation of the haplon liner, the basins had been posted as a CA. Each of the three basins is 16.8 m (55 ft) long, 3.0 m (10 ft) wide at the bottom, and 2.1 m (7 ft) deep with a total capacity of 790,000 L (210,000 gal).	Steam condensate	Liquid	Unk.	Unk.
207-S	Inactive	Retention Basin	207-S, REDOX Retention Basin, 207-S Retention Basin	200 W Ponds Area	Retention Basin	Y	Y	2	16900.0	130.0	130.0	6.8	0-8	Surface stabilized in 1993.	Cooling water/steam condensate	Liquid	9000 cpm beta/gamma in September 1981.	Unk.

Table B-1. Waste Site Attributes.

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Physical Setting	Back-fill (Y/N)	Surface Cover Present (Y/N)	Surface Cover Thickness (ft)	Site Area (ft^2)	Site Length (ft)	Site Width (ft)	Site Depth (ft)	Potential Cont. Interval (ft)	Prior Cleanup Activities	Release Mechanism	Release Type (Solid and/or Liquid)	Potential Constituents	
																	Radioactive	Nonradioactive
207-T	Inactive	Retention Basin	207-T, T Plant Retention Basin, 207-T, 207-T Retention Basin	T Farm Area	Retention Basin	Y	Y	2-3	302o1.0	246.0	123.0	o.5	0-15	0.8 m - 0.46 m of contaminated soil was scraped from another site and deposited on the bottom of this basin, then capped with 0.46 m - 1.07 m of clean dirt. In 199o, the basin was backfilled with contaminated soil from adjacent areas and capped with 2 ft of clean dirt. An area north of the 207-T Basin was originally designated as UPR-200-W-1oo (alias UN-21o-W-311). The contaminated soil was scraped and placed on top of the 21o-T-14 through 21o-T-17 Trenches and covered with clean soil in 1992. When additional contamination was identified east of the 207-T Basins in 1994, it was assumed to be from the same source and also called UPR-200-W-16o. The contaminated soil east of the 207-T Basins was scraped and placed inside the basins as fill material in 199o. To distinguish between the area remediated in 1992 and the contamination placed into the 207-T Basin in 199o, the latter has been given a separate WIDS site code of 200-W-53. Interim stabilization of the 207-T Retention Basin and an area of surface soil contamination located east of the basins (200-W-53 alias UPR-200-W-1o6), was completed in May 199o. Three to eighteen inches of the contaminated soil was scraped from 200-W-53 (UPR-200-W-1o6) and deposited in the bottom of the basin. The basin was then capped with 18 to 24 in. of clean dirt. The area was downposted from an SCA to URM.	Process cooling water/steam condensate/ contaminated soil	Liquid	Unk.	Unk.
207-U	Inactive	Retention Basin	207-U, 207-U, Retention Basin	T Plant Area	Retention Basin	N	N	0	302o1.0	2 4o.0	123.0	o.5	0-8	Interim stabilization consisted of consolidating (scraping and moving) some of the contaminated soil on the east side of the basin with the soil closer to the basin perimeter. Prior to interim stabilization of the 207-U Basin, the perimeter area of the basin was posted as a CA. One area in the southwest corner was posted as URM for unknown reasons. As part of the same stabilization effort and to prepare the area for stabilization, the area was policed and small pieces of debris, old signs, and other waste materials were picked up, and the old signs referring to UO3 Plant were removed. Most of the polyvinyl chloride and rubber pipe and fittings were surveyed and removed from the area. The wood and smaller nonreleasable debris were placed into a burial box for disposal. The abandoned power poles and wire were verified as not energized, were taken down, surveyed, and removed from the area. Nine soil samples were collected from the scraped area (the area that was downposted, and not from the other areas of the project) and analyzed. Based on the sample results and a surface radiological survey, the scraped area was released from radiological control. The contaminated soil was covered with clean dirt and reposted as a URM. The interior of the basin remains posted as a CA. The stabilized area has been revegetated with wheatgrass. GPS was performed to record the new site boundaries and posting.	Chemical sewer waste cooling water stormwater runoff	Liquid	Unk.	Unk.

Table B-1. Waste Site Attributes.

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Physical Setting	Back-fill (Y/N)	Surface Cover Present (Y/N)	Surface Cover Thickness (ft)	Site Area (ft^2)	Site Length (ft)	Site Width (ft)	Site Depth (ft)	Potential Cont. Interval (ft)	Prior Cleanup Activities	Release Mechanism	Release Type (Solid and/or Liquid)	Potential Constituents	
																	Radioactive	Nonradioactive
207-Z	Inactive	Retention Basin	207-Z, 207-Z Retention Basin, 241-Z Retention Basin, 241-Z-RB	PFP Area	Retention Basin	Y	N	0	2000.0	50.0	40.0	10.0	0-15 (spotty)	Concrete basin filled with high-density grout.	Steam condensate/ cooling water	Liquid	Unk.	Unk.
216-S-12	Inactive	Trench	216-S-12, UPR-200-W-30, 291-S Stack Wash Sump, REDOX Stack Flush Trench	REDOX Area	Trench	Y	N	0	1800.0	90.0	20.0	10.0	10-15	The site was deactivated by removing the temporary above-ground piping and backfilling the trench.	Flush water	Liquid	5 curies of beta particle emitters and 2-3 curies of gamma emitters, that were predominantly ruthenium and zirconium-niobium. Co-60, Sr-90, Cs-137, Pu-239/240, U-238 in May 1987.	600 kg ammonium nitrate
216-S-18	Inactive	Trench	216-S-18, 241-SX Steam Cleaning Pit, 216-S-14 Steam Cleaning Pit	S/U Farm Area	Trench	Y	Y	1-2	2000.0	125.0	16.0	6.0	0-15	The area has been surface stabilized. Contaminated soil was covered with 1.83 m of clean backfill and posted URM.	Steam condensate/ contaminated soil	Solid and liquid	Unk.	Unk.
216-T-10	Inactive	Trench	216-T-10, Decontamination Trenches, Equipment Decontamination Area	T Plant Area	Trench	Y	N	0	500.0	50.0	10.0	7.0	7-10	In May 1972, the site was exhumed. All contamination (max 3000 cpm) was removed. All contamination (maximum 3000 cpm) was taken to the 200 West Area Dry Waste Burial Ground. The 216-T-9, 216-T-10 and 216-T-11 Trenches were then released from radiation zone status.	Vehicle decontamination waste	Liquid	Unk.	Unk.
216-T-11	Inactive	Trench	216-T-11, Decontamination Trenches, Equipment Decontamination Area	T Plant Area	Trench	Y	N	0	500.0	50.0	10.0	7.0	7-10	In May 1972, the site was exhumed. All contamination (maximum 3000 cpm) was taken to the 200 West Area Dry Waste Burial Ground. The 216-T-9, 216-T-10 and 216-T-11 Trenches were then released from radiation zone status.	Vehicle decontamination waste	Liquid	Unk.	Unk.
216-T-12	Inactive	Trench	216-T-12, 207-T Sludge Grave, 207-T Sludge Pit, 216-T-11	T Farm Area	Trench	Y	N	0	150.0	15.0	10.0	8.0	0-15	Site was backfilled with clean soil and posted with "URM" sign. The 207-T Retention Basin was backfilled with dirt in 1996. The basin and the area surrounding the basin (where 216-T-12 was located) has been covered with clean dirt and posted with URM signs.	Contaminated sludge	Solid and liqud	Up to 0.015 rad/h in 1954.	Unk.
216-T-13	Inactive	Trench	216-T-13, 269-W Regulated Garage, 269-W Decontamination Pit or Trench, 216-T-12, 269-W Regulated Garage Decontamination Pit	T Farm Area	Trench	Y	N	0	400.0	20.0	20.0	10.0	10-11	The site was radioactive, but was excavated in April 1972. Approximately 3.06 m^3 (4 yd^3) of soil was found to be contaminated with levels of 1500 cpm. The contaminated soil was removed and taken to the 200 West Area Dry Waste Burial Ground. The site was then removed from radiological control. Two characterization test pits were dug, to a depth of approximately 25 ft in April 2005.	Vehicle decontamination waste	Liquid	None	None

Table B-1. Waste Site Attributes.

Waste Site Code	Current Status	Waste Site Type	Waste Site Name	Facility Area	Physical Setting	Back-fill (Y/N)	Surface Cover Present (Y/N)	Surface Cover Thickness (ft)	Site Area (ft^2)	Site Length (ft)	Site Width (ft)	Site Depth (ft)	Potential Cont. Interval (ft)	Prior Cleanup Activities	Release Mechanism	Release Type (Solid and/or Liquid)	Potential Constituents	
																	Radioactive	Nonradioactive
216-T-9	Inactive	Trench	216-T-9, Decontamination Trenches, Equipment Decontamination Area	T Plant Area	Trench	Y	N	0	500.0	50.0	10.0	7.0	7-10	In May 1972, the site was exhumed. All contamination (maximum 3000 cpm) was taken to the 200 West Area Dry waste Burial Ground. The 216-T-9, 216-T-10 and 216-T-11 Trenches were then released from radiation zone status.	Vehicle decontamination waste	Liquid	None	Unk.
UPR-200-E-17	Inactive	Unplanned Release	UPR-200-E-17, Overflow at 216-A-22, UN-200-E-17	PUREX Area	Crib	N	Y	1-2	Unk.	Irr.	Irr.	Unk.	2-6	In 1950, the area was covered with dirt. It was not separately marked because it was located within the 205-A diamed radiation zone.	Leak/spill	Liquid	Unk.	460,000 L uranyl nitrate hexahydrate
UPR-200-E-9	Inactive	Unplanned Release	UPR-200-E-9, Liquid Overflow at 216-BY-201, UN-200-E-9	B Farm Area	Outlying Area	N	Y	1-2	Unk.	Irr.	Irr.	Unk.	0-3	In 1955, most of the contaminated soil was moved to a site south of 216-B-43 and covered with 0.6 m (2 ft) of clean soil. The contamination left near the flush tank was covered with 3 m (10 ft) of clean soil. Contamination scraped, then surveyed and released; a large Surface Contamination Area had been posted north of 241-BY Tank Farm (UPR-200-E-89). In 1991, it was scraped and the contaminated soil consolidated onto the 216-B-43 through 216-B-50 Cribs. The contamination was covered with clean dirt. The scraped areas were surveyed and released.	Leak/spill	Liquid	Unk.	Supernatant waste from the tributyl phosphate 41,600 L tributyl phosphate process waste (before cleanup)
UPR-200-W-103	Inactive	Unplanned Release	UPR-200-W-103, 216-Z-18 Line Break, UN-216-W-13, UN-200-W-103, Pipe Line Leak	PFP Area	Outlying Area	Y	N	0	150.0	25.0	6.0	7.0	7-15	An area measuring 7.6 m (25 ft) long, 1.8 m wide (6 ft), and 2.1 m (7 ft) was excavated around the line leak. Approximately one hundred 55-gal barrels of contaminated soil were removed and buried in the 200 West Area Plutonium "Storage for Recovery" Burial Ground. Gross alpha contamination in excess of 6 million dpm was identified. A considerable amount of contaminated soil still remained in the excavation after it was backfilled. The excavation was to 2.1 m depth, after it was backfilled. Contaminated soil still remains.	Pipeline release	Liquid	16 g of plutonium with gross alpha contamination in April 1979, greater than 6,000,000 dpm.	Unk.
UPR-200-W-111	Inactive	Unplanned Release	UPR-200-W-111, Sludge Trench at 207-U, UN-216-W-21	T Plant Area	Trench	N	Y	1-2	600.0	40.0	15.0	10.0	0-15	The site was surface stabilized in 1997.	Dumping area	Solid	Unk.	Unk.
UPR-200-W-112	Inactive	Unplanned Release	UPR-200-W-112, Sludge Trench at 207-U, UN-216-W-22	T Plant Area	Retention Basin	N	Y	1-2	600.0	40.0	15.0	10.0	0-15	The site was surface stabilized in 1997.	Dumping area	Solid	Unk.	Unk.

NOTE: "Backfill" is defined as soil being replaced inside a waste site to refill it to grade; however, this action is not associated with construction (e.g., cribs being backfilled with gravel) of the waste site.
"Surface Cover Present" is defined as soils that were added to a waste site above grade. The column entitled "Surface Cover Thickness" is used only when a "Y" appears in the column entitled "Surface Cover Present."

BHI = Bechtel Hanford, Inc.
CA = contaminated area.
Cont. = contaminant.
cpm = counts per minute.
DOE-RL = U.S. Department of Energy, Richland Operations Office.
dpm = disintegrations per minute.
GEA = gamma energy analysis.
GPS = Global Positioning System.
HEPA = high-efficiency particulate air.
PFP = Plutonium Finishing Plant.
PUREX = Plutonium-Uranium Extraction (Plant or process).
REDOX = Reduction-Oxidation (Plant or process).
SCA = surface contaminated area.
UNH = uranyl nitrate hexahydrate.
Unk. = unknown.
URM = underground radioactive material.
VCP = vitrified clay pipe.
WHC = Westinghouse Hanford Company.
WIDS = Waste Information Data System.

Appendix C

Applicable or Relevant and Appropriate Requirements

This page intentionally left blank.

Terms

ALARA	as low as reasonably achievable
ARAR	applicable or relevant and appropriate requirement
CERCLA	*Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR	*Code of Federal Regulations*
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
ERDF	Environmental Restoration Disposal Facility
NEPA	*National Environmental Policy Act of 1969*
OU	operable unit
PCB	polychlorinated biphenyl
RCRA	*Resource Conservation and Recovery Act of 1976*
T-BACT	toxics – best available control technology
TSCA	*Toxic Substances Control Act of 1976*
WAC	*Washington Administrative Code*

This page intentionally left blank.

C1 Identification of Applicable or Relevant and Appropriate Requirements for the 200-MG-2 Operable Unit

This appendix identifies the applicable or relevant and appropriate requirements (ARAR) for the 200-MG-2 Operable Unit (OU) removal action.

C1.1 Compliance with ARARS

For a site where material will remain on-site after completion of a *Comprehensive Environmental Response, Compensation, and Liability Act of 1980* (CERCLA) action, the level or standard of control that must be met for the hazardous substance, pollutant, or contaminant is at least that of any applicable or relevant and appropriate standard, requirement, criteria, or limitation under any federal environmental law, or any more stringent standard, requirement, criteria, or limitation promulgated pursuant to a state environmental statute. An applicable requirement is one with which a private party must comply by law if the same action was being undertaken apart from CERCLA authority. All jurisdictional prerequisites of the requirement must be met for the requirement to be applicable. A requirement that is relevant and appropriate may "miss" one or more jurisdictional prerequisites for applicability, but still make sense at the site, given the circumstances of the site and release.

Removal actions conducted onsite are required to comply with the substantive aspects of ARARs to the extent practicable, not with corresponding administrative requirements. That is permit applications and other administrative procedures, such as administrative reviews and reporting and recordkeeping requirements, are considered administrative for actions conducted entirely onsite (40 CFR 300.400[e], "Permit Requirements") and therefore not required.

For the removal action being considered in this document, implementation of the selected alternative will be designed to comply with the ARARs cited in this section to the extent practicable. The ARARs are selected from promulgated environmental regulations that have been evaluated to determine whether they may be pertinent to the removal action. The purpose of this appendix identifies the key ARARs for the actions proposed in the action memorandum.

In addition, ARARs were evaluated to determine if they fall into one of three categories: chemical-specific, location-specific, or action-specific. These categories are defined as follows.

- Chemical-specific requirements are usually health- or risk-based numerical values or methodologies that, when applied to site-specific conditions, result in the establishment of public- and worker-safety levels and site-cleanup levels.
- Location-specific requirements are restrictions placed on the concentration of dangerous substances or the conduct of activities solely because they occur in special geographic areas.
- Action-specific requirements are usually technology- or activity-based requirements or limitations triggered by the removal actions performed at the site.

Federal and state ARARs are presented in Table C-1 and C-2, respectively. The chemical-specific ARARs most relevant to the removal actions in of the 200-MG-2 OU are elements of the Washington State regulations that implement WAC 173-340, "Model Toxics Control Act—Cleanup," specifically associated with developing risk-based concentrations for cleanup (WAC 173-340-745, "Soil Cleanup Standards for Industrial Properties;" WAC 173-340-747, "Deriving Soil Concentrations for Groundwater Protection;" WAC 173-340-720, "Groundwater Cleanup Standards"). The requirements of WAC 173-340-745 help establish soil cleanup standards for nonradioactive contaminants at waste sites. The state air emission standards are likely to be important in identifying air emission limits and control requirements for any

removal actions that produce air emissions. *Resource Conservation and Recovery Act of 1976* (RCRA) land-disposal restrictions will be important standards to follow during the management of wastes generated during removal actions. If soil contamination is deeper than what can be readily excavated, the waste site will be addressed in the final remedy for 200-MG-2 OU (which could include transferring the waste site to another OU) and the requirements of WAC 173-340-720 will be addressed.

C1.2 Waste Management Standards

A variety of waste streams would be generated under the proposed removal actions. A waste management plan will be included in the removal action work plan. It is anticipated that most of the waste will be designated as low-level waste. However, quantities of dangerous or mixed waste, polychlorinated biphenyl (PCB)-contaminated waste, and asbestos and asbestos-containing material also could be generated. The great majority of the waste will be in a solid form. However, some aqueous solutions might be generated (e.g., liquid in railcars).

Radioactive waste is managed by the U.S. Department of Energy under the authority of the *Atomic Energy Act of 1954*.

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, "Dangerous Waste Regulations," has been authorized to implement most elements of the RCRA program. The dangerous waste standards for generation and storage would apply to the management of any dangerous or mixed waste generated at the 200-MG-2 OU waste sites. Treatment standards for dangerous or mixed waste subject to RCRA land-disposal restrictions are specified in WAC 173-303-140, "Land Disposal Restrictions," which incorporates 40 CFR 268, "Land Disposal Restrictions," by reference.

The *Toxic Substances Control Act of 1976* (TSCA), and regulations at 40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions," govern the management and disposal of PCB wastes The TSCA regulations contain specific provisions for PCB waste, including PCB waste that contains a radioactive component. The PCBs also are considered underlying hazardous constituents under RCRA and thus could be subject to WAC 173-303 and 40 CFR 268 requirements.

Removal and disposal of asbestos and asbestos-containing material are regulated under the *Clean Air Act of 1990* and 40 CFR 61, "National Emission Standards for Hazardous Air Pollutants," Subpart M, "National Emission Standards for Asbestos." These regulations provide for special precautions to prevent environmental releases or exposure to personnel of airborne emissions of asbestos fibers during removal actions.

Waste designated as low-level waste that meets the Environmental Restoration Disposal Facility (ERDF) acceptance criteria (WCH-191, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*) is assumed to be disposed at the ERDF, which is engineered to meet appropriate performance standards.

The ERDF is considered to be onsite for management and/or disposal of waste from removal actions proposed in this document. CERCLA Section 104(d)(4) states the following:

> . . . 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." The preamble to 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,

CERLCA Section 104(d)(4) allows the lead agency to treat these related facilities as one for response purposes. This allows the lead agency to manage waste transferred between such noncontiguous facilities without having to obtain a permit. 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 the DOE.

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. In accordance with the ERDF record of decision (EPA/ESD/R10-96/145, *Explanation of Significant Differences: USDOE Environmental Restoration Disposal Facility (ERDF), Hanford Site, Benton County, Washington*), authorization to dispose waste generated during this removal action at the ERDF is granted with the issuance of this action memorandum and through U.S. Environmental Protection Agency (EPA) approval of the sampling and analysis plan. Waste that must be sent offsite will be sent to a facility that has been or could be approved by EPA in accordance with 40 CFR 300.440, "Procedures for Planning and Implementing Off-Site Response Actions," for receiving CERCLA waste.

Waste designated as dangerous or mixed waste would be treated as appropriate to meet land disposal restrictions and ERDF acceptance criteria, and disposed at the ERDF. The 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 record of decision (EPA/ROD/R10-95/100, *Declaration of the Interim Record of Decision for the Environmental Restoration Disposal Facility*) (EPA/AMD/R10-02/030, *Record of Decision Amendment for the Environmental Restoration Disposal Facility*). EPA/ESD/R10-96/145 modified the ERDF record of decision to clarify the eligibility of waste generated during cleanup of the Hanford Site. Per EPA/ESD/R10-96/145, the ERDF is eligible for disposal of any low-level waste, mixed waste, and hazardous/dangerous waste generated as a result of cleanup actions (e.g., removal action waste and investigation-derived waste), provided the waste meets ERDF waste acceptance criteria and appropriate CERCLA decision documents are in place.

Some of the aqueous waste designated as low-level waste, dangerous, or mixed waste would be transported to the Effluent Treatment Facility for treatment and disposal. The Effluent Treatment Facility 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 would be disposed at the ERDF, depending on whether it meets the waste acceptance criteria. The PCB waste that does not meet ERDF waste acceptance criteria would be retained at a PCB storage area that meets the requirements for TSCA storage and would be transported for future disposal at an appropriate disposal facility.

Asbestos and asbestos-containing material would be removed, packaged as appropriate, and disposed in the ERDF.

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

C1.3 Standards Controlling Emissions to the Environment

The proposed removal actions have the potential to generate both radioactive and toxic/criteria airborne emissions. An air monitoring plan will be included in the removal action work plan.

C1.3.1 Radiological Air Emissions

Per RCW 70.94, "Washington Clean Air Act," requires regulation of radioactive air pollutants. The state implementing regulation WAC 173-480, "Ambient Air Quality Standards and Emission Limits for Radionuclides," sets standards that are as stringent or more so than the standards under the Federal *Clean Air Act of 1990* and Amendments, and under the Federal implementing regulation, 40 CFR 61, Subpart H, "National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities." The EPA's partial delegation of the 40 CFR 61 authority to the State of Washington includes all substantive emissions monitoring, abatement, and reporting aspects of the federal regulation. The state standards protect the public by conservatively establishing exposure standards applicable to the maximally exposed public individual. Under WAC 246-247-030(15), "Definitions," the "maximally exposed individual" is any member of the public (real or hypothetical) who abides or resides in an unrestricted area, and may receive the highest total effective dose equivalent from the emission unit(s) under consideration, taking into account all exposure pathways affected by the radioactive air emissions. All combined radionuclide airborne emissions from the DOE Hanford Site "facility" are not to exceed amounts that would cause an exposure to any member of the public of greater than 10 mrem/yr effective dose equivalent. The state implementing regulation WAC 246-247, "Radiation Protection – Air Emissions," which adopts the WAC 173-480 standards, and the 40 CFR 61, Subpart H standard, require verification of compliance with the 10 mrem/yr standard, and potentially would be applicable to the removal action.

The WAC 246-247 further addresses sources emitting radioactive airborne emissions by requiring monitoring of such sources. Such monitoring requires physical measurement (i.e., sampling) of the effluent or ambient air. The substantive provisions of WAC 246-247 requiring the monitoring of radioactive airborne emissions potentially are applicable to the removal action.

The above state implementing regulations further address control of radioactive airborne emissions where economically and technologically feasible (WAC 246-247-040[3] and -040[4], "General Standards," and associated definitions). To address the substantive aspect of these potential requirements, best or reasonably achieved control technology could be addressed by ensuring that applicable emission control technologies (those successfully operated in similar applications) would be used when economically and technologically feasible (i.e., based on cost/benefit). Controls will be administered, as appropriate, using the best methods from among those that are reasonable and effective.

C1.3.2 Criteria/Toxic Air Emissions

Under WAC 173-400, "General Regulations for Air Pollution Sources," and WAC 173-460, "Controls for New Sources of Toxic Air Pollutants," requirements are established for the regulation of emissions of criteria/toxic air pollutants. The primary nonradioactive emissions resulting from this removal action will be fugitive particulate matter. In accordance with WAC 173-400-040, "General Standards for Maximum Emissions," reasonable precautions must be taken to (1) prevent the release of air contaminants associated with fugitive emissions resulting from excavation, materials handling, or other operations and (2) prevent fugitive dust from becoming airborne from fugitive sources of emissions. The use of treatment technologies that would result in emissions of toxic air pollutants that would be subject to the substantive applicable requirements of WAC 173-460 are not anticipated to be a part of this removal action. Treatment of some waste encountered during the removal action may be required to meet ERDF waste

acceptance criteria. In most cases, the type of treatment anticipated would consist of solidification/stabilization techniques such as macroencapsulation or grouting, and WAC 173-460 would not be considered an ARAR. If more aggressive treatment is required that would result in the emission of regulated air pollutants, the substantive requirements of WAC 173-400-113(2), "Requirements for New Sources in Attainment or Unclassifiable Areas," and WAC 173-460-060, "Control Technology Requirements," would be evaluated to determine applicability.

Emissions to the air will be minimized during implementation of the removal action through use of standard industry practices such as the application of water sprays and fixatives. These techniques are considered to be reasonable precautions to control fugitive emissions, as required by the regulatory standards.

Table C-1. Identification of State Applicable or Relevant and Appropriate Requirement for the Removal Action Sites

ARAR Citation	ARAR	Requirement	Rationale for Use
National Archaeological and Historic Preservation Act of 1976, 16 USC 469aa-mm	ARAR	Requires that removal actions at the 200 North Area do not cause the loss of any archaeological or historic data. This act mandates preservation of the data and does not require protection of the actual site.	Archeological and historic sites have been identified within the 100 and 200 Areas; therefore, the substantive requirements of this act are applicable to actions that might disturb these sites.
National Historic Preservation Act of 1966, 16 USC 470, Section 106	ARAR	Requires federal agencies to consider the impacts of their undertaking on cultural properties through identification, evaluation and mitigation processes, and consultation with interested parties.	Cultural and historic sites have been identified within the 100 and 200 Areas; therefore, the substantive requirements of this act are applicable to actions that might disturb these types of sites.
Native American Graves Protection and Repatriation Act, 25 USC 3001, et seq.	ARAR	Establishes federal agency responsibility for discovery of human remains, associated and unassociated funerary objects, sacred objects, and items of cultural patrimony.	Substantive requirements of this act are applicable if remains and sacred objects are found during removal action and will require Native American Tribal consultation in the event of discovery.
Endangered Species Act of 1973, 16 USC 1531 et seq., Subsection 16 USC 1536(c)	ARAR	Prohibits actions by federal agencies that are likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification or critical habitat. If the removal action is within critical habitat or buffer zones surrounding threatened or endangered species, mitigation measures must be taken to protect the resource.	Substantive requirements of this act are applicable if threatened or endangered species are identified in areas where removal actions will occur.

Table C-1. Identification of State Applicable or Relevant and Appropriate Requirement for the Removal Action Sites

ARAR Citation	ARAR	Requirement	Rationale for Use
Toxic Substances Control Act of 1976 **"Polychlorinated 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) "Disposal Requirements," 40 CFR 761.60(a) 40 CFR 761.60(b) 40 CFR 761.60(c) "Remediation Waste," 40 CFR 761.61	ARAR	These regulations establish standards for the storage and disposal of PCB wastes.	The substantive requirements of these regulations are applicable to the storage and disposal of PCB wastes (e.g., liquids, items, remediation waste, and bulk product waste) at $\geq$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). This is a chemical-specific requirement.

CFR = *Code of Federal Regulations*

Table C-2. Identification of State Applicable or Relevant and Appropriate Requirement for the Removal Action Sites

ARAR Citation	ARAR	Requirement	Rationale for Use
Regulations pursuant to the *Resource Conservation and Recovery Act of 1976* and implemented through WAC 173-303, "Dangerous Waste Regulations"			
"Identifying Solid Waste," WAC 173-303-016 "Recycling Processes Involving Solid Waste," WAC 173-303-017	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. The requirement is action-specific.
"Designation of Dangerous Waste," "Designation Procedures," 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. The requirement is action-specific.

Table C-2. Identification of State Applicable or Relevant and Appropriate Requirement for the Removal Action Sites

ARAR Citation	ARAR	Requirement	Rationale for Use
"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-MG-2 OU, should wastes identified in WAC 173-303-071 be encountered. The requirement is action-specific.
"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. The requirement is action-specific.
"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. The requirement is action-specific.
"Recycled, Reclaimed, and Recovered Wastes," WAC 173-303-120	ARAR	Provides for management of certain recyclable materials.	Recycled, reclaimed, and recovered wastes may be generated during the removal action.
"Land Disposal Restrictions," WAC 173-303-140	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. The requirement is action-specific.

Table C-2. Identification of State Applicable or Relevant and Appropriate Requirement for the Removal Action Sites

ARAR Citation	ARAR	Requirement	Rationale for Use
"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 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. The requirement is action-specific.
"Corrective action, Requirements," WAC 173-303-64620(4)	ARAR	Established the requirements to meet RCRA corrective action.	Substantive requirements of these regulations are applicable to show consistency between the removal action and RCRA corrective action requirements. This requirement is action and location-specific.
"Model Toxics Control Act—Cleanup," WAC 173-340			
"Soil Cleanup Standards for Industrial Properties," WAC 173-340-745 "Deriving Soil Concentrations for Groundwater Protection," WAC 173-340-747 "Groundwater Cleanup Standards," WAC 173-340-720 "Terrestrial Ecological Evaluation Procedures," WAC 173-340-7490 "Tables," WAC 173-340-900, Table 749-3	ARAR	Use of Method C equations (WAC 173-340-745, -747, and -720) used to evaluate risk and calculate chemical cleanup levels for noncarcinogens and carcinogens.	The substantive requirements of the specified subsections used to develop cleanup standards for the selected removal action for the 200-MG-2 OU. This is a chemical-specific requirement.

Table C-2. Identification of State Applicable or Relevant and Appropriate Requirement for the Removal Action Sites

ARAR Citation	ARAR	Requirement	Rationale for Use
"General Regulations for Air Pollution Source," WAC 173-460			
"Washington Clean Air Act," RCW 70.94 State Government – Executive," "Department of Ecology," RCW 43.21A "General Regulations for Air Pollution – Sources," WAC 173-400 Specific Subsections: WAC 173-400-040	ARAR	Requires all sources of air contaminants to meet standards for visible emissions, fallout, fugitive emissions, odors, emissions detrimental to persons or property, sulfur dioxide, concealment and masking, and fugitive dust. Requires use of reasonably available control technology.	Substantive requirements of the general standards for control of fugitive emissions are applicable to removal actions at the site because of the generation of fugitive dust that occurs during excavation or other types of construction activities. The requirement is action-specific.
Specific subsections: WAC 173-400-060, "Emission Standards for General Process Units" WAC 173-400-075, "Emission Standards for Sources Emitting Hazardous Air Pollutants"	ARAR	Requires specifically identified types of emission sources to meet standards beyond the general emission standards imposed by WAC 173-400-040. Incorporates the applicable federal requirements from 40 CFR 60 and 40 CFR 63. Requires use of either reasonably available control technology, best available control technology, or maximum achievable control technology, depending on the specific type of emission source.	The selected alternative may include or result in one or more defined types of emission sources that would need to be controlled in accordance with these requirements. The requirement is action-specific.
Specific subsection: WAC 173-400-113	ARAR	incorporates by reference the applicable federal requirements from 40 CFR 60 (new source performance standards), 40 CFR 61 (national emission standards for hazardous air pollutants), and 40 CFR 63 (minimum available control technology). Requires controls to minimize the release of air contaminants from new or modified sources of regulated criteria and toxic air emissions. Emissions are to be minimized through application of best available control technology.	Substantive requirements of this regulation would be applicable to removal actions performed at the site if a treatment technology that emits regulated air emissions were necessary during the implementation of the removal action. The requirement is action-specific.
"Controls for New Sources of Toxic Air Pollutants," WAC 173-460			
"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 WAC 173-460-080 WAC 173-460-150	ARAR	Requires best available control technology for regulated emissions of toxic air pollutants (T-BACT) and demonstration that emissions of toxic air pollutants will not endanger human health or safety.	Substantive requirements of these regulations applicable to removal actions performed at the site, if a treatment technology that emits toxic air emissions were necessary during the implementation of the removal action. The requirement is action-specific.

Table C-2. Identification of State Applicable or Relevant and Appropriate Requirement for the Removal Action Sites

ARAR Citation	ARAR	Requirement	Rationale for Use
"Asbestos" *Benton Clean Air Authority*, 2005, Regulation 1, Article 8			
Section 8.02, "CFR Adoption by Reference;" Section 8.03, "General Requirements"	ARAR	Incorporates the federal requirements of 40 CFR 61, Subpart M. Requires established controls and work practices for managing and disposing regulated asbestos-containing material.	The removal action may include the removal or disturbance of regulated asbestos containing material that must be conducted in accordance with the applicable requirements and work practices. The requirement is action-specific.
"Radiation Protection -- Air Emissions," WAC 246-247			
"National Standards Adopted by Reference for Sources of Radionuclide Emissions," WAC 246-247-035(1)(a)(ii)	ARAR	Establishes requirements equivalent to 40 CFR 61, Subpart H, by reference. Radionuclide airborne emissions from the waste site shall be controlled so as not to exceed amounts that would cause an exposure to any member of the public of greater than 10 mrem/yr effective dose equivalent.	Substantive requirements of this standard are applicable because this removal action may include activities such as excavation, demolition, decontamination, and stabilization of contaminated areas and equipment, 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. The requirement is action-specific.
"General Standards," WAC 246-247-040(3) WAC 246-247-040(4)	ARAR	Emissions shall be controlled to ensure that emission standards are not exceeded. Actions creating new sources or significantly modified sources shall apply best available controls. All other actions shall apply reasonably achievable controls.	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 demolition and excavation of contaminated soils and operation of exhausters and vacuums, performed during the removal action. This standard ensures compliance with emission standards. The requirement is action-specific.

Table C-2. Identification of State Applicable or Relevant and Appropriate Requirement for the Removal Action Sites

ARAR Citation	ARAR	Requirement	Rationale for Use
"Monitoring, Testing, and Quality Assurance, "WAC 246-247-075(1), –(2), and –(4)	ARAR	Establishes the monitoring, testing, and quality assurance requirements for radioactive air emissions from major sources. Effluent flow rate measurements shall be made and the effluent stream shall be directly monitored continuously with an in-line detector or representative samples of the effluent stream shall be withdrawn continuously from the sampling site following the specified guidance. The requirements for continuous sampling are applicable to batch processes when the unit is in operation. Periodic sampling (grab samples) may be used only with lead agency prior approval. Such approval may be granted in cases where continuous sampling is not practical and radionuclide emission rates are relatively constant. In such cases, grab samples shall be collected with sufficient frequency to provide a representative sample of the emissions. When it is impractical to measure the effluent flow rate at a source in accordance with the requirements or to monitor or sample an effluent stream at a source in accordance with the site selection and sample extraction requirements, the waste site owner or operator may use alternative effluent flow rate measurement procedures or site selection and sample extraction procedures as approved by the lead agency. 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 demolition and excavation of contaminated soils and operation of exhausters and vacuums, performed during the removal action. This standard ensures compliance with emission standards. The requirement is action-specific.
"Monitoring, Testing, and Quality Assurance,"` WAC 246-247-075(3)	ARAR	Methods to implement periodic confirmatory monitoring for minor sources may include estimating the emissions or other methods as approved by the lead agency.	Fugitive and diffuse emissions from the demolition and excavation and related activities will require periodic confirmatory measurements to verify low emissions. The requirement is action-specific.

Table C-2. Identification of State Applicable or Relevant and Appropriate Requirement for the Removal Action Sites

ARAR Citation	ARAR	Requirement	Rationale for Use
"Monitoring, Testing, and Quality Assurance," WAC 246-247-075(8)	ARAR	Site emissions resulting from nonpoint and fugitive sources of airborne radioactive material shall be measured. Measurement techniques may include ambient air measurements, or in-line radiation detector or withdrawal of representative samples from the effluent stream, or other methods as determined by the lead agency.	Fugitive and diffuse emissions of airborne radioactive material from demolition, excavation, and related activities will require measurement. The requirement is action-specific.
"Ambient Air Quality Standards and Emission Limits for Radionuclides," WAC-173-480			
"General Standards for Maximum Permissible Emissions," WAC 173-480-050(1)		At a minimum, all emission units shall make every reasonable effort to maintain radioactive materials in effluents to unrestricted areas, ALARA. Control equipment of sites operating under ALARA shall be defined as reasonably available control technology and as low as reasonably achievable control technology.	The potential for fugitive and diffuse emissions from demolition, excavation, and related activities will require efforts to minimize those emissions. The requirement is action-specific.
"Emission Monitoring and Compliance Procedures," WAC 173-480-070-(2)		Determine compliance with the public dose standard by calculating exposure at the point of maximum annual air concentration in an unrestricted area where any member of the public may be.	Fugitive and diffuse emissions from demolition, excavation, and related activities will require assessment and reporting. The requirement is action-specific.

ALARA = as low as reasonably achievable
CERCLA = *Comprehensive Environmental Response, Compensation, and Liability Act of 1980*
CFR = *Code of Federal Regulations*
RCRA = *Resource Conservation and Recovery Act of 1976*
T-BACT = toxics – best available control technology
WAC = *Washington Administrative Code*

C2 National Environmental Policy Act

This action memorandum documents approval of a DOE non-time-critical removal action to cleanup 34 waste sites in the 200-MG-2 OU. These waste sites were evaluated for cleanup under the 200-MG-2 OU engineering evaluation/cost analysis (EE/CA) (DOE/RL-2008-45, *Engineering Evaluation/Cost Analysis for the 200-MG-2 Operable Unit Waste Sites*). Sixteen of these waste sites, comprising an area of approximately 0.24 ha (0.6 a) are expected to be removed under Alternative 2, Confirmation sampling/no further action and 18 of these waste sites comprising an area of approximately 1.62 ha (4.0 a), are expect to be removed under Alternative 3, removal, treatment, and disposal.

Under the *National Environmental Policy Act of 1969* (NEPA) compliance program (DOE O 451.1B, Section 5.a.(13)), DOE will "...incorporate NEPA values, such as analysis of cumulative, off/-site, ecological, and socioeconomic impacts, to the extent practicable, in DOE documents prepared under the Comprehensive Environmental Response, Compensation, and Liability Act." NEPA values associated with cleanup of the 34 waste sites were generally summarized in Section 5.5 of the 200-MG-2 OU EE/CA. The aforementioned NEPA values were based on considering the more detailed information presented in the 200-MG-2 OU EE/CA CERCLA Evaluation Criteria, the 200-MG-2 OU EE/CA discussion of the specific site characteristics (Section 2.3), contaminants of potential concern (Section 2.4), and alternative removal actions (Sections 4.0 and 5.0). Applying a "sliding scale" of NEPA analysis to the 200-MG-2 OU (using DOE, 2004, *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements*), and considering the CERCLA ARARs (detailed in Appendix C of the 200-MG-2 OU EE/CA), the principle resource areas of concern include the contaminants in the soils, solid and liquid radioactive and hazardous waste management, air emissions, potential adverse effects to historic and cultural resources, ecological resources, socioeconomics (including environmental justice concerns), and transportation.

For purposes of implementing the preferred removal actions, when soils at a site in this OU are found to be contaminated with hazardous substances in concentrations presenting a material threat to human health and the environment, that threat will be mitigated by meeting the applicable ARAR standards as well as following current DOE policy and guidance. The net anticipated effect could be a positive contribution to cumulative environmental effects at the Hanford Site through removal, treatment and disposal of such hazardous substances and contaminants of concern into a facility that has been designed and legally authorized to safely contain such contaminants. Wastes generated during the proposed activities would be manageable within the capacities of existing facilities. DOE expects that the primary facility to receive contaminated soils will be the ERDF. NEPA values in the planning for the ERDF operation were explained in detail in the original ERDF NEPA Roadmap, DOE/RL-94-41, *NEPA Roadmap for ERDF Regulatory Package,* for the ERDF remedial investigation/feasibility study (DOE/RL-93-99, *Remedial Investigation and Feasibility Study Report for the Environmental Restoration Disposal Facility*) as described in EPA, 2007, *U.S. Department of Energy Environmental Restoration Disposal Facility Hanford Site – 100 Area Benton County, Washington.*

The NEPA values most relevant to and potentially affected by the actions taken place under this removal action are described in the Table C-3.

Table C-3. NEPA Values Evaluation

NEPA Values	Description	Evaluation (Includes the Evaluation for Each Alternative)
Transportation	Considers impacts of the proposed action on local traffic (i.e., traffic at the Hanford Site) and traffic in the surrounding region	Implementation of Alternative 2 and 3 would be expected to produce short term impacts on local traffic. A majority of the impact is associated with increased truck traffic associated with Alternative 3, removal, treatment, and disposal, as contaminated soil is moved from a waste site(s) to the ERDF. Transportation impacts were considered in the ERDF remedial investigation/ feasibility study, DOE/RL-93-99, as part of the evaluation of short term effectiveness and implementability. NEPA values in the planning for the ERDF operation were explained in detail in the ERDF NEPA Roadmap, DOE/RL-94-41. Transportation associated with a waste site for sampling under Alternative 2, Confirmation sampling/no further action, is considerably smaller than for Alternative 3, since there are no trips to the ERDF. See the discussion of cumulative impacts for a perspective of transportation to the ERDF.
Air Quality	Considers potential air quality concerns associated with emissions generated during the proposed action	Airborne releases associated with Alternative 2 and 3, are expected to be minor with the use of appropriate work controls (e.g., sampling during favorable wind conditions, use of dust suppressants). DOE/RL-2008-45, Appendix B, contains the site history for these waste sites. Sixteen of these waste sites, comprising an approximate area of 0.24 ha (0.6 a) are expected to be removed under Alternative 2, Confirmation sampling/no further action and the remaining 18 waste sites comprising approximately 1.62 ha (4.0 a), are expect to be removed under Alternative 3, removal, treatment, and disposal. These waste sites have limited shallow contamination which will have negligible potential to emit hazardous constituents into the air. Any potential of airborne release of contaminants during these removal actions will be controlled in accordance with DOE radiation control and air pollution control standards, to minimize emissions of air pollutants at the Hanford Site, and protect all communities outside the Site boundaries. Operation of trucks and other diesel-powered equipment for these alternatives would be expected, in the short-term, to introduce quantities of sulfur dioxide, nitrogen dioxide, particulates, and other pollutants to the atmosphere, typical of similar-sized construction projects. These releases would not be expected to cause any air-quality standards to be exceeded and (as needed) dust generated during removal activities would be minimized by watering or other dust-control measures. Vehicular and equipment emissions will be controlled and mitigated in compliance with the substantive standards for air quality protection that apply to the Hanford Site.

Table C-3. NEPA Values Evaluation

NEPA Values	Description	Evaluation (Includes the Evaluation for Each Alternative)
Natural, Cultural, and Historical Resources	Considers impacts of the proposed action on wildlife, wildlife habitat, archeological sites and artifacts, and historically significant properties	Impacts on ecological resources in the vicinity of the removal actions will continue to be mitigated in accordance with DOE/RL-96-32 and DOE/RL-96-88, and with the applicable standards of all relevant biological species protection regulations. Because these sites have already been disturbed, and only isolated artifacts could be encountered during project activities, implementation of DOE/RL-98-10 and consultation with area Tribes will help ensure appropriate mitigation to avoid or minimize any adverse cultural or historical resource effects and address any relevant concerns. Impacts to other cultural values will be minimized through implementation of DOE/RL-98-10, DOE/RL-2005-27, and consultation with area Tribes as needed. This will help ensure appropriate mitigation to avoid or minimize any adverse effects to natural and cultural resources and address any other relevant concerns. Potential impacts to cultural and historical resources that may be encountered during the short-term construction activities associated with implementing the removal action will be mitigated through compliance with the appropriate substantive requirements of the *National Historic Preservation Act of 1966* and other ARARs related to cultural preservation.
Socioeconomic Impacts	Considers impacts pertaining to employment, income, other services (e.g., water and power utilities), and the effect of implementation of the proposed action on the availability of services and materials	The proposed action is within the scope of current DOE, Richland Operations Office environmental restoration activities and will have minimal impact on the current availability of services and materials. This work is expected to be accomplished largely using employees from the existing contractor workforce. Even if the removal activities creates additional service sector jobs, the total expected increase in employment would be expected to be less than 1% of the current employment levels at the Hanford Site. The socioeconomic impact of the project will contribute to the continuing overall positive employment and economic impacts on eastern Washington communities from Hanford Site cleanup operations.
Environmental Justice	Considers whether the proposed remedial actions would have inappropriately or disproportionately high and adverse human health or environmental effects on minority or low income populations	Per Executive Order 12898, DOE seeks to ensure that no group of people bears a disproportionate share of negative environmental consequences resulting from proposed federal actions. There are no impacts associated with proposed activities associated with the 200-MG-2 OU that could reasonably be determined to affect any member of the public; therefore, they would not have the potential for high and disproportional adverse impacts on minority or low-income groups.

Table C-3. NEPA Values Evaluation

NEPA Values	Description	Evaluation (Includes the Evaluation for Each Alternative)
Cumulative Impacts (Direct and Indirect)	Considers whether the proposed action could have cumulative impacts on human health or the environment when considered together with other activities locally, at the Hanford Site, or in the region	The concern is associated directly with the targeted area. Because of the temporary nature of the activities and their remote location, cumulative impacts on air quality or noise with other Hanford Site or regional construction and cleanup projects would be minimal. When soils at a site in this operable unit are found to be contaminated with hazardous substances in concentrations presenting a material threat to human health and the environment, that threat will be mitigated. The net anticipated effect could be a positive contribution to cumulative environmental effects at the Hanford Site through removal, treatment, and disposal of such hazardous substances and contaminants of concern into a facility that has been designed and legally authorized to safely contain such contaminants, like the ERDF. The soil removed under Alternative 3 will meet the ERDF waste acceptable criteria as described in WCH-191. The volume of soil that will be generated for disposal during this removal action period could be approximately 22,000 tons over the expected duration of this removal action (the removal action is scheduled for completion in 2024 [see Section 5.7 and Milestone M-15-049B-T01]); this represents less than 2,000 tons per year (and attendant transportation requirements). Wastes generated during the proposed activities would be manageable within the capacities of existing facilities. For perspective, the ERDF received over 700,000 tons of waste in calendar year 2008 and over 430,000 tons in calendar year 2007). Radiological contamination is expected to be minimal; by definition these are waste sites that are believed to be shallow in nature, do not impact groundwater, and have relatively small inventories. The ERDF received approximately 22,500 Ci in calendar year 2008 and approximately 13,000 Ci in calendar year 2007.
Mitigation	Consider whether or not if adverse impacts cannot be avoided, remedial action planning should minimize them to the extent practicable. This value identifies required mitigation activities	Compliance with the substantive requirements of the ARARs will mitigate potential environmental impacts on the natural environment, including migratory birds, endangered species, and soil. DOE has also established policies and procedures for the management of ecological and cultural resources when actions might affect such resources (DOE/RL-96-32; DOE/RL-96-88, and DOE/RL-98-10). Cultural resource and biological species reviews/surveys are undertaken that also provide suggested mitigation activities to assure adverse effects associated with implementing the actions are minimized or avoided. Health and safety procedures, documented in the Health and Safety Plan, established by site contractors would mitigate risks to workers from the removal activities.

Table C-3. NEPA Values Evaluation

NEPA Values	Description	Evaluation (Includes the Evaluation for Each Alternative)
Irreversible and Irretrievable Commitment of Resources	Considers the use of nonrenewable resources for the proposed remedial actions and the effects that resource consumption would have on future generations When a resource (e.g., energy minerals, water, wetland) is used or destroyed and cannot be replaced within a reasonable amount of time, its use is considered irreversible.	Materials that will be used to backfill waste site removed under Alternative 3 will be taken, if needed, from the surrounding area and/or existing borrow pits to contour the backfill to match the surrounding area. For both Alternatives 2 and 3, normal usage of resources during construction activities, such as fuel and water, will be irreversibly used. Restoration of formerly disturbed areas to a more natural state is expected to result in a net benefit to the ecological and visual resources within the region.

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*

DOE/RL-93-99, *Remedial Investigation and Feasibility Study Report for the Environmental Restoration Disposal Facility*

DOE/RL-94-41, *NEPA Roadmap for ERDF Regulatory Package*

DOE/RL-96-32, *Hanford Site Biological Resources Management Plan*

DOE/RL-96-88, *Hanford Site Biological Resources Mitigation Strategy*

DOE/RL-98-10, *Hanford Cultural Resources Management Plan*

DOE/RL-2005-27, *Revised Mitigation Action Plan for Environmental Restoration Disposal Facility*

DOE/RL-2008-45, *Engineering Evaluation/Cost Analysis for the 200-MG-2 Operable Unit*

Executive Order 12580, *Superfund Implementation*

National Environmental Policy Act of 1969

National Historic Preservation Act of 1966

WCH-191, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*

In addition, DOE is including the combined effects anticipated from ongoing CERCLA/ Agreement (Ecology et al., 1989, *Hanford Federal Facility Agreement and Consent Order*) response actions as part of the cumulative impact analysis in the forthcoming draft tank closure and waste management environmental impact statement. The tank closure and waste management environmental impact statement will include a site-wide cumulative impact groundwater analysis. This will present the public with a separate opportunity for comment as part of that NEPA process, and will be used to inform the public concerning ongoing implementing cleanup actions on the Hanford Site.

References

40 CFR 60, "Standards of Performance for New Stationary Sources," *Code of Federal Regulations*. Available at: http://www.epa.gov/lawsregs/search/40cfr.html

40 CFR 61, "National Emission Standards for Hazardous Air Pollutants," *Code of Federal Regulations*. http://www.access.gpo.gov/nara/cfr/waisidx_08/40cfr61_08.html

- 40 CFR 61, Subpart H, "National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities."
- 40 CFR 61, Subpart M, "National Emission Standards for Asbestos."

40 CFR 63, "National Emission Standards for Hazardous Air Pollutants for Source Categories," *Code of Federal Regulations*. http://www.epa.gov/lawsregs/search/40cfr.html

40 CFR 268, "Land Disposal Restrictions," *Code of Federal Regulations*. http://www.access.gpo.gov/nara/cfr/waisidx_08/40cfr268_08.html

40 CFR 300.440, "Procedures for Planning and Implementing Off-Site Response Actions," *Code of Federal Regulations*. http://edocket.access.gpo.gov/cfr_2008/julqtr/40cfr300.440.html

40 CFR 300.400(e), "Permit Requirements," *Code of Federal Regulations*. Available at: http://www.epa.gov/lawsregs/search/40cfr.html

40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions," *Code of Federal Regulations*. http://www.access.gpo.gov/nara/cfr/waisidx_08/40cfr761_08.html

- 40 CFR 761.50(b), "Applicability," "PCB Waste."
- 40 CFR 761.50(c), "Applicability," "Storage for Disposal."
- 40 CFR 761.60, "Disposal Requirements."
- 40 CFR 761.61, "Remediation Waste."

Archaeological and Historic Preservation Act of 1976, 16 USC 469aa-mm, et seq. Available at: http://www.olfeis.com/documents/regulations/ArchaeologicalAndHistoricPreservationActOf1974.pdf

Atomic Energy Act of 1954, 42 USC 2011, et seq. http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0980/ml022200075-vol1.pdf#pagemode=bookmarks&page=14

Benton Clean Air Authority, 2005, Regulation 1, Article 8, Benton County, Washington. Available at: http://www.bcaa.net/RegPol.html

Clean Air Act of 1990, 42 USC 7401, et seq., Pub. L. 101-549. http://www.epa.gov/air/caa/

Comprehensive Environmental Response, Compensation, and Liability Act of 1980, 42 USC 9601, et seq. http://www.epa.gov/oecaagct/lcla.html#Hazardous%20Substance%20Responses

DOE, 2004, *Recommendations for the Preparation of Environmental Assessments and Environmental Impact Statements*, 2nd Edition, U.S. Department of Energy, Office of NEPA Policy and Compliance, Washington, D.C. Available at: www.gc.energy.gov/NEPA/nepa_documents/TOOLS/GUIDANCE/Volume2/2-10-greenbook-recommendations.pdf

DOE O 451.1B, *National Environmental Policy Act Compliance Program*, U.S. Department of Energy, Washington, D.C. Available at: http://www.directives.doe.gov/cgi-bin/explhcgi?qry1145757594;doe-1043

DOE/RL-93-99, 1994, *Remedial Investigation and Feasibility Study Report for the Environmental Restoration Disposal Facility*, Rev. 1, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: http://rrcatalog.pnl.gov/rrcat/query.cfm

DOE/RL-94-41, 1994, *NEPA Roadmap for ERDF Regulatory Package*, U.S. Department of Energy, Washington, D.C. Available at: http://www5.hanford.gov/arpir/?content=detail&AKey=D196074918

DOE/RL-96-32, 1996, *Hanford Site Biological Resources Management Plan,* Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. http://www.pnl.gov/ecomon/Docs/brmap/BRMAP.html

DOE/RL-96-88, 2003, *Hanford Site Biological Resources Mitigation Strategy*, U.S. Department of Energy, Richland Operations Office, Richland, Washington. http://www.pnl.gov/ecomon/Docs/BRMiS.pdf

DOE/RL-98-10, 2003, *Hanford Cultural Resources Management Plan*, Rev. 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: http://rrcatalog.pnl.gov/rrcat/query.cfm

DOE/RL-2005-27, 2005, *Revised Mitigation Action Plan for Environmental Restoration Disposal Facility*, Draft A, U.S. Department of Energy, Richland Operations Office, Richland, Washington. Available at: http://rrcatalog.pnl.gov/rrcat/query.cfm

DOE/RL-2008-45, *Engineering Evaluation/Cost Analysis for the 200-MG-2 Operable Unit Waste Sites*, Revision 0, U.S. Department of Energy, Richland Operations Office, Richland, Washington. http://www5.hanford.gov/arpir/?content=detail&AKey=0906020197

Ecology, EPA, and DOE, 1989a, *Hanford Federal Facility Agreement and Consent Order*, 2 vols., as amended, Washington State Department of Ecology, U.S. Environmental Protection Agency, and U.S. Department of Energy, Olympia, Washington. Available at: http://www.hanford.gov/?page=91&parent=0

Endangered Species Act of 1973, 16 USC 1531, et seq. Available at: http://www4.law.cornell.edu/uscode/16/ch35.html

EPA, 2007, *U.S. Department of Energy Environmental Restoration Disposal Facility Hanford Site – 100 Area Benton County, Washington*, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. Available at: http://yosemite.epa.gov/r10/CLEANUP.NSF/sites/hanford2/$FILE/ERDF-Amended-ROD-2007.pdf

EPA/AMD/R10-02/030, 2002, *Record of Decision Amendment for the Environmental Restoration Disposal Facility*, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. Available at: http://www.epa.gov/superfund/sites/rods/fulltext/a1002030.pdf

EPA/ESD/R10-96/145, 1996, Explanation of Significant Differences: USDOE Environmental Restoration Disposal Facility (ERDF), Hanford Site, Benton County, Washington, Office of Emergency and Remedial Response, Office of Radiation and Indoor Air, U.S. Environmental Protection Agency, Washington, D.C. Available at: http://www.epa.gov/superfund/sites/rods/fulltext/e1096145.pdf

EPA/ROD/R10-95/100, 1995, *Declaration of the Interim Record of Decision for the Environmental Restoration Disposal Facility*, U.S. Environmental Protection Agency, Washington State Department of Ecology, and U.S. Department of Energy, Olympia, Washington. Available at: http://www.epa.gov/superfund/sites/rods/fulltext/r1095100.pdf

Executive Order 12898, 1994, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, William J. Clinton, February 11. Available at: www.dotcr.ost.dot.gov/documents/ycr/eo12898.pdf

National Environmental Policy Act of 1969, 42 USC 4321, et seq. Available at: http://www.nepa.gov/nepa/regs/nepa/nepaeqia.html

National Historic Preservation Act of 1966, 16 USC 470, et seq. Available at: http://www.law.cornell.edu/uscode/16/470.html

Native American Graves Protection and Repatriation Act, 25 USC 3001, et seq. Available at: http://www4.law.cornell.edu/uscode/25/ch32.html

RCW 43.21A, "State Government – Executive," "Department of Ecology," Title 43, Chapter 21A, *Revised Code of Washington*, as amended, Washington State, Olympia, Washington. Available at: http://apps.leg.wa.gov/RCW/dispo.aspx?cite=43

RCW 70.94, "Public Health and Safety," "Washington Clean Air Act," Title 70, Chapter 94, *Revised Code of Washington*, as amended, Washington State, Olympia, Washington. Available at: http://apps.leg.wa.gov/RCW/default.aspx?cite=70.94&full=true.

Resource Conservation and Recovery Act of 1976, 42 USC 6901, et seq. http://www.epa.gov/epawaste/inforesources/online/index.html

Toxic Substances Control Act of 1976, 15 USC 2601, et seq. http://www.epa.gov/lawsregs/laws/tsca.html

WAC 173-303, "Dangerous Waste Regulations," *Washington Administrative Code*, Olympia, Washington. http://apps.leg.wa.gov/WAC/default.aspx?cite=173-303

- 173-303-016, "Identifying Solid Waste."
- 173-303-017, "Recycling Processes Involving Solid Waste."
- 173-303-040, "Definitions."
- 173-303-050, "Department of Ecology Cleanup Authority."
- 173-303-070(3), "Designation of Dangerous Waste," "Designation Procedures."
- 173-303-071, "Excluded Categories of Waste."
- 173-303-073, "Conditional Exclusion of Special Wastes."

- 173-303-077, "Requirements for Universal Waste."
- 173-303-120, "Recycled, Reclaimed and Recovery Waste."
- 173-303-140, "Land Disposal Restrictions."
- 173-303-170, "Requirements for Generators of Dangerous Waste."
- 173-303-200, "Accumulating Dangerous Waste On-Site."
- 173-303-573, "Standards for Universal Waste Management."
- 173-303-630, "Use and Management of Containers."
- 173-303-640, "Tank Systems."
- 173-303-960, "Special Powers and Authorities of the Department."
- 173-303-9907, "Reserved."
- 173-303-64620, "Corrective action," "Requirements."

WAC 173-340, "Model Toxics Control Act -- Cleanup," *Washington Administrative Code*, Olympia, Washington. http://apps.leg.wa.gov/WAC/default.aspx?cite=173-340

- 173-340-720, "Ground Water Cleanup Standards."
- 173-340-745, "Soil Cleanup Standards for Industrial Properties."
- 173-340-747, "Deriving Soil Concentrations for Ground Water Protection."
- 173-340-900, "Tables."
- 173-340-7490, "Terrestrial Ecological Evaluation Procedures."

WAC 173-400, "General Regulations for Air Pollution Sources," *Washington Administrative Code*, Olympia, Washington. http://apps.leg.wa.gov/WAC/default.aspx?cite=173-400

- 173-400-040, "General Standards for Maximum Emissions."
- 173-400-060, "Emission Standards for General Process Units."
- 173-400-075, "Emission Standards for Sources Emitting Hazardous Air Pollutants."
- 173-400-113, "Requirements for New Sources in Attainment or Unclassifiable Areas."

WAC 173-460, "Controls for New Sources of Toxic Air Pollutants," *Washington Administrative Code*, Olympia, Washington. http://apps.leg.wa.gov/WAC/default.aspx?cite=173-460

- 173-460-030, "Requirements, Applicability and Exemptions."
- 173-460-060, "Control Technology Requirements."
- 173-460-070, "Ambient Impact Requirement."
- 173-460-080, "Demonstrating Ambient Impact Compliance."
- 173-460-150, "Class A Toxic Air Pollutants."

WAC 173-480, "Ambient Air Quality Standards and Emission Limits for Radionuclides," *Washington Administrative Code*, Olympia, Washington. http://apps.leg.wa.gov/WAC/default.aspx?cite=173-480

- 173-480-050, "Standards."
- 173-480-070, "Emission Monitoring and Compliance Procedures."

WAC 246-247, "Department of Health," "Radiation Protection - Air Emissions," *Washington Administrative Code*, Olympia, Washington. http://apps.leg.wa.gov/WAC/default.aspx?cite=246-247

- 246-247-030(15), "Definitions."
- 246-247-035(1)(a)(ii), "Radiation Protection -- Air Emissions."
- 246-247-040, "General Standards."
- 246-247-075, "Monitoring, Testing, and Quality Assurance."

WCH-191, 2008, *Environmental Restoration Disposal Facility Waste Acceptance Criteria*, Rev. 0, Washington Closure Hanford, Richland, Washington. Available at: http://www2.hanford.gov/arpir/?content=findpage&AKey=DA05739818

DISTRIBUTION

Onsite

21	U.S. Department of Energy, Richland Operations Office	
	DOE Public Reading Room	H2-53
	F. M Roddy (20)	A6-39
12	CH2M Hill Plateau Remediation Company	
	G. T. Berlin (5)	H8-15
	T. M. Crane	T4-35
	R. E. Day	H8-15
	M. H. Doornbos	H8-15
	J. A. Hulstrom	H8-15
	D. E. McKenney	H8-43
	F. A. Ruck	H8-45
	C. B. Walker	T4-35
2	Mission Support Alliance	
	Document Processing Center	H6-08
	Administrative Record	H6-08
1	Pacific Northwest National Laboratory	
	Hanford Technical Library	P8-55